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YELLOW FEVER

AND

MALARIAL DISEASES

EMBRACING A HISTORY

OF THE

EPIDEMICS OF YELLOW FEVER IN TEXAS;

NEW VIEWS ON ITS DIAGNOSIS, TREATMENT, PROPAGATION AND CONTROL;

DESCRIPTIONS OF

DENGUE, MALARIAL FEVERS, JAUNDICE, THE SPLEEN AND ITS DISEASES, AND DIARRHŒA HEMORRHAGICA; WITH PRACTICAL REMARKS ON THEIR SUCCESSFUL TREATMENT, Etc.

BY GREENSVILLE DOWELL, M. D.,

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To

J. M. TONER, M. D., AND J. M. WOODWORTH, M. D.,

OF

WASHINGTON CITY, D. C.,

This Volume is Inscribed,

AS A

TESTIMONIAL OF THE HIGH ESTEEM AND AFFECTION PERSONALLY ENTERTAINED FOR THEM; AS AN APPRECIATION OF THEIR PROFESSIONAL ATTAINMENTS, AND IN RECOGNITION OF THE FAVORS SHOWN BY FURNISHING BOOKS AND PUBLIC DOCUMENTS, FOR THE COMPILATION OF THIS WORK, TO THEIR FRIEND,

THE AUTHOR.

PREFACE.

This work was undertaken, with the sole object of furnishing to the profession a rational and more definite mode of diagnosis of yellow fever, from the other diseases treated of in it, and to give, as the author believes, a more successful plan of treating that disease. Much that had been prepared for the illustration of the subject of yellow fever has been crowded out by the insertion of matter relating to other diseases, which the author thought would make the main subject plainer, and the book more valuable to the general and professional reader. It is also designed to assist boards of health and health officers, in diagnosing infectious diseases from those that are not infectious, and to be to the practitioner a guide in the critical point of diagnosis; and especially to warn nurses from assuming too much authority, by telling them what they *should do* and what they *should not do*. To the patient it points out the danger of violating the doctor's instructions. The author assumes that yellow fever can be treated successfully, and that the great fear of the disease will be removed by following implicitly the doctor's directions. He warns persons exposed to the disease against all false hopes from the use of *supposed* prophylactics, and relying on quarantines, instead of putting their houses in order to ward off or mitigate the effects of the disease.

To critics, we have to say: We have tried to be as accurate as possible, and to relate facts as they are, however conflicting they may be. Many points in reference to yellow fever are still unsettled, and the author has given the why and wherefore of his belief on every point. When discussing one of these questions on a special occasion, his confrères wished a resolution introduced to ascertain on which side the gentleman was (meaning the author). The prompt reply was, "*on the side of* TRUTH." I never resort to special pleading to prove a theory. I relate facts, regardless of all theory. The seeming want of system must be excused, on the ground of many of the articles having been published before, and to have changed them would have militated against their truthfulness. There are some discrepancies in dates and numbers, which occurred by oversight, as the reports were made at different periods of the epidemics, and by different authors, one giving his opinion and dates, and another a different one; but the table of places, elevation, and mortality, will correct most of these.

Where I have differed from my friends, I have done it alone in the interest of humanity and science, and in no spirit of criticism.

To Messrs. Sinclair & Son, lithographers, North street, Philadelphia, I am indebted for the beautiful map and chromos illustrating the yellow fever zone, and the color of the skin, liver and intestines in extreme cases. The chromos are only designed to show the condition in most fatal cases, and not to guide the mind in the first stages, which must be learned from the symptoms given in the various reports, and the special points dwelt on by the author. To Mr. J. A. Moore, printer, 1220–1224 Sansom street, the author is indebted for the beautiful manner in which he has executed the printing.

INTRODUCTION.

In compiling this little work, I have had in view the false impressions I had obtained from our text-books and the compilations now in publication, which I propose to correct from my personal experience, which is now equal if not superior to any one living in the United States, as I have treated over two thousand cases in hospitals and private practice; and I will refer only to those publications that have corresponded with my experience, to wit: the writings in the *New Orleans Medical Journal*, by Morton Dowler and others, upon its symptoms and treatment; the post-mortems made by Bennet Dowler in the Charity Hospital, Louisiana; Dr. Hertado, of Spain, in Spanish, published in 1822 (the latter, I believe, is the best history, and most correct one on diagnosis I have read up to this day, and corresponds exactly with my own experience); Report of Surgeon General Blair, of the West Indies, during the great epidemic of 1851, '52, '53, and '54, made to the British Admiralty, giving a number of cases treated in the British Navy; number of deaths, and observations on the urine; the pulse, and many post-mortems; showing *that there are no permanent or universal pathological lesions* in yellow fever, and which Bennet Dowler has proved to be true in his investigations. I also wish to correct the error that the *adjective* yellow *attached* to its name has produced, making many believe that all patients turn yellow before or after death, *which is not true, as not more than one in six becomes yellow; and of those who die of black vomit, not more than one in three turns yellow before or after death.* I think the Latin names *febris typhus icterodes* and *febris cum nigro vometo*, much better, as more die of black vomit than any other condition. I also wish to show that the yellowness of the skin is not due to bile, but to the hæmatin of the blood exuded through the capillaries and into intercellular spaces, having more the appearance of yellowness from a contused wound, turning (as such wounds usually do when fatal or about to slough) livid, and even blue-black. When the contusion ends in resolution, or when yellow fever ends in convalescence, the yellowness gets brighter, until the skin gets perfectly clear. I wish to show that dengue is much like a mild case of yellow fever, but the fever lasts longer, and is much higher than yellow fever; but it *never kills*, treat it as you will; while yellow fever is very *fatal*, treat it as you may. Both are epidemics in the Southern States, but the range of dengue seems to be more limited than yellow fever. They do sometimes occur together, but are distinct

diseases, and do not have the relation one to the other that intermittents have to remittents, as one never runs into the other. Both are fevers *sui generis.* Neither occurs outside of settled districts; never found in our worst malarial districts that are sparsely settled, and never occur where intermittents and remittents are most common. Cold below freezing stops both, while intermittents continue indefinitely. No one ever *has a second attack* of either, so far as my observation goes, and I have had an opportunity to see as much of these diseases as any one I know; besides, I have lived thirty years in the Mississippi and Brazos bottoms, practicing in Panola county, Mississippi; Memphis, Tennessee; and Columbia, Brazoria county, Texas; and ten years in public and private hospitals, where all these diseases were common. Hence, I feel confident in speaking and writing as I do. No one is competent to write on yellow fever who has not seen several epidemics, and, at least, several hundred cases. The disease is so protean in its types, and changes so with epidemical influences, that it is congestive one year, sthenic and inflammatory in another, requiring different treatment; and different determinations are to be met, as one year the stomach will be most affected, in another the brain, and another the kidneys. But every epidemic having more or less of these peculiar types requires care and skill in the physician to meet them. Hence, no routine practice can be followed with uniform success, and every case must be treated according to its symptoms and the tendencies of its determination, and to meet these I have reported so many cases, with symptoms and special treatment of each case, giving prescriptions and results.

I have thought best to give an outline of what I wish to establish, before bringing forward the proof; hence, I have given, in a few pages, what I consider as now established, in its history, pathology, and treatment, and then I have given my proofs. The book will be of interest to the non-professional as well as professional readers. The chromos will give a good idea of the color of the skin, in the worst cases as well as the mildest; but the color of the skin is like the pathological lesions, no two exactly alike. The subject of quarantine I have treated fully, believing that much can be done by sanitary measures on shipboard and on land; but exclusion by quarantine I consider impossible.

YELLOW FEVER.

(FEBRIS TYPHUS ICTERODES.)

SYMPTOMS.—This disease usually comes on with slight chilly sensations, often preceded by a few hours or a few days of languor and general malaise.

These chills or rigors last for a few minutes or a few hours, and terminate in a fever, not of a very high grade. Pulse about 100, respiration about 20, and heat about 36 Centigrade, 102 F., acute pain in head, back, and loins. Sometimes vomiting mucus and undigested substances, and when severe, mixed with specks of blood, which is a grave symptom in the first twenty-four hours of the fever.

Patient very *nervous, tremulous, easily excited, startles at any noise.* This is especially so in children; fever continues regularly for twenty-four to sixty-four hours, generally abating in thirty-six hours, when there is a calm; this calm lasts for a few hours or a day, when it terminates in convalescence, or the fever will return. In four or five days, say about the fifth day, patient's eyes will become tinged with yellow, and finally the whole skin will become yellow, like the yellowness of a slight bruise or contusion. *The skin does not turn yellow in more than one case in six, and many die before there is the least appearance of yellowness even in the eyes. Not more than one in three turn yellow that dies of black vomit.*

When there is vomiting and sick stomach from the rise of the fever, the patient is liable, between or after the third day until final recovery, to vomit up specks of blood and mucus, which will become blacker, and finally a blackish brown-red, of the consistency of chocolate or coffee, but free from lumps. This is the pure *vometo prieto* or black vomit, which is the only positive sign of the disease, and I believe it is unlike anything seen in any other pathological condition. I have not seen anything like it in my professional life.*

I have seen, in congestion of the stomach, black matter, sloughs of the mucous coat, and specks of blood, generally with some small green specks. This is common in malarial fevers with congestion of the stomach, and these symptoms may occur in yellow fever, *but the brownish-black semi-fluid effusion in yellow fever is very different.* This effusion may be in small quantities, leaving specks on the handkerchief or on the bed, or it may come up involuntarily, or may be spit up, or there will be pint after pint for hours or even for two or three days. Patient at this stage is very restless, sighs, halloos, screams, attempts to get up, falls about, half conscious, and can't tell why he cannot lie still, nor can he give a reason why he cries out.

Skin begins in this stage to become yellow, if patient does not die in a few hours; first a bright jaundice yellow, then a livid yellow, almost a contused black. In spots over the body, blood will ooze out, nose will bleed; blistered and cupped surfaces will bleed and show no disposition to heal. (See Chromo.)

* This black matter is like the black pigment of the eye.

Urine is generally natural in this stage, will not stain the shirt, as it always does in jaundice. This fact is very important, for this yellowness occurs in hæmaturia miasmatica, and the species of delirium also occurs in that disease, but we very seldom have hemorrhage from the kidneys in yellow fever. Most often there is a suppression of urine, and though it may be scant, it is rarely more yellow than natural.

Black vomit is the last symptom, for the patient generally dies either in a few hours or a few days after throwing it up. The quantity thrown up does not indicate the fatality or hasten dissolution, for only a few mouthfuls seem to be as fatal as bowls full. This black stuff is often found in the bowels when not vomited up, and not more than one in every three that die throw it up. Hence the great difficulty in diagnosing this fever.

I summarize the following symptoms, to be specially noticed in the order I here put them down :—

1. Chill, rigors along the spine.
2. Pain in head, very severe in most bad cases.
3. Fever not very high, tending to perspiration if kept free from a draft.
4. Stage of calm about third day.

Fever lasts but twenty-four hours, at least, in children, and may run on without interruption for at least five days.

5. No second chill unless patient has been subject to intermittent fever, when he will often have regular paroxysms each day, or every other day for three days, when it will assume a typhoid type, with red edges to tongue, dark brown coat in centre, and on the fifth and later there will be more or less dryness and a disposition to crack and bleed. This will be especially the case if patient is kept from water or made to drink hot teas.

Persons Liable to Take the Fever.—Every person is liable to have it who has not had the disease, either old or young, thick or thin, creole or foreign, black or white, and all seem to have it alike. A child six weeks old has it as bad as an octogenarian, and will have black vomit sooner than older persons, as I have seen and known. No acclimation is a preventive, but those who have lived long in a warm climate stand it best, as it is a disease peculiar to warm climates, and those accustomed to high temperature suffer less under the heat of the fever.

No one has a second attack. I believe this to be absolute, as I have not known a single instance. I do not believe moving from a warm climate to a cold one has any influence, for I have known parties to be absent for twenty years and return, live amongst cases and not take it, and this for at least two epidemics. Some may escape that are exposed to several epidemics and then take it, but such cases are very rare; not more than one in twenty will escape, when the disease is in a hospital, hotel, or boarding house, provided they remain during the whole season.

Its Origin.—It came from Africa to America, and is an eruptive or exanthematous fever, infectious or contagious from persons and clothes under certain circumstances not yet well known. (*See article on Quarantine.*)

Varieties.—There are in warm climates three kinds of fever in which the skin turns yellow in certain stages, that are now indigenous in Cuba and other West India Islands and Africa, as—

1. *Malarial Fever.*—Usually called malignant, hemorrhagic, congestive, or

bilious. This is a very dangerous fever, but is not contagious; is not transportable, only in person after infection. Does not infect from person or clothing. Does not terminate in pure black vomit, but often causes sloughs of the stomach with black specks and black vitiated bile. This is the Mauritius yellow fever. Our hæmaturia miasmatica. New Orleans typho-mucous fever.

2. *Hepatitis Acuta.*—Yellow fever of all climates; jaundice with or produced by inflammation of liver, spleen, and bowels. Urine always yellow, stains the bedding, the shirts, and gowns. Slow in its progress; eyes become yellow and remain so for months; when acute, and proves fatal, patient has many symptoms of yellow fever, such as delirium, but more mild and less conscious; does not cry out or wander from bed; generally too weak to get up; always known from yellow fever by the urine, which is tinged from the first, as well as the eyes. Yellow fever patients will, in fifteen or twenty days, if patient live so long, have in some cases jaundice, and may die with all the symptoms as above described, but will generally have black vomit in addition, and will die in screams and cries of an unearthly kind. Patient will generally have strength to get up, and may run off or wander about the house unless watched. If yellow fever terminates thus, there will be the peculiar black vomit.

3. *Infectious Yellow Fever.*—I say this is a fever of one paroxysm, is decreasing and not intermitting. The actual fever ceases between the first twenty-four hours to fifth day. Fever after that date is from its effects; inflammation of brain, stomach, lungs, or liver. No one has a second attack, as stated of this variety, but of the other two varieties of fever mentioned, they are of an enduring proximal type, and though they may be continued, are paroxysmal in their incipiency or decline.

Persons may have many attacks of paludal hemorrhagic character of fever or of the jaundice character, for both are acclimative fevers in warm countries, especially the bilious congestive type.

Mode of Propagating Infectious Yellow Fever.—This form is propagated alone by fomites (germs) or personal contagion, and originates in no other way. These cannot live in a temperature above 212, nor below 32° F., or 100·0 Centigrade, consequently no patient will take the disease where the temperature is below freezing, and you may steam a ship to boiling, and kill out all contagion, and make it clean and healthy, by raising the heat to 212°.

These temperatures have no influence, or but little, over the other two varieties, and persons can take these diseases at a less temperature than freezing and in a ship fumigated to above 212°.

The Cause is not Carried in the Air To any Great Distance.—I have known non-intercourse to prevent it when within half a mile, as occurred on this island in 1864, when the several forts about this city were supplied by wagons taking provisions into a certain line, the drivers changed, and driven into the forts; no case occurred as long as this non-intercourse was kept up; but after a slight frost or two, the men were permitted to come to town, and there occurred several cases and one death in 1865, January 5th.

That the cause is increased by metereological changes of months' duration, I believe, and this is the cause of the belief of some, that it comes in the air. The seasons have been dryer and warmer here that have brought yellow fever. Bayous have dried up each year that we have had the fever, that did not dry up the years

we escaped. But, nevertheless, it is contagious (by transportation to places where these conditions do not exist) in persons and clothing.

Time of Incubation.—Persons generally develop it in from two to nine days, but four is long enough, and I have known persons to have it in or with them permanently twenty-three days before it broke out, as occurred on the revenue cutter, in this port, in 1867. She coaled at the wharf, and five men came into town—first lieutenant, first, second and third engineers and steward. Twenty-three days after leaving the wharf the first lieutenant and first engineer took the fever. The twenty-third the second engineer and steward took it, and the third left for New Orleans, or somewhere north, and did not have it. The first lieutenant and first engineer died; the others recovered. These were treated on board. A crew of thirty-three were sent to the City Hospital, where I had charge, at intervals of seven and nine days, in batches of ten, three and seven in one day, never having been allowed to go to bed on board, and all recovered except one, who relapsed after coming up town and eating condensed milk and apples—giving the same to others, which also caused relapses in several; all recovered except himself. The second lieutenant, left in command, did not go below deck, and stayed both night and day on the upper deck. He alone escaped, of the entire crew.

Mortality.—Unassisted or not treated, about seventy-five per cent. will die, as was the case in the West Indies in ships leaving ports without medicines or doctors.

Well Nursed and Well Treated.—In healthy subjects about five per cent., or one in twenty, will die. Take all cases, including old, young, diseased and broken up constitutions, black and white, almost ten per cent. will die; but sailors and soldiers, well nursed and well treated, not more than one in twenty should die.

But, I regret to state, this is not the report made to our Surgeon General, in 1867; over one in every three died, and in many cases the loss was fifty per cent. But so far as I saw in this city the management was horrid, both in nursing and treatment, after the death of Assistant Surgeon Charles Rowe, until taken charge of by Surgeon Bacon. I attended the Hospital throughout, but could not enforce my rules or have my medicine properly administered after Rowe's death.

Its Importation.—It is my firm belief it does not originate in any territory now belonging to the United States. That it is all winter in the shipping at New Orleans, brought there in vessels from the Islands and South America, there is but little doubt, from the history given of it in New Orleans, and when the city and citizens are in a condition to take it, it breaks out in an epidemic. This it does also in Havana, where it is now indigenous, or may be seen at any season of the year; but Havana has its epidemics, near about as often as New Orleans.

As the children grow up, and the sailors change every three or four years, so the fever occurs every third or fourth year.

It was in the shipping during the war at New Orleans, but as nearly every stranger was kept out of the city, and nearly all the inhabitants left had had the disease, it did not spread. And the sanitary police was so strict, every suspicious case was isolated and the place disinfected. This protected the soldiers from the north, and consequently they did not suffer any more than those in Galveston did that were quarantined.

QUARANTINE—If effectual in persons and ships, will prevent its importation, and prevent it from spreading. But ships in any port after leaving an infected district, especially after having cases on board, will develop it in the warm months if the meteorological condition suits its growth and spread.

In 1866, there were thirteen cases and three deaths in the City Hospital, under my charge; one was taken from the Washington hotel, and another from the city, west of Twenty-fifth street (negro from Mr. McCluskey's). The others were sailors from various ships; five took it in the hospital. One died of black vomit, a patient with consumption; the other deaths occurred from congestion of the liver, caused by the fever. There were no cases in town. The man from the Washington hotel was a waiter and runner for the hotel, and the negro was from the east; New Orleans and Mobile had cases of the fever at that time.

If Galveston had been in a situation to spread the disease, there would certainly have been other cases, as there were cases of all diseases in the Hospital alongside of these, and no one took it out into the city. This makes me declare, there must be some other condition besides mere personal contagion to produce the disease.

PREVENTION.—Much may be done in the way of prevention by sanitary measures.

No animal matter should be allowed to decay in the city limits. Bones, heads of fish, dead chickens, slops from the kitchens, should be removed; all low places where there are worms, bugs and snails, should be filled up or covered with sand until no smell would arise after night or after a rain. This would no doubt prevent its spreading to so great an extent, and would make persons living in the district better prepared to stand the disease when attacked.

Cities once affected with yellow fever, as Philadelphia, New York, Baltimore, Savannah, Charleston and others, have been redeemed from this great scourge by being better drained and better sewered than when it prevailed in them. New Orleans has been greatly improved by its water works, and but for its shipping, lying alongside of the city, I doubt if it would spread there now; its mortality has been greatly reduced since 1853, though the inhabitants have increased.

ISOLATION—Would also prevent its spreading, and when there is a suspicious case reported, no one but nurses and doctors should be admitted, and every room should be well ventilated during the warm sunshine and closed at night and during rainy days. We might thus retard it until winter comes and puts a stop to its progress.

COLD BELOW 32°.—The freezing point has always checked the disease, and if continued long enough for all cases affected to get well, will put a stop to it. A slight frost will check it, but it takes a good freeze to stop it at once. Any change of ten degrees seems to check it for a few days. Hence I believe the *true cause is an animalcule* so small that we have been unable yet to develop it, though there are some efforts being made in that direction which foreshadow success.

PROPHYLAXIS.—The taking of any remedy as a preventive has not proved successful under my observations. I have known quinine tried, but *failed*, only making the case worse when attacked, and one died from tetanus, the result of doses of quinine taken as a preventive, producing paralysis and sloughs resulting in

tetanus and death. Brandy has been given often, always proving injurious, and most cases dying that had resorted to it as a preventive. It greatly deranges the system, and when taken by patients of dissipated habits they are more liable to black vomit, and nearly all suffer from uræmia and yellowness of the skin. Surgeon Warren tried, in the detachment of soldiers at Brenham, Texas, in 1867, emetics of mustard, which appeared to have been successful, and should be tried, as they do but little harm, if any. Charcoal in tablespoonfuls is also reported as efficient.

No one who wishes to avoid this disease should leave their room after nightfall or leave their windows up.

Ice in the room will also have a good effect, and would keep it out if made tight, and ice suspended along or to the ceiling.

There should be no crowding of rooms or places, especially bed rooms.

Woolen clothes should be aired every fair day, and from the top of the house, if possible, or galleries; they should never be put away damp. Woolen clothes should be more carefully and thoroughly washed than even linen or cotton.

Nurses and Nursing.—No nurse should be put in charge of a case that will not follow the directions of the doctor or doctors in attendance. This is a great curse in this city, many taking upon themselves to change their medicines as well as to openly violate the doctor's instructions; *such should always be discharged—the doctor or the nurse should be discharged at once.* There must be no division between these persons, or the patient will most assuredly die. There are so many opinions as to how a patient should be nursed, I will only give my own plan, and what I wish all nurses under my directions to follow; but *one thing all should* remember, to make no change from doctor's directions. It will not do to give plenty of water to one who has been restrained by another nurse. Nor will it do to remove cover from a patient that has been sweating too much, all at once, and the change should alone be made on a doctor's directions. Doors should not be opened that were ordered to be closed, nor windows. All drafts of a sudden character should be strictly avoided—what I think a nurse should do and might do without the instructions of a doctor, *and this is what I recommend.*

When chill comes on patient should be put to bed and *comfortably* covered, not too hot nor too cold, patient's feelings to be duly consulted in this. If patient has eaten only a few minutes, an emetic of ipecac or mustard may be given, to remove all the undigested substances in the stomach, as well as make the patient sweat and stop the chill. If, however, patient has eaten one or two hours before, a dose of castor oil with a little brandy should be given, and repeated if it does not act; to remove all indigestible substances from the intestinal canal, which if left might irritate and cause serious gastric congestion, and finally prepare the way for the black vomit.

If by this time the chill is over, the patient is perspiring moderately, he should be left alone. But if there is a dry skin and thirst, he should have warm teas, orange leaf is perhaps the best, but flaxseed is good, sage is good, and even China tea. This should be taken as freely as patient wants, but should not be forced on him. Feet should also be put in hot mustard bath, and kept in a sufficient length of time to cause perspiration, and then returned to bed and kept free from draft, which I think is always bad at any and all stages of the disease. If patient gets too warm or sweats too profusely, the cover should be partly removed, and if there is pain in the head, with temporal arteries beating, cold cloths should be freely applied, with either nitre or muriate of ammonia in the water, or ice, if deemed necessary, but

these should be used with caution, and when once begun must be continued. I use them but seldom, preferring plain cistern water, which may be discontinued or renewed at the pleasure and desire of the patient.

If patient vomits, no *emetics should be used. No hot teas.* Especially if there be specks of blood in the vomit. Mustard plasters should be put to stomach at once, and ice pounded like snow used if patient desires it, instead of teas.

If the vomiting continues, or the stomach becomes sore, the patient should be cupped at once and freely.

This being done, then for the doctor's prescription: Where the fever appears to run high, and the pain in head and back is great, I give the following :—

℞. Hyd. ch. mitis,
Quinæ sulphatis,
Opii et ipecac pulvis, āā. grs.xij.

F. Charts No 4.
Sig.—One every three hours.

This is repeated as long as the fever lasts, lessening the dose or increasing the length of the intervals, from three to six hours, according to circumstances.

All tendency to congestions is carefully guarded against, and remedies directed to the point; all local pains are at once subdued. These are generally done by mustard plasters, cups, and blisters. If skin is still hot I give tincture of aconite in ten-drop doses, every two or three hours, sometimes using sweet spirits of nitre with aconite. This treatment is continued until the fever subsides and the *stage of calm comes on*, which will be in about thirty-six or fifty-six hours after the fever rises. If patient is much exhausted and pulse feeble, I give brandy toddy, as much as patient wants, but will not force it on him; if there is restlessness, I give valerianate of zinc, in from five to ten-grain doses, as often as necessary. This is better than morphine, but I have used morphine with good results, if patient cannot sleep. If there is retching and vomiting at this stage, I have used, with the best results, the following :—

℞. Brandy, ℥iv
Creasote, ℥j
Morphine, grs.iv. M.

Sig.—Give tablespoonful every three hours, or according to circumstances, in a little water.

I generally put a blister over the stomach, which is generally swollen, sore and tender to the touch at this stage of the disease. Blister is closely watched and cuticle kept on if possible, dressed with glycerin and covered with oil-silk, for they are apt to bleed and will mortify if not well attended too. Should black vomit come in spite of all our efforts to keep it back, I continue the brandy and creasote mixture, and alternate with tincture chloride of iron, in fifteen to thirty drops every two hours, between the brandy, or the solution of the perchloride of iron or tannin, the latter does not corrode. By this treatment twenty-three cases of black vomit recovered under my charge in 1867.

I never give quinine in the stage of calm, or while the fever is off, to a patient with yellow fever; just the reverse of intermittent fever. It chills the patient, makes the skin very cold, and causes a cold, clammy sweat, very weakening to the patient. I allow my patients lemonade, as much as they want, throughout the disease, and this must be closely watched or it will produce serious ptyalism, which should be

avoided. When only partial, it is a good and favorable sign, but if severe, will often prove fatal by producing sloughs and hemorrhages.

Where the kidneys do not act, I use freely sweet spirits of nitre, tincture of buchu, or spirits of turpentine in the usual doses. If a stimulant is necessary in this condition I use gin instead of brandy. Patient should be allowed food whenever called for, which should be light and nutritious, such as beef-tea, tea and coffee, to suit patient's taste; black meats, as pigeons, ducks, ginny chickens, venison, etc., in moderation. Patient must be gently fed when fever goes off, if there is no bad symptoms, or he will sink and the stomach will prey on its own membranes, and nausea and vomiting will follow.

There is no disease that requires as close watching as yellow fever, and none in which judiciously administered medicines do more good. Patient should be watched closely from the stage of calm, or after the fever leaves, until complete reaction is restored, and should not be allowed to get out of bed, if possible, using bed-pan on all occasions. They will faint easily, and to faint is very dangerous at this stage, as the blood is so fibrinated that clots will form in the heart and arteries, and patient die from embolism. Patient must take no unusual exercise for six weeks, or be exposed to damp or wet; must carefully avoid all sudden changes, all mental excitement as well as physical.

Relapses do often occur from very trifling causes, and a relapse is much worse than the original disease, and must be combated with the same remedies, but as a general thing will have to be used in much smaller doses or patient will sink.

I have thus given the plan with which I have treated over two thousand cases, with about twenty-five per cent. loss in hospital, taking all cases as they come, and in private practice about ten. In children about five per cent. In 1867 I treated fifty-nine cases from the time they took their bed until final recovery in the hospital, all grown persons, sailors, and employés, and only lost three—my assistant surgeon, laundress, and one sailor from the revenue cutter, spoken of before. In 1867 I treated forty-two children, and did not lose a single case. (I mean children under twelve years.) Three had black vomit.

QUARANTINE AS A PROTECTIVE MEASURE.

From the map and table given, it will be seen that yellow fever has spread to two hundred and twenty-eight cities and towns, and in twenty-eight States in the United States, appearing seven hundred and forty-one times, and causing 65,311 deaths. In a close analysis of the history of each place and each year, it will be found that it was undoubtedly introduced, at least nineteen times out of twenty; and that it was undoubtedly introduced from Africa to America, is equally proven. That it existed in Africa, Eastern Asia, and Southern Europe, long before the establishment of the Greek and Roman empires, is equally as well established, by Hertado, even running back a'thousand years before Christ, where it was endemic for several thousand years. That it has now become endemic along the coasts of Africa—both east and west—as well as in the West Indies and Northern coast of South America, no one doubts; and that in all these districts it has its epidemic years, and its years of nearly entire exemption, is also well known.

In the United States it will be seen that it has never spread above an elevation of six hundred feet.* Along the sea coasts and islands immediately in the tropics, it has never occurred above three thousand feet, while under the equator it has occurred above four thousand feet. Its history shows that no ship, however filthy, can develop it while it remains out of its endemic or epidemic influence. No heat or moisture can alone produce it, or we would have it as often in the East Indies (where it has never been known to prevail), as in the West Indies, and if the conditions in the East Indies were the same as the West Indies, it would be introduced there, as well as in the West Indies, by ships. Hence there must be some cause, specific and *sui generis*, that produces it. This cause I have *assumed* is animalcular or fungotic (microscopic), and partakes of the nature of the grasshoppers of Egypt and the western prairies, or the smut in cereals; but these are too small to be observed with any instruments we now have, and have so far eluded demonstration; but if we compare the effects of cold and heat on gnats and mosquitoes, it will not be difficult to believe it is of the same nature, as it is controlled by the same natural laws. That it is animalcular and not vegetable is also demonstrated by its occurring in towns and cities, where there is much dead animal matter, and not in the country, where vegetable matter is most abundant. Another proof of its animalcular origin is the fact that in such cities as Boston, New York, Philadelphia, and Baltimore (where it was once so severe), since they have sewers, and have clean, pure water, it never appears now. Hence my belief that it will never be epidemic in New Orleans again, in the sewered part of the city. As proof of this, I will cite that at Vera Cruz, Mexico, it is endemic, and was very fatal at the old fort of San Juan de Ulloa, before the present fort was built and well sewered, but now it never occurs there, nor has it been there since the fort was rebuilt, now over thirty-six years.

* Except Winchester, Va. (See Table.)

Other places of similar history might be cited. In all places where surface drainage is allowed, or open privies, the disease has spread with terrible effect, depopulating some places, as in Buenos Ayres, in South America, a few years since. It will be seen in our report of the fever at Galveston, in 1870, when there were about sixty cases and sixteen deaths, that it was believed to be stopped by excessive dry weather. Again, in 1873, when there were twenty-four cases and seven deaths, that it was prevented by excessive rains every ten days. It was in the city for at least four months, and yet it did not spread. It was in the City Hospital in 1866—twelve cases and one death—and yet it did not spread in the city, although two cases were brought to the hospital from the heart of the city, from Washington Hotel and Church and 26th streets.

It cannot be taken, in a pure air, from persons, clothing, trunks or black vomit; but in an impure air—other things being suitable—it can be taken from *either*. I knew a young lady to sleep in Houston and go to near Hempstead, and take the disease, and die with black vomit, throwing it up on the bed, carpets, and dresses of nurses, and not a soul took it. I knew a gardener to bring vegetables to Galveston, and take the disease down the Island six miles, and die, after turning very yellow, almost livid black, the skin sloughing off in places before he died, and yet his wife and child who stayed in the same room with him—having only one house in the place and one bed—and his doctor (Jennings, living eight miles down the Island), never had it. Yet, when the soldiers left the quarantine forts in 1864, at Galveston, and came to town, and were put in the Quartermaster's department, they took it, there being scarcely a single exemption, while not a case had it in the quarantine forts. Again, I have known a young man leave Houston after it was epidemic, and ride to Huntsville on horseback, and there take it and die; and from him it spread to the entire town. At Calvert, in 1873, a man came from Shreveport, where it was epidemic, and took the disease and died with black vomit; and from him the whole village took it, as will be seen by my report of that epidemic. I could thus name case after case of similar occurrences. Again, many left Galveston and went to interior towns, died, and did not spread the disease—as in report of epidemic of 1867, in Galveston, where a young man left a cabinet shop where there were four cases, and took the disease, and died in San Antonio, with black vomit. San Antonio is high, dry, and well drained, and yellow fever has never spread there. Blair gives an account of an epidemic in Guiana, where, in the shipping in the port nearly every person took it, while in the Hospital, fifteen hundred feet above, neither nurses nor doctors were infected by the patients in the Hospital; but, if nurses were discharged and returned to the port, nearly all took it. These facts demonstrate most positively that there must be some cause that is easily destroyed, and that it cannot affect the human subject except under peculiar circumstances; but it is well known that in any house where there has been a case of black vomit, all the patients will be worse, and where one dies with black vomit, others in the same house are apt to die of it—hence no vomit or stools should be left in the room of a yellow fever patient, and all persons should be removed from the room that have not had the disease.

The facts above given have led many to believe that the person of a yellow fever patient cannot produce it in another, or, in other words, there is no *personal contagion*. In my opinion this is a great *error*, and one that no one should act on. I *know* that the patient spreads the poison from his person. I have seen too many cases tha. have convinced me of this fact. Many young men have gone home to their families

from their rooms with nothing but their wearing apparel on them, and had the disease, and spread it to every one in the house. There are hundreds of such cases. They are usually stripped, and bathed, and put to bed with clean clothes, and their old clothes washed and aired; yet they infect the whole house. I have said, stop a train of cars and strip all clean—put on clean clothes and let them go to a city or town where yellow fever will spread, and they will have the disease and infect the whole place. How can this be unless there is personal infection, as much so as in small-pox? Let no one put his trust in such false hopes. I have stated, *quarantine, to be effective, must be complete, both as to person and goods.* But I do not think this either practicable or possible at the present time in most cities of the United States, as a man may take the seed of the disease in Rio Janeiro, South America, and come to Galveston and pass its quarantine sound and well, and yet have the disease and infect the whole city, for I have seen such cases—as the revenue cutter Delaware, at Galveston, in 1867, where four men came to the city, and eighteen and twenty days afterward these four had the disease, which shows, conclusively, that at least twenty days may intervene before the stage of incubation is over. So you see one may go almost around the world before he would have the disease. Hence I contend for quarantine, for cleanliness, and not for prohibition of ingress and egress, and that we must rely on sanitary means and sanitary measures almost exclusively for our protection from yellow fever. All animal filth should be removed—no open privies should be allowed—in any town or city where yellow fever can prevail. All low places in streets or under houses should be filled up. Better to do it in summer than not at all; but best to be done in winter. For the further discussion of Quarantine we quote from an address by Prof. J. M. Calloway, M. D., before the Galveston Historical Society, which was written at my suggestion, and all of which I endorse, except that part where he says personal contagion cannot take place. This I have fully argued above, and think if I am wrong, it is at least safest to believe in it, and in all cases avoid personal contact with any one after the fever rises and until the fever ceases, and all discharges and clothing have been removed and the room well and completely ventilated or frozen out, and this must be for at least, seven consecutive days—below zero—as it will be seen, from reports, that persons have returned to the city several weeks after a frost and slept in rooms where it has been, and taken the disease and died. No one should return who leaves, until at least four weeks after the last case, or after a seven days' freeze, the thermometer being below zero, Centigrade, at least.

HISTORY OF QUARANTINE AND ITS EFFECTIVENESS.

Of the great majority of diseases of a purely epidemic character, which so often sweep over the earth in their deadly march, rapidly decimating the population of the great emporia of the world, from the rising to the setting sun, even the causes, antecedents or forerunners are wholly unknown, and cannot be determined by pathogenies, consisting of laws enacted from mere theory, discussions, words or resolutions.

Many of the ancients, and moderns too, ascribed epidemics to Divine wrath, to human passions, to astral conjunctions, to earthquakes, etc. Some to saline, sulphurous, alkaline and acidulous matters in the air; to predispositions unknown; while the best of modern meteorologists utterly fail to determine their causes, or point out even the precursors of an epidemic. Terrine, telluric, electric, infusorial,

animalcula, spontaneous epidemics, spontaneous generation, and like theories, each find now but few advocates.

In opposing the rise, extension and decline of these devastating epidemics, we have but one authority, one opponent, one tribunal to which we can appeal for assistance. Science, armed with the facts, data, careful observations and experiences, which she gathers from history, that true logician, stands sentinel at the gate of the great highway which these dark and destructive monsters travel.

The consideration of quarantine is of greater interest, and higher importance to the public, socially, commercially and financially, than any subject pertaining to sanitary science.

In this Republic, and in this age, it is of the utmost importance that the public mind should be enlightened in matters pertaining to sanitary polity; that a firm conviction of the justice, utility, necessity and practicability of laws, should precede the enactment. Otherwise, municipal laws become inoperative, oppressive or mischievous. Many nuisances deleterious to health, and compromising human life, have been denounced *ad infinitum*, ever since the historic era, and even perhaps antedate mummification, monuments and Pharaonic pyramids.

Quarantine is the interdictment or prevention, for a certain period of time, of all communications with individuals, ships or goods arriving from places infected with contagious or infectious diseases, or that are supposed to be peculiarly liable to such infection.

The term is from the Fr. "quarantain;" from the root of L. "quartus," fourth; It. "quarantina," forty; means appropriately, forty days. It being generally supposed that if no infectious disease break out within forty days, or six weeks, no danger need be apprehended from the admission of individuals under quarantine.

During this period all the goods, clothes, baggage, etc., that are supposed to be capable of retaining the contagion, are subjected to a process of disinfection or purification; this last operation, which is the most important part of the quarantine system, is performed on board ship, or in establishments denominated Lazarettoes.

The opinion that the plague was imported from the East into Europe, prevailed, no doubt, in all ages. But the Venetians appear to have been the first to require ships and individuals from suspected places to perform quarantine.

The regulations upon this subject, it is most probable, were first instituted in 1484. (Beekman's History of Inventions, vol. ii. Art Quarantine).

They have since been adopted in every civilized country. In England, though various preventive measures had been previously enacted, quarantine was not systematically enforced, till after the great alarm produced by the plague at Marseilles, in 1720. About the same time, France also adopted her first regular restrictions. By an act of our Congress, passed February 25, 1799, respecting quarantine and health laws, it is provided that quarantine and other restrictions required by the health laws of any State, respecting any vessel arriving in, or bound to any port or district, shall be duly observed by the officers of the Revenue of the United States, and by the masters and crews of the revenue cutters, and by the military officers stationed upon the sea coast; and all such officers of the United States are required faithfully to aid in the execution of such laws.

Here to pass in critical review the different laws and enactments of the nations of Europe, and the several States of our Union, pointing out the deficiencies in their enactment and the imperfection in their enforcement, would be a subject of great interest and importance to every community, legislative body, political econo-

mist and philanthropist; but that would require too great an extension for this paper.

New York was among the first of the States of the Union to establish quarantine. She suffered four epidemics of the yellow fever before, and ten since its establishment, and had an interval of twenty-two years, without yellow fever, and without quarantine.

Philadelphia had quarantine restrictions during all her epidemics.

Boston, though the most favored city on the Atlantic coast, in the United States, regarding yellow fever epidemics, has had the most lax quarantine of any city of its size.

New Orleans established quarantine in 1821, and it was continued five years, during which two epidemics occurred, and in other years it prevailed in sporadic forms. In 1825 quarantine was abandoned and not resumed until 1855, since which time four epidemics have occurred, and it has appeared sporadically every other year up to 1872.

The history of quarantine in Galveston, and on the Texas coast, has been exceedingly difficult to obtain, it having been so imperfect, and of so little importance until the last few years, that our oldest physicians, journalists and citizens, cannot give any positive data connected with local restrictions. In 1850 there was an act passed by the State of Texas, with some quarantine regulations: first restrictions adopted by the city of Galveston, were in 1850, March 31st, and amended August 13th, 1853; and $3000 in bonds of the city were appropriated by the Council, and a quarantine house built at the "point," the east end of the island. There were also some restrictions adopted by the city of Galveston, in 1855.

In October, 1866, quarantine was turned over to the city by the military authorities, which has been annually enforced to the present date, 1876. A general statute was enacted by the State, June 10th, 1870, authorizing quarantine on the coast of Texas, and elsewhere within the State. The prevention of contagious diseases which, from the earliest historic era, have from time to time hovered with their dark and blighting wings, casting a gloomy and fatal pall over communities, has in all ages enlisted the anxious solicitude of the political economist, philanthropist and scientist.

In this connection time will not admit of passing in review the history of cholera, small-pox, typhus, etc.; however, it will be interesting and important to the more full understanding of our subject, that we should give some historic *data*, connected with the great scourge which recently has so often darkened our Southern coast, cities and country, viz.: yellow fever, which seriously affects our social, sanitary, commercial and financial relations.

During this century, the yellow fever element has been so mingled with the great concerns of humanity, that the public mind has been excited to an unexampled degree; in the cabinet and in the field, in the legislative halls and in the medical schools, both at home and abroad, and in the colonial governments.

It has long been the conqueror of armies and navies, and at one time threatened to desolate the peninsula of Europe. It has been the leading topic on which reports, pamphlets, discussions and books have gone forth raging like the epidemic itself.

Affidavits and affronts, certificates and satires, logic and duels, personal contagion and personal invective, bad air and worse legislation, have divided the professional and non-professional public on this great question, which so deeply involves the interest, passions and transactions of humanity.

This dreadful disease prevailed during the eighteenth and the first quarter of the

nineteenth century, in the cities and even small towns of New York, of Pennsylvania and New England. The city of New York has enjoyed such entire exemption since the epidemic of 1822, that it has become a refuge for our unacclimated citizens of Southern cities, during the summer or epidemic months. The fact now seems strange, that the yellow fever is of older date in Northern seaports than in New Orleans, where it has prevailed sixty-three times in the last eighty years. It first appeared in the city in 1796, although it had been of frequent occurrence in insular and Central America, for more than two hundred years before that time.

Yellow fever prevailed in Boston in 1691, 1693, 1695. In New York in 1702, 1743, 1748, 1762, 1793, 1795, 1798. In Philadelphia in 1699, 1732, 1741, 1742, 1743, 1747, 1762, 1793, 1794. In New Haven in 1743, 1794. In Providence, Rhode Island, in 1794. In Norfolk, Va., 1747, 1795, and in Charleston, ten times anterior to its appearance in New Orleans. It visited the Bay of Biloxi, a French military station, ninety miles from New Orleans, in 1702, and Mobile, one hundred and fifty miles to the east, in 1705. It, moreover, has visited Spain in many places where it was unknown before the discovery of America. Cadiz, in 1705, 1731, 1733, 1734, 1744, 1767, as well as other towns in the Mediterranean. It is an interesting fact in connection with the question of its portability, that New Orleans, though closely connected by its geographical position, where yellow fever had prevailed for centuries under Spanish, English and French rule, was yet always exempt up to 1796.

ANOTHER INTERESTING FACT.

From that time to the present, there has never been a year without sporadic cases, when they escaped an epidemic.

The tabular statement of yellow fever in Galveston, with the mortality and population at each period of its occurrence from its first appearance to the present, 1876, is as follows :—

Year.	*When Declared Epidemic.*	*Population.*	*Mortality.*
1839.	September 20.	1,000.	250
1844.	July 5.	6,000.	400
1847.	October 1.	6,000.	200
1853.	August 9.	8,000.	535
1854.	August 4.	8,000.	404
1858.	August 29.	10,000.	873
1859.	September 17.	10,000.	183
1864.	September 1.	5,000.	259
1866.	September 1.	12,000.	3
1867.	July 28.	22,000.	1150
1870.	September 28.	22,500.	16
1873.	September	25,000.	7

In order to comprehend more fully the effectiveness and protection of quarantine, we will give a short synopsis of the nature and character of yellow fever, collated and condensed from the highest and most reliable authorities.

That we may the better understand this part of our subject, we will draw a parallelism, and the contrast with some of the most important contagious and infectious diseases.

Small-pox is intensely contagious, and communicable by inoculation, by fomites, and through the air.

Scarlet fever is inoculable with difficulty, if at all, contagious in a less degree than small-pox, but communicable through the air, and portable by fomites, etc.

In these two diseases, the poison is generated in the system and eliminated in the same form in which it entered.

Marsh malaria fevers are strictly endemic, of local origin, and not contagious or infectious, and not portable.

*Yellow fever, which is not generated in the human system, or transmitted from one person to another in any way, but whose germ or poison is generated outside the human system, and is taken in after the manner of marsh malaria poison.** But unlike the latter, its germ is portable, and may be carried in vessels, trunks, baggage, cars of railroads, etc., from one point to another, and thus propagated.

Yellow fever, like cholera, occasionally leaves its *habitat*, assumes a migratory character, traveling over great extents of country, not unfrequently breaking through the most rigid quarantine.

But in these migrations it seems to have a prescribed course, along which it pays no respect to any impediment placed in its way; but places in its line of travel are often protected by non-intercourse, and hence the importance of quarantine.

From the high authorities of Drs. Warren Stone, J. C. Nott, Hunt, Jones, Fenner, Bennett Dowler, etc.:—These great migrating epidemics revolve in a wave, hurling their terrible influence in a great and sometimes very extended area, often continuing their march during successive years—as the one which commenced in Rio Janeiro, in 1850, and culminated its devastating course at Norfolk, in 1856—putting to flight all theories about local origin, and the protection of sanitary cordons or quarantine restrictions.

As illustrative of the irresistible force with which these great yellow fever epidemics sweep over the country, without regard to topography, sanitary conditions and regulations, I will introduce an extract from the tableau of the epidemic of 1853, by Bennett Dowler, M. D., of New Orleans, whose numerous post-mortem examinations, erudition, observations, experience and knowledge of the history and literature of yellow fever is perhaps unparalleled on this continent. He says: "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, a vast territorial expansion, consisting of alluvial, diluvial, tertiary formations, valleys, dry prairies, elevated plateaus, irregular terraces, low undulating hills, and bluffs, and pine woods, interspersed with bayous, lakes, shallow basins, shaking prairies, large bays, dense cypress swamps, canebrakes, colossal grasses, inundated plains; a vast 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 covers 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 background, bringing detrital matter from the highlands and primitive formations of several mountain chains, with tertiary limestone and coral reefs trending along its eastern portion upon the Floridian peninsula."

"The report on quarantine and yellow fever, by the British government, for 1852,

[*This I do not believe. Strip one with the seeds of the disease in his system, and admit him to a place where the necessary conditions exist, and he will infect the whole place.]

enumerates ninety-six 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 the mountains."

Gibraltar, a compact, gray marble promontory, three miles long, seven in circumference, an area of four hundred acres, covered in few places with earth, rising fifteen hundred feet above the sea, which washes its almost inaccessible walls, having had a population of fifteen thousand, lost out of this number in a few weeks, in 1804, from yellow fever, five thousand seven hundred and thirty-three, or nearly one in five. The disease also visited Gibraltar, in 1813 and 1828.

INCIDENTS, CIRCUMSTANCES, FACTS AND AUTHORITIES REGARDING QUARANTINE.

Dr. Bennett Dowler says: "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 than it did during the Mexican war. In 1846, '47 and '48, 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 contagion through the towns and country.

"In 1848, thousands of returning soldiers passed through Vera Cruz, in June, where the yellow fever existed, and on reaching New Orleans, in July and August, a few died out of the fifteen thousand that remained in the city and its environs, for some time, without communicating any disease to the city by means of their goods, army material and selves.

"Thousands thus, without being 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.

"Thus fifty thousand experiments in Tampico, Vera Cruz and New Orleans, were made, showing that yellow fever did not spread in the absence of quarantine restrictions."

War, with all its evils, contributes in many ways to the advancement of science, and in no country have the officers of the army and navy worked more faithfully than in ours, for its promotion. The history of quarantine during the late war in Southern ports, and statistics of their diseases, have been admirably written and preserved by the United States Medical Officers.

But replete as these documents are with truthful and important facts, I can only pass in short review the quarantine of New Orleans during the war, which is the most important place, regarding our great epidemic scourge, on the American continent, on account of its geographical position as well as because it is the great gateway to a vast extent of country.

General Butler (in the reports to the War Department); Dr. Austin Flint, one of our most distinguished writers on the practice of physic; Dr. Elisha Harris, member of the United States Sanitary Commission during the war, in his able report on the hygiene of New Orleans; and a large number of physicians and others, both North and South, lay great stress upon the rigid military quarantine and sanitary measures in protecting New Orleans against yellow fever from 1862 to 1865.

Yellow fever, like other epidemics, as already seen from the concise history I have given, has its periods of activity and repose.

Our war supervened upon a period of extraordinary activity, and was naturally followed by a corresponding one of inactivity, such as has occurred before, viz.: from 1805 to 1808, 1813 to 1816, 1848 to 1853. To these must be added the three years immediately preceding the war, during the last of which, 1861, immediately preceding its occupation, there was not a single death. The above facts show that New Orleans was more exempt for the three years immediately preceding the war, with all its filth, want of sanitary measures, and absence of quarantine, than will be shown it was during its military occupation, with its "impregnable quarantine," and a policing that made it the "cleanest city on the continent."

In Vera Cruz, the fever, now so prevalent, did not prevail from 1776 to 1794. In Brazil the disease appeared in 1687 and 1690; then we hear nothing more of it in that country until 1849–50, etc. There is not a locality in the tropics where fever does not intermit during periods of greater or less extent.

In the history of Mobile we have an interesting parallel to the history of New Orleans in the yellow fever during the war. Situated one hundred and fifty miles from the latter city, on the coast, and the fever having visited it, as before shown it did New Orleans, and having been a great sufferer during the eighteenth century, there was no epidemic from 1858 to 1867, and not a single case during the entire war, though blockade-runners were coming in every week; and neither before nor after the war was there quarantine deserving the name.

During the war, while Mobile was crowded with troops and war material, sanitary policing was entirely neglected. But there are other points deserving notice in this connection. Dr. Warren Stone says the suburbs of the city were never in a more filthy condition. Dr. Fenner tells us he saw, in July, 1863, one well-marked, fatal case, imported from Key West, and says there were doubtless others, that were ignored for fear of producing a panic among the troops.

In 1863, the civil official records report only two deaths by yellow fever. But Dr. Harris informs us that "nearly one hundred cases of the fever occurred in the river fleet and naval hospital that season." The history of these cases shows none of imported origin. In 1864, official records report six deaths of citizens by yellow fever. Dr. Harris says there were five undoubted fatal cases this year; and over two hundred cases occurred in twenty-five vessels, of which fifty-seven died, notwithstanding the most rigid quarantine against infected vessels. Dr. Fenner, however, says: "In this Dr. Harris was misinformed, and while vessels of war were rigidly quarantined, those of transportation were not, military necessity sometimes requiring their admission at all hazards." From these facts we find that the rigid military discipline did not make quarantine a protection during the war.

One of the most important and interesting circumstances connected with the history of quarantine appeared at Natchez, Miss., in 1854. Having suffered to an extent truly appalling in 1853, the community determined to establish quarantine, which was done, and no doubt as rigidly enforced as human effort would admit. Natchez not only escaped an epidemic, but there was no case officially announced or admitted during that season, and they thought they had found in quarantine a guardian angel for all future time; but the next year, 1855, though the same restrictions were more rigidly enforced than before, Natchez had an epidemic of yellow fever.

In 1867, during the greatest epidemic scourge on the Texas coast, Richmond, on

the Brazos, in the very centre of the epidemic wave in our State, was completely protected by rigid quarantine. In 1856, during the epidemic at Norfolk, Va., Hampton, only fifteen miles distant, and in daily communication, escaped. In Galveston, in 1864, the batteries adjacent to the city were strictly quarantined, and entirely escaped the fever. Three companies stationed at Fort Point, two miles from the city, did not have a single case of sickness from any cause. In 1867, quarantine was in force in Galveston, but communication with Indianola was not obstructed, as the disease was not believed to be yellow fever.

The report of the second Board of Health of England, on quarantine in yellow fever, presented to both Houses of Parliament, in April, 1852, says: "The means of protection from yellow fever is not in quarantine restrictions and sanitary cordons, but in sanitary works and operations. . . . . We believe there is a general belief in the conclusion that the substitution of sanitary hygienic measures for quarantine isolation and restrictions would afford more certain and effectual protection." The Quarantine Convention held in Philadelphia, in May, 1857, was looked to with great interest by both the professional and non-professional public. The purpose for which this learned body was convened was to review the laws of the several States establishing quarantine, with a view of reducing their provisions to some common standard, in accordance with settled medical and scientific opinions.

It was probably not only difficult, but perfectly impossible, that a principle of uniformity was to be made operative in places so unequally situated in relation to the perennial sources of yellow fever as New Orleans and Boston, Galveston and New York, and the great suffering, anxious, and alarmed public were disappointed.

Yellow fever is truly a protean disease. Why it was considered almost entirely a scourge of cities up to 1853, having rarely ever spread in the country before; why up to that time the negro population was nearly exempt, but that it has since attacked large numbers of the same class in the South; why its epidemic wave was of earlier and more frequent occurrence in the Northern seacoast towns than in the Gulf cities during the eighteenth century, and never known south of the equator for the first century of its history, and has prevailed South during the nineteenth century more than North; why at times its phenomena have seemed to prove its nature highly contagious, and at others to wholly disprove its contagiousness; why quarantine has been occasionally effective and at other times useless; why it should prevail extensively in America and tropical Africa, and be unknown in the Indian Ocean and China; why it should be endemic in Vera Cruz and Havana, and never be seen in Calcutta and Bombay—these, and many other interrogatories pertaining to this terrible disease, are doubtful questions, not only in the medical profession but among scientists.

But what shall we say of quarantine regulations and restrictions, established throughout the extended frontier of our country by sea and land; their absurd vacillation, their irrational inconsistency, their notorious inefficiency? Let quarantines be at once abolished, or instituted rationally, and their observance despotically enforced and with the utmost exactness. As to the transmission of contagious disease from one place to another, it is a matter of exceeding difficulty, if not actually impossible, to prevent it, in this period of free intercourse among all nations, for purposes of commerce, pleasure and necessity.

Yet, it is not only the right, but the positive duty of communities and governments to make the attempt, and its success, however partial it may be, abundantly repays all the inconvenience and cost, for human health and life are more valuable than all other possessions. Even if useless as to yellow fever, it will serve to keep out

other diseases equally, if not more, deleterious to our cities and their inhabitants. It may prevent the introduction of diseases known and acknowledged by all to be contagious. It will require vessels to arrive in a more cleanly condition, and thus promote the comfort and salubrity of those whose circumstances, necessities and requirements force them upon the great media of transportation, advancing sanitary science upon the high seas as well as the land. A majority of the most reliable authorities and best intellects of the day are of the opinion that a rigid enforcement of sanitary regulations, with quarantine, which is its most troublesome and expensive measure, might greatly curtail our epidemics.

Quarantine restraints without strict general sanitary measures, even when enforced by the rigid rule of military authorities, as already shown, are not effectual against epidemics; filth, crowding, squalidity, stagnant air and water, produce what was long ago pronounced by Hippocrates "the epidemic constitution of the atmosphere," which is similar to the fertilizing and preparing the soil for the germination of seeds; contagions and infections never spread without a suitable condition of atmosphere; foul air and gases also throw the system out of a healthy equilibrium, and predispose it to morbific influences.

The Quarantine Convention of Philadelphia, in 1857, one of the most able and intelligent bodies ever convened on the American Continent, announced the opinion that, "yellow fever cannot become epidemic or endemic, unless there exist in the community the circumstances which are calculated to produce such diseases independent of the importation."

Already has Peteler, of Staten Island, and Strebe of London, invented an apparatus to reduce the temperature in ships below a freezing point, and thus destroy the infection of yellow fever. Though sanitary science has been of slow growth, and its reforms have lingered and advanced still slower, time, patience, money and intelligence are necessary in securing any important sanitary improvement.

The public mind must be educated as to the necessity and importance of any change in the long-established habits of life and business. Commercial interests reluctantly submit to any restrictions on trade which do not appear to be positively essential to the general welfare; and self-interest is always a powerful element of resistance to all hygienic measures which demand individual expenditures, or modify the usual manner of conducting business pursuits which are liable to become detrimental to the public health; for no sanitary measures, however simple, can be enforced without compelling individuals to yield something of pecuniary interest or of personal convenience to the general welfare.

The great importance and extraordinary benefit of sanitary science, and its relation to the public welfare, can be illustrated by a few striking facts. We have the almost incredible statement, that in the year of our Lord, 545, during the severity of the epidemic, ten thousand people died daily of the plague in the city of Constantinople.

Later, in the year 1345, and the eight succeeding years, this fearful scourge made such destructive ravages in the cities of Europe and the Orient, that it is estimated one-half the then existing population of the globe perished from its terrible fatality. Less than one century and a half ago, of one hundred children born in the city of London, seventy-four died before attaining the age of five years. Sanitary improvements and a more careful attention to the laws of health have reduced this mortality to about thirty deaths to every one hundred children born.

In the single year 1665, more than one hundred thousand people died in the city

of London, or one in every ten of its population. Of this fearful mortality, sixty-three thousand were victims of a single disease—the plague—whose development and ravages can be clearly traced to the filthy and putrescent condition of the great metropolis.

But within the last half century, land-draining, town-sewering and other sanitary regulations, have contributed to prolong human life from five to fifty per cent. as compared with previous rates in the same district. Some of the terrible epidemic diseases have been blotted out of existence; all much ameliorated; even agues and typhoid fevers are reduced in the frequency of their occurrence. Since 1840, an annual mortality in English towns of forty-four in one thousand has been reduced to twenty-seven; an annual mortality of thirty has been reduced to twenty, and even as low as fifteen.

The same remarkable reductions have taken place in the mortality and loss strength in the army and navy.

Although sanitary science is yet in a very imperfect state; although its beneficent objects have as yet been very imperfectly accomplished, yet the great benefit it has been to the human race is incalculable. Let us pass in review a few facts:—

In the city of Geneva, in the sixteenth century, one individual in twenty-five died annually; in the eighteenth century, one in thirty-four, and now about one in forty-six. In France, in 1772, the annual mortality was one in twenty-five; in 1845, but one in forty-five. In the State of Massachusetts, according to the registration reports for the year 1864, but one individual in fifty-one died annually.* The mean duration of human life in France, sixty years ago, was twenty-eight and a half years; now it is about thirty-three and six-tenths years. In Massachusetts, as indicated by the report above alluded to, it is thirty-eight and a half years. In the United States in 1849–50, there was one death in 79.6, or 1.26 per cent. of the entire population; in 1859–60, one in 79.77, or 1.25 per cent.

We have a striking illustration of the connection between municipal hygiene and epidemic diseases, in the comparative exemption of the cities of the Atlantic seaboard from epidemic cholera during the summer of 1867, while some of the cities of the West suffered to a fearful extent. In the former quarantine and sanitary regulations were vigorously enforced; in the latter they received very little attention.

The plague, the greatest scourge of all Europe a few centuries ago, is now nearly extinct, and especially has all western Europe, once a great sufferer, seen nothing of it for over a century. Small-pox, once hovering over the world with the dark wings of destruction and desolation, carrying terror into the hearts of all Christendom, is now rare in its visitations, and disarmed of much of its former terror; also, previous to the nineteenth century, the dreaded scourge of the Southern coast cities, yellow fever, ravaged the Northern cities, and was little known in our Southern coast towns; but it is now a frequent visitor among us and but little known in Northern cities—all of which has been effected by the development and public appreciation of sanitary science.

Through the efforts of the medical profession, sanitary science has already secured a high position in the public esteem, and statesmen, philanthropists and political economists are giving it much attention.

Many of eminent judgment are of the opinion that as many former epidemic scourges have been greatly ameliorated and shorn of their terror, we should look forward to a great improvement, and perhaps exemption from our present epidemic destructions.

With these facts before us, may we not hope, by a still more thorough and efficient system of municipal hygiene, to banish Asiatic cholera and yellow fever entirely from our shores, and greatly diminish the mortality from all diseases incident to summer and autumn in our cities?

As corroborative of the above facts, and illustrative of what we may hope for in the future regarding an exemption from our destructive epidemics, I will introduce a historic fact connected with the Egyptian plague, which at one time desolated the old world more terribly than any of our former epidemics.

According to the opinion of most physicians, we have to accept Egypt as the country whence the plague most frequently extended itself; it becomes evident, after earnest inquiry, that during the past epidemics, Cairo and the villages of the Delta near that city were generally attacked first and suffered most.

Cairo had several hundred thousand inhabitants. Before the watering and sweeping the streets was introduced by the Viceroy, Mehemet Ali, they were full of filth. A canal running through the city received all kinds of refuse, and was much neglected; its borders had always been considered as most unhealthy, and most frequented by the plague. Moreover, Cairo was surrounded with an almost complete circle of hills, one hundred and fifty to three hundred feet in height, and where these ceased, by a projection of the Mokattam mountains. Thus purifying winds were cut off from the city. The disease always appeared after the receding waters of the Nile had left much animal and vegetable matter decaying, and producing miasmata under the combined influence of heat and moisture, and after raging several months, disappeared with the nucta (a heavy dew) and the scorching rays of the June sun.

Nowhere, throughout Egypt, was the generating of such miasmata more favored than in or around Cairo; the refuse of several hundred thousand inhabitants, the neglected canal, and a marsh near the city, exhaled their poisonous gases, which at once ripening in this basin surrounded by hills, seized upon thousands of people, whose neglected corpses increased the corruption of the air. In this way, first Cairo and the villages around it were desolated, then other parts of Egypt, the Turkish Empire, and before the introduction of protective quarantine and *cordons sanitaires*, almost the whole of the world; the disease traveling in all directions, communicating itself to healthy places. Thus the plague of Marseilles infected other parts of the province and southern France, but it came, nevertheless, originally, from Egypt to Marseilles.

Mehemet Ali gave orders to clean the city, and to water and sweep the streets every morning, but the state of health did not materially improve. It had already been remarked by physicians of the army, at the time of the French-Egyptian expedition, that the encircled position of the city, combined with other unfavorable circumstances, must be very unhealthy. Advisers of Mehemet Ali repeated the remark, and the Viceroy, who was a tyrant, but seldom shrinking from the extent of an enterprise, took the bold resolution of carrying down a large portion of the earthy hills into the fields, which, after having sufficiently elevated, he intended to water artificially and to convert into beautiful gardens. As once the Pharaohs dragged thousands of men to the erection of temples and pyramids, so Mehemet Ali forced thousands of fellahs (Egyptian peasants) to execute his plans.

"Many died under the excessive labor, but the ranks were filled by others, and the work itself was always advancing. Thus a long chain of hills was carried

down, and miasmatic fields converted into charming olive and fruit gardens. And as the work progressed the health of Cairo improved."

The disease, no longer brought from Egypt to other parts of the Turkish Empire, disappeared. Mehemet Ali has proved what can be done, even under the most unfavorable circumstances, by his grand and energetic measures in improving the health of one city; and by thus destroying the germ of this most destructive of all diseases, he has unconsciously saved the lives of millions.

The above fact shows what can be accomplished by blind energy and indomitable will.

DISINFECTANTS AS A MEANS OF PREVENTING THE SPREAD OF YELLOW FEVER.

We have shown that reliance cannot be placed in quarantine, for the simple reason that it is impossible to make it complete with our facilities for the transportation of persons and goods by railroads and steamboats, and the long time the disease may lie dormant or in a state of incubation—being at least twenty to twenty-five days; and another great trouble is the almost impossibility to diagnose a mild case from a case of dengue, or a case of remittent fever, in one who has not lived in a malarial district. Physicians who are not familiar with all forms of yellow fever, as well as all types of malarial fever, *cannot do it*, for it will be seen that those who ought to know better will contend that cases are not yellow fever when there are four or five cases with black vomit. Some even go so far as to assert that we did not have any cases of yellow fever in Texas in 1873, when we undoubtedly had terrible epidemics at Calvert, Marshall, and Columbus, besides sporadic cases at many other places. When it originated in Galveston, in 1864, I know it was disputed until there were at least seven deaths from black vomit, and four of our yellow fever doctors signed a statement that there were no cases in the city; but three days afterward they came out in a card stating it was epidemic. I was threatened with a court-martial for declaring it was yellow fever. The positive assertions that it did not exist, kept many persons in the city who would have left, and prevented the post commander, General Hawes, from removing the troops out of the city (which was finally done), and kept even the General in the city until he took it. The same counsels prevailed in 1867, until the United States troops had it in their camp, and General Griffin himself had it and died, as well as General Taylor, his medical director. Both could have been saved by their removal out of the city. The troops were isolated and quarantined at last, with a great reduction of new cases.

These are some of the reasons and circumstances that prevent a complete quaran-

tine, as well as the adoption at an early day of disinfectants and isolation, both of which have been efficient in checking the disease, as we will further show, and which should be rigidly enforced, as they do not interfere with commerce and do not embarrass those who have had the disease, and consequently think more of making money than of securing protection to their neighbors and fellow townsmen.

That yellow fever can be prevented by sanitary measures, assisted with disinfectants, has been almost demonstrated, in 1873, at Galveston, Houston, New Orleans, and Mobile, where they were extensively adopted, as will be seen in the following reports. They have the advantage at New Orleans of complete and almost perfect sewerage, washing out the city with water obtained from the Mississippi. It is also a well-known fact, that at New Orleans they never have had an epidemic of yellow fever in the years the Mississippi overflowed the city, since its settlement; and it will be seen from the table that it has occurred there sixty-six times since its first introduction. In Galveston, we were assisted by the very dry weather in 1870, and by the heavy rains in 1873, but we did not rely on either. The city was made as clean as possible, the privies were ordered to be cleaned once every two weeks, at night, and sulphate of iron (copperas), carbolic acid, or chloride of soda or lime put into the boxes. The low, wet places were sprinkled with lime, and all animal filth was removed out of the city, in carts. When there was a case reported, it was watched by the health officer, and the place isolated and completely disinfected and fumigated with sulphuric acid and permanganate of potash, kept in open saucers in the room; all clothing and bedding were burned, and where possible, the house was vacated for a time. This was more rigidly enforced in 1873, and an ordinance passed to compel any and every physician practicing in the city to report cases of yellow fever, small-pox, or cholera to the health officer, under a penalty of a fine of one hundred dollars in each and every case. Reports of cases were made by several physicians, who were much abused by other physicians for spreading alarm; the newspapers doubted the truth; and even the health officer said to the writer, when he had made a post-morten on an undoubted case, "*Where did it come from?*" intimating that if it were yellow fever, he must have caught it somewhere. It was well known that persons were arriving every week from Shreveport, Marshall and Calvert, at that time, and steamers were plying between Galveston and Havana every week, with cattle; but though they were not allowed to land at Galveston, they went up the bay and landed, and took on cattle and put off goods and persons to a limited extent, where this man had been, and he had also been sick in the hospital some ten or fifteen days before. I knew not his history then, but replied, in very emphatic language, "it was yellow fever, if he came from the clouds."

The disposition to ignore yellow fever, by almost every class, is surprising to me. Men who fear it, and intend to run, as we call it, will dispute with the wisest and best physicians about it, and will not believe the truth. A gentleman and his wife —intimate and particular friends—told me I must let them know of the first case of yellow fever that occurred, and they should rely on me as a friend to tell them. In 1867, I had made a post-mortem on an undoubted case in the city hospital, and as soon as possible I called and told them. They looked astonished and uneasy, but were not disposed to believe it. Mr. B. went down town and saw several persons, and among others a doctor or two; they told him it was all humbug; Dowell was an alarmist. He came back contented and satisfied to remain, and did remain. Dr. C., at the post-mortem, said, when I had found black vomit in the stomach and held it up in my hand, "*Now, Dowell, if yellow fever should break out here, don't you*

say that this is a case of yellow fever, and that is black vomit." He was supposed to be one of our best yellow fever doctors, and to have seen it in hospital and private practice, and ought to know. I replied, "*it is yellow fever; this is black vomit. I do not care who says to the contrary.*" I have never seen anything but black vomit like this, and I have never seen anything like it in any other fever or condition. I kept some of this black vomit for several years; and it was not more than two weeks afterward that Dr. C. admitted it was yellow fever, and that it was black vomit. Mr. B. had the disease, but sent off his wife. He, fortunately, recovered.

It will be seen in the sequel that these controversies are common, and occur everywhere, and in the beginning of nearly all epidemics, until now it has become almost an axiom with me to say, when parties quarrel over a case of fever, one calling it yellow, another congestive, another jaundice, and still another paludal or hemorrhagic malarial—that it is really yellow fever. We admit that matter is thrown up in cancer of the stomach, puerperal fever, some cases of jaundice and remittent fever, but no one who knows these diseases and their symptoms can possibly make a mistake, unless he shuts his eyes to all facts. Cancer is a chronic disease, and will last for months; yellow fever proves fatal in ten or fifteen days at furthest. It is always an acute disease, premonitory symptoms only lasting a few hours, while all the others have a variable course; other circumstances also clearly show its type.

With these statements we are prepared to appreciate the following reports, made to Dr. Woodworth, Supervising Surgeon of the United States Marine Hospital, on the yellow fever at New York, New Orleans, Mobile, Memphis, Cincinnati, Cairo, and Louisville, in 1875, which will fully illustrate what I have said of quarantine and disinfectants, and their effects as preventive measures.

THE YELLOW FEVER OF 1873.

REPORTS FROM MEDICAL OFFICERS, U. S. MARINE HOSPITAL SERVICE,
WITH A NOTE BY THE SUPERVISING SURGEON,
JOHN M. WOODWORTH, M. D.

[Meantime, it may be remarked that the substantial immunity of New Orleans and Mobile from yellow fever this year, under similar conditions of repeated exposures on the one hand, and of well-organized municipal sanitation, coupled with free carbolic disinfection, on the other, would seem to indicate that one or both of these latter are sufficient to arrest yellow fever, or at least to prevent its becoming epidemic. To what extent the use of carbolic acid is an efficient agent is yet to be determined; but of the value of general disinfection, thorough cleanliness, good sewerage, pure air, unpolluted water, wholesome food, individual hygiene—in short, of what goes to make up a good sanitary condition, there can be no question. When such a condition obtains generally throughout the land it will probably only remain to prevent the introduction of fomites, by an intelligent quarantine, in order to be justified in writing *dele* opposite *febris flava* in the American nosology.—W.]

NEW YORK, December 1, 1873.

SIR:—In answer to your communication of the 15th ultimo, concerning yellow fever, I have the honor to submit the following report of cases treated in the United States Marine Hospital (Class II), port of New York, year 1873:—

1. Jorgen Andersen; æt. 23; nationality, Swedish; occupation, seaman; admitted from schooner *Jennie Stout;* taken sick on passage from New Orleans; entered hospital July 30; died August 1.

The two following cases from same vessel, admitted at same time, recovered:—

2. Gulick Gulbrozen; æt. 23; discharged August 21.

3. Bernard Nicholson; æt. 37; discharged November 3.

4. George Otto; æt. 19; nationality, German; occupation, waiter; admitted from steamer *Moro Castle;* taken sick on passage from Havana; entered hospital August 30; died September 1.

5. Madison Wismore; æt. 27; nationality, American; occupation, engineer; admitted from steamer *Metropolis;* was sick in New Orleans, though the disease was not positively ascertained to have been yellow fever; entered hospital September 22; died September 27. This was undoubted yellow fever when received, and was probably a relapse.

I have also obtained from the records of the Board of Health of this city the particulars of the only cases there reported, as follows :—

Fred. W. Bacon ; æt. 22 ; waiter on steamer *Yazoo ;* sailed from New Orleans for Philadelphia latter part of May ; touched at Havana ; and was quarantined, on account of cholera, in New Orleans. Sickness appeared on the ship May 27 ; arrived at Philadelphia May 29 ; was not quarantined. Bacon came on to New York ; arrived May 31 ; sick on arrival ; taken to No. 7 Eldridge street, and died June 2.

Patrick Hennessy ; æt. 30 ; came from Memphis last of October ; also sick on arrival ; died in ambulance on way to hospital, October 30.

The cases reported in Brooklyn were newspaper cases, and were pronounced to be malarial fever by competent authority.

I have the honor, also, to transmit the inclosed communication from Dr. Mosher, deputy health officer of the port of New York :—

HEALTH OFFICER'S DEPARTMENT,
QUARANTINE, TOMPKINSVILLE, S. I., November 3, 1873.

MY DEAR DOCTOR :—I am requested by Dr. Vanderpoel to furnish, in answer to your inquiry of 30th ultimo, the following :—

Cases of yellow fever occurring at quarantine during 1873 :—

1. First case, May 23. 2. Last case, October 1. 3. Total number of cases, 62. 4. Mortality, 13 deaths. 5. All cases were taken from vessels arriving at this port.

Very truly yours,

Dr. HEBER SMITH. J. S. MOSHER.

From the foregoing it will be seen that there were in all sixty-nine cases of yellow fever, and eighteen deaths therefrom, at this port during the past season ; and that so long as quarantine is a matter controlled by State caprice or fear, there is nothing to prevent the introduction of this or any other disease into a community, no matter how rigid or perfect the quarantine of such community may be made—and its present administration at New York is both.

That the yellow fever failed to become epidemic in New York the past season—that it is not epidemic in New York every season—is due, probably, first, to the want of favoring conditions in the season itself, and, second, to the efficiency of the Board of Health ; but certainly not to the want of a supply of fomites furnished by land from other ports.

I am, sir, very respectfully, your obedient servant,

HEBER SMITH,
Surgeon U. S. M. H. S.

JOHN M. WOODWORTH, M. D.,
Supervising Surgeon U. S. M. H. S.

NEW ORLEANS, LA., November 5, 1873.

SIR :—Referring to your letter of October 24, asking for "a sketch of the present yellow-fever epidemic, on its subsidence, the local influences that have affected the disease," etc., I have the honor to state that the first ascertained cases of yellow fever reported in the city were from the Spanish bark *Valparaiso*, which arrived

here from Havana in ballast, with five passengers, June 26th, 1873, having been detained at quarantine four or five days. The mate of this vessel is the only one on board who did not recover, but several vessels lying in the immediate vicinity lost a number of their crew. The number of cases and deaths from the disease, to the 29th ult., is as follows :—

Weekly Statement of Yellow Fever Cases and Deaths in New Orleans during the Season of 1873.

During the week ending—	Cases.	Deaths.	During the week ending—	Cases.	Deaths.
Six o'clock P. M.			*Six o'clock* P. M.		
July 6, 1873.	1		September 14, 1873.	60	35
" 13, 1873.	2	1	" 21, 1873.	37	26
" 20, 1873.	. .	1	" 28, 1873.	32	21
" 27, 1873.	1	1	October 5, 1873.	42	14
August 3, 1873.	5	. .	" 12, 1873.	32	24
" 10, 1873.	6	3	" 19, 1873.	34	18
" 17, 1873.	10	2	" 26, 1873.	19	11
" 24, 1873.	8	8			
" 31, 1873.	16	6	Total.	343	187
September 7, 1873.	38	16			

For the foregoing table I am indebted to the courtesy of Dr. S. C. Russell, secretary of New Orleans Board of Health.*

* * * * * * * * *

It is certain that our first cases came from Havana. Quarantine did not prevent it; and it is the opinion of the medical gentlemen who went from here at the first call of distress from Shreveport, that yellow fever was carried to the latter place from New Orleans. Drs. Bruns, Choppin, and Davidson, the physicians referred to, are intelligent, experienced, and well-known members of the faculty, and their opinions are entitled to respect.

New Orleans has been terribly exposed this season from all quarters; for though the disease was brought here originally from Havana, there has been constant communication between this port, Shreveport, and Memphis, and thus repeated new importations. Nurses went from here to Shreveport and returned during the height of the epidemic there, and died of the disease here; and fugitives from the pestilence in Shreveport came here to die. To what influence we owe our immunity from the disease, for it has not shown a disposition to spread, I am not prepared to express an opinion, particularly when old physicians of this city, who have devoted a life-time, one may say, to the study of yellow fever, seeing it in all its phases, have openly confessed their inability to interpret its true nature, and, to use their own words, "the more they saw of it the less they knew about it."

Are we indebted to quarantine regulations for the small number of victims of this scourge? This is hardly probable, for it is proved that the disease was imported from Havana as early as July 6, and it did not appear in Shreveport until the middle of August. Vessels have been arriving weekly from Havana, where the mortality was from four to five hundred daily [weekly?] in July and August, sparing neither native nor foreigner;† and in Memphis, Shreveport, and elsewhere the disease has been fatal almost without parallel. And yet I may safely assert

*[The total number of cases, as subsequently reported by Dr. Smith in "Disease and Injury Return" for November, 1873, is given at 394, with a total of 225 deaths; the first case (the mate of the *Valparaiso*) appeared on July 4, died July 8; the last case reported, taken sick November 18 died November 24.—W.]

† This statement I have from one who was in Havana during this time.

that New Orleans, during the last season, has been one of the few cities of the Union that can boast of a small death-rate in proportion to its population. To what, then, are we to attribute this miraculous escape? In my opinion, thanks are due to good sanitary regulations, to the watchfulness and activity of the board of health, and to the free use of carbolic acid,* that yellow fever in this city has been greatly modified, if not completely disarmed of its subtile and terrible power.

I am, sir, very respectfully, your obedient servant,

ORSAMUS SMITH,
Surgeon U. S. M. H. S.

JOHN M. WOODWORTH, M. D.,
Supervising Surgeon, U. S. M. H. S.

MEMPHIS, TENN., November 18, 1873.

DEAR SIR:—Your communication of the 24th ultimo, requesting me to furnish such facts in regard to the late epidemic of yellow fever in Memphis as are at my command, was duly received, and has already been acknowledged. The delay in furnishing the desired information is due partially to the stress of other duties and engagements growing out of the epidemic, and partially to the necessity of sifting facts from rumors and speculations, which are always rife at such a time.

From the best information I can get on the subject, the first case of yellow fever died in Memphis on the 10th of August. This was a man named Davis, who had been in Texas, and on his way home to Alabama passed through Shreveport, La., during the late epidemic there.

At the mouth of Red River he got on the tow-boat *Bee*, which left New Orleans August 2d. The man was put off the boat here, at the upper landing, near the mouth of Wolf River, in the afternoon of the 10th of August. At the time he was very ill, unable to take care of himself, and was cared for a few hours by a man named Riley and another man (name not known) who lived near the landing. That evening he was carried to the Adams street station-house, where he died during the night. No physician saw him, but, from what I can learn, there was no doubt of his being a case of yellow fever. Riley, the man with him, and several members of his (Riley's) family, contracted the disease and died a few days after. The physician who visited them I have been unable to find, but the presumption is they were attended by Dr. Crone, who died of yellow fever in September. When the tow-boat arrived here, the captain, C. B. Gall, and several of the crew, were sick. The boat remained here but a few hours, and then proceeded on its trip up the river. At Osceola, Ark., the captain died, and his body was shipped back to

* [It is asserted that nowhere in the world before has disinfection on so extensive a scale been resorted to as in New Orleans during the yellow fever season of 1873; and, as also in Mobile, it met with considerable opposition from some quarters. Concerning the value of this disinfection, which was begun in New Orleans during the first week in August by the free use of impure carbolic acid, Dr. A. W. Perry, Sanitary Inspector New Orleans Board of Health, in a communication to the *New Orleans Medical and Surgical Journal* for November, says: "To ascertain whether or not the small number of subsequent cases (in infected districts) was because of the small number of persons liable to yellow fever who lived in these squares, a census was taken of the total population of each of the squares, and also of the white persons who had come to the city since 1867, the last epidemic year. In thirty squares, in which most of the yellow fever cases occurred, the total population was 5223, an average of 174 per square; of these 1249 were liable to take yellow fever, being nearly 24 per cent. liable. Of the liable persons 7.3 per cent. took the disease before disinfection, and .9 of one per cent after disinfection." As an isolated fact this is certainly very striking; but isolated facts are not conclusive, and this question is still open for investigation.—W.]

Memphis for burial. The body was not coffined until after its arrival here, on the 11th of August, and presented all the appearances of having died of yellow fever.

There were a number of deaths during the last two weeks of August in the neighborhood of the place where the *Bee* landed, but they were not reported as yellow fever by the physicians who attended them. The first case that there is any official record of, is the case that I reported in the City Hospital. A patient was admitted to this hospital September 2d, very ill with yellow fever; had evidently been sick several days, and died on the 3d. The register then shows admissions of yellow fever patients on September 3d, 5th, 8th, etc. I am satisfied there were a number of cases in the city before any were admitted to hospital, but the disease, if recognized by any physician, was not reported as such.

On September 3d I was called to visit a child at the St. Peter's Orphan Asylum, a Catholic institution, located a short distance from the City Hospital. This child was admitted into the Asylum August 28th, apparently well; was taken sick on the 2d of September, and died on the 7th. For twenty-four hours previous to death it had unmistakable black vomit. This child was brought to the Asylum from the foot of Market street, which is in the immediate neighborhood of the point where the boat *Bee* landed, and there had been several deaths in the house whence the child was brought.

The disease prevailed mostly in the northwestern portion of the city, between Washington and Concord streets. But it extended north, beyond the bayou, to a part of the city known as Chelsea (the Ninth ward), mostly occupied by residences, and prevailed here, to a very considerable extent, more than it did in any other suburb. It also extended south and east as far as the city limits, and I knew of several cases beyond the city limits east. It was never as bad in south or central Memphis as in that portion of the city north of where the first case was reported. My opinion is the infection was conveyed by the wind, which in summer and fall, with us, blows from the south to the portion of the city north of the infected district.

The number of deaths from yellow fever will never be definitely known, as proper official record for the city was not kept, and a number of deaths from the disease were reported as from other causes. And, moreover, for at least three weeks after the disease appeared physicians did not recognize it, or at least did not report yellow fever.

The number of deaths from September 14th, the date it was first officially published, to November 9th, is as follows, taken from the printed reports of the secretary of the Board of Health :—

From September 14th to 30th, inclusive	259
From October 1st to 31st, inclusive	899
From November 1st to 9th, inclusive	86
Total	1244

The largest number of deaths on any one day occurred October 10th, when 55 died.

There have been deaths from the disease reported since the 9th of November; and there will, no doubt, be others even after this, November 18th.

The report from the City Hospital from September 2d to October 31st, inclusive, is as follows:—

Number of cases admitted from September 2d to October 31st, inclusive..... 169
Deaths from yellow fever..... 103

Number of cases in hospital October 31st, 18. Of these, 13 are convalescent and 5 are under treatment.

(The above is taken from report made to the secretary of the Board of Health November 1st.)

The deaths in the City Hospital, and also in the Walthall Infirmary, a temporary hospital established during the epidemic, are included in the report of deaths published by the secretary of the Board of Health for the whole city. This is as near as I can give the deaths at this time.

I am unable to give the number of cases that occurred in the city, nor will it ever be known. The misfortune was that there was no well-organized, paid board of health at that time; our city was defective in its sanitary regulations, and there are no official records of a vital or sanitary character outside of the City Hospital prior to September 2d. There is no doubt in my mind that yellow fever was brought here from the South early in August. But I am unable to ascertain when the first case occurred among the residents of the city. I think there is no doubt of its occurring after the 10th of August. Nor do I think there is any doubt of there having been deaths here among the residents of that portion of the city subsequently known as the "infected district" prior to September 1st.

* * * * * * * * * *

There were only four deaths of marine patients from yellow fever in the hospital during the epidemic, three white men and one negro. They have been reported in my official reports to your office, and were included in the general mortality report of the city.

* * * * * * * * * *

I am, sir, most respectfully, your obedient servant,

G. B. Thornton, M. D.

John M. Woodworth, M. D.,
Supervising Surgeon, U. S. M. H. S.

Mobile, Ala., December 6th, 1873.

Sir:—In compliance with your letter, dated October 24th, relative to yellow fever in Mobile this season, I have the honor to submit the following:—

The published report of the health officer to the Advisory Board of Health—an extemporized organization, created to assist the city physician during the prevalence of the epidemic—is so full and complete for the period prior to November 1st, that it will not be necessary to do more than summarize my own observations and experience of the epidemic, and to complete the table of cases by adding those which occurred subsequent to October 25th.

The following table gives the dates of occurrence, and number of cases on each day, with the result of the cases:—

Date of Occurrence.	No. of Cases.	Result.		Date of Occurrence.	No. of Cases.	Result.	
		Died.	Recovered.			Died.	Recovered.
August 21	1	1	..	October 13	2	..	2
September 11	2	1	1	14	1	1	..
15	2	1	1	15	1	..	1
17	2	2	..	16	1	1	..
18	1	..	1	21	5	2	3
20	1	1	..	23	1	1	..
22	3	1	2	25	1	1	..
23	1	..	1	November 2	1	1	..
25	1	1	..	3	1	1	..
26	5	1	4	8	2	1	1
30	1	1	..	17	1	1	..
October 1	2	1	1	23	1	1	..
4	1	..	1	27	1	..	1
5	3	2	1	29	1	1	..
6	1	1	..				
8	2	..	2	Total	50	27	23
9	1	1	..				

The first case of yellow fever that appeared in Mobile was that of Owen McKenna. The facts in this case, as reported by Dr. Hicklin, the health officer, are as follows: "A resident of Mobile the past three years, unacclimated; went to New Orleans on the 16th of August, and returned the following day, 17th. He was taken sick on the 21st, and died on the 26th day of the same month. His attending physician pronounced it yellow fever. He resided on Hamilton street, southeastern portion of the city, and was the only case known to me—save Dr. F. M. Stone, who sickened and died of the disease in the month of October—that occurred in that section of the city during the entire prevalence of the disease." Dr. H. states that McKenna's death was before the date of his appointment to office, and he was not apprised whether any disinfection of the premises was made. It may here be stated that the chief duty of the health officer to the Advisory Board was to superintend the disinfecting of all sections and premises where the disease appeared, the physicians being requested to report every case which occurred under their charge at the earliest moment possible.

The next case came directly from Shreveport, via New Orleans. He resided above Shreveport, and in passing that city remained all night. On the morning of September 11th he was found on the wharf, under an old shed, by a policeman, who conveyed him to the hospital, by order of the city physician, who had seen and examined the case, and pronounced it to be yellow fever; died on the 13th. On the way to the hospital he was supported in the conveyance by the said policeman, who, together with his son, were both taken sick, the 15th and 18th, respectively, on Spring Hill road, in the northwestern portion of the city, immediately in the district which afterward became the "infected quarter," and from which the disease spread in that portion of the city.

In the hospital where this second case was carried and died there have been eight cases treated, including his, all of which originated therein, none being admitted from outside save that. Of this number five died and three recovered.

The disease was introduced into the marine hospital in the following manner: On

the 11th of September, Robert Smith, an Englishman, long a resident of Mobile, was admitted with what was recorded as intermittent fever, a diagnosis based upon the periodicity in the occurrence of two successive chills followed by fever. The first chill took place on the 10th of September, the day prior to his admission. These chills recurred on the 12th, 13th, and 14th, after which his fever became continuous and the complication of another disease, yellow fever, was recognized. This patient had been under treatment a few months before, for malarial fever. Investigation of his case furnished the following facts: He was employed as a watchman on the steamer *Emma No.* 2, that had been lying for a considerable time at the end of the wharf from which Dixon, the Shreveport case, was taken. From idle curiosity Smith visited Dixon under the shed, a short distance from the steamer, and assisted in placing him in the conveyance for the city hospital. This was on the morning of the evening Smith took sick, and doubtless was the source and time of his infection. This was a typical case of the existence of two distinct morbid poisons operating at the same time in the system. After a severe illness of seventeen days, and the occurrence of black vomit on the third day of the fever, reckoning from the date of its recognition, this patient made a fair recovery.

At this time thorough disinfection was instituted and maintained in and around the hospital buildings for a period of six weeks, under the supervision of the health officer, acting under the directions of the Board of Health, and to whose opinion as to its efficacy in its employment generally throughout infected localities I shall have occasion to refer further on.

Case 29.—On the 8th of October, O. L. Crampton* was taken ill of yellow fever at this hospital, where he was quartered, and after an illness of nine days recovered. The infection, doubtless, was in this instance from the Englishman, Smith, as the prevailing winds were, up to this time, from the north and east, carrying the germs of the disease from the already infected buildings, the city hospital and infirmary, to the south and west. It is not known that exposure from any other source could have happened, as every precaution had been observed in protecting against it by confinement to the building after certain hours in the evening and before certain hours in the morning, thereby escaping the moist, and consequently dangerous, night air that existed almost constantly through the months of October and November. It may be well to state, in explanation of the situation of the hospital buildings mentioned, that the marine hospital is situated on Saint Anthony street, north side, between Bayou street on the east and Jefferson street on the west, occupying, with its grounds, an entire block. The city hospital covers the greater portion of the adjoining block to the west, facing on Saint Anthony street; and the infirmary, the block directly opposite the city hospital, facing likewise on Saint Anthony street. These squares, together with the one opposite the marine hospital, comprise about eight square acres, and cover what was designated the first and essential "infected section," upon which the Board of Health directed all its energies in a rigid quarantine and thorough disinfection.

Case 35.—Mr. C. C. Colton, employed in the custom-house of this city as hospital and enrolling clerk, was attacked with yellow fever October 16th, and died in this hospital October 20th, a victim of the most malignant type of the disease. Mr. Colton was from the northern part of this State, where he had engaged in "planting" for the past six years; had been a resident of this city five months, and consequently unacclimated; knowing the danger he would incur in remaining in the city con-

* The surgeon in charge.—W.

stantly, he had determined upon the risk, and to remain until such a time as it should be pronounced an epidemic. By invitation he made this hospital his residence, as a guest of the surgeon in charge; and though the true character of the disease was made known to him by the attending physician to Case 29, he chose to remain and nurse said case, from which he took the disease, with the result as above mentioned.

From Case 29, three seamen, 31, 32, and 34; a colored servant, gardener to the hospital (Case 37), and the steward of the hospital (Case 36), took yellow fever and recovered. Two of the seamen had just arrived from New York city; discharged from their ship sick; applied to the hospital for treatment, and accidentally entered the room in which Case 29 was sick. The third seamen had been an inmate of the hospital for some time with a chronic disease, and was exposed in like manner; and the steward and servant assisted in Case 29.

It is a noticeable fact that only those persons directly exposed to Case 29 were attacked, and that others throughout the building escaped, having no access to the rooms of those sick of the fever. Every precaution was taken to isolate all those immediately exposed, and to prevent a spread by saturating the atmosphere of the wards, and throughout the building, with carbolic acid and chloride of lime.

The cases occurring in November were mostly those who, as refugees, had remained absent from the city during the existence of quarantine, and returned too early, though advised so to do by their physicians, basing their opinions on the action of the Board of Health in recommending the raising of quarantine, and the return of citizens to the city. Doubtless the greater rate of mortality among this class over those that remained in the city was due to facts well known to the profession. Two of these returned refugees died in houses that had remained unoccupied and unopened during the season.

The means employed to arrest the course of the yellow fever were the energetic, thorough, and liberal use of carbolic acid throughout the vicinity of the infected district and premises having fever cases. The winds, with an average mean temperature of 78.5°, continuing to prevail from the north and east during most of the season, carried the disease to the south and west, leaving the "primary infected section," a small corner in the northeastern portion of the greater area, that finally became known as the "*infected district.*" The efforts to prevent the yellow fever from extending beyond this district met with deserved success; and the course pursued by the Board of Health of New Orleans in the epidemic of yellow fever of 1871, in "stamping out" the disease, was strictly pursued here. The health officer of Mobile states in his report that, during a period commencing September 18th and ending October 20th, he "had used over a thousand gallons of crude carbolic acid and nearly three thousand pounds of sulphate of iron. Chlorine gas, used for the purpose of fumigation in the houses, we generated by the action of sulphuric acid upon the black oxide of manganese and chloride of sodium." In concluding his report, Dr. Hicklin remarks, "that the result of their labors," speaking of the Board of Health of Mobile, "is too apparent to the world, when the mortuary record of the past two months is consulted, to permit a doubt to remain in the mind of any honest individual as to the good they have done." And further, "New Orleans and Mobile were at the beginning of the season in close, almost daily, communication with Shreveport, Memphis, Pensacola, and Montgomery. The first two, New Orleans and Mobile, began an early and systematic use of disinfectants and fumigations. They escaped, or hedged in the disease, and no *epidemic* resulted, notwithstanding cases

were brought into the midst of each of them from the hot-bed of the disease, Shreveport."

In summing up the facts in the history of the disease in Mobile this year, it would appear that the theories advanced as to the nature, cause, and prophylaxis of yellow fever, by Dr. C. B. White, of New Orleans, in his annual report for 1871, based, I presume, chiefly upon his experience in that epidemic, have received another valuable support in like results effected in Mobile this season.

I am, sir, very respectfully, your obedient servant,

O. L. CRAMPTON,

Surgeon-in-charge U. S. Marine Hospital, Mobile.

JOHN M. WOODWORTH, M. D.

Supervising Surgeon U. S. M. H. S.

CAIRO, ILL., November 8, 1873.

SIR:—In response to your request of the 25th of October for the facts concerning the cases of yellow fever at this place, I have the honor to state that, during the summer, and even after the disease was raging as an epidemic at Shreveport, the Illinois Central Railroad Company continued to receive cotton direct from that place and from Memphis. This cotton and other freight was received on board the transfer wharf-boat, conveyed up the bank to the depot and shipped east. Considerable freight from below, including cotton, was also received at Captain Phillips' wharf-boat. At the same time the work of filling in and constructing a new wharf was being carried on in the immediate vicinity of the transfer wharf-boat, which gave employment to thirty or forty teams hauling in the earth from near the Mississippi river.

On the 1st of September I received two cases of yellow fever at the hospital from the steamer *Mary Alice;* on the 10th, two cases from the tow-boat *B;* and on the 24th, one case from the *Keystone.* Four of these cases were fatal, being in the stage of collapse when brought in. The fatal cases all had black vomit, with more or less general hemorrhage from the mucous membranes, and the post-mortem appearances answered the description given in the books—orange-colored or golden-yellow liver; mucous membrane of stomach highly inflamed; shrunken and almost empty gall and urinary bladders, etc.

The first fatal case among the citizens did not occur until September 13th, when the cashier of the Illinois Central wharf-boat died. Then followed in rapid succession several other cases among persons employed in the same locality. Next, the clerk of Captain Phillips' wharf-boat sickened, and died on the fourth day. His nurse, a colored woman, who did the washing of his clothing, took the disease and died one week after; and a child in the house where the nurse died also took the disease, but recovered.

There were in all thirteen deaths out of about three times that number of cases of yellow fever among the citizens, making, with the four deaths among those landed here with the disease, seventeen deaths from yellow fever between September 1st and September 25th.

It was especially noted that the disease was confined to persons employed about

the river and the localities above described, the four or five exceptions which occurred being in the families of men who were thus employed.

The disease did not make its appearance among the citizens until after the first two cases were received at the hospital from the steamer; and no new fatal cases occurred among citizens after the establishment of quarantine.

Very truly,

H. WARDNER.

JOHN M. WOODWORTH, M. D.,
Supervising Surgeon U. S. M. H. S.

LOUISVILLE, KY., December 2d, 1873.

SIR:—I send you herewith, as requested, report of cases of yellow fever occurring in this city during September and October, 1873.

As there were no cases of this disease among the patients admitted to the Marine Hospital, this report is compiled from the reports of the attending physicians, who have been good enough to place the same at my disposal. I desire, in this connection, to acknowledge the receipt of such information from Drs. Fenner, Hewitt, Given, Leber and Blackburn, of this city.

1. The dates of the first and last cases of yellow fever in Louisville, during the year 1873, were September 22d and October 15th, respectively.
2. The total number of cases in the city, 10.
3. The mortality, 5.
4. The mode of introduction was by rail in all cases, except one by boat, and all were from Memphis, Tenn.
5. The local influences here were all favorable to recovery, being among the better class of people, and no spread of the disease was manifested.

I am sir, very respectfully,

P. H. BAILHACHE,
Surgeon U. S. M. H. S.

JOHN M. WOODWORTH, M. D.,
Supervising Surgeon U. S. M. H. S.

[Dr. D. P. Fenner, in charge of marine hospital patients at Shreveport, La., has undertaken the preparation of a detailed report of the epidemic at that place, which it was hoped to have received in time for publication with the foregoing; but sickness and other causes have delayed its completion. The following statement, in the absence of that report, is compiled partly from Dr. Fenner's letters and partly from medical journals and other sources deemed trustworthy.

The insanitary condition of Shreveport had attracted attention for some time previous to the outbreak of the epidemic, and was made a subject of much complaint by physicians and others. There was the usual absence of hygienic precaution and police; the accumulated filth of the city lay untouched for months; the streets

were neglected and uncleaned; the sewerage was so defective that the refuse of hotels and boarding-houses was poured out upon the surface of the ground, and the whole city was enveloped in a disgusting odor day and night.

Prof. Joseph Jones, M. D., of New Orleans, in commenting on this subject, says:—"Such is said to have been the sanitary condition of Shreveport, at the time of the breaking out of the epidemic; and if it is possible to generate in this latitude yellow fever by the combination of filth, heat and moisture, the conditions were certainly present for the origin of the pestilence *de novo*." The spring and early summer seem to have been as healthy as usual. The malarial fevers of the region did not attract special attention, either by their numbers or severity; but as the summer advanced, the continued heat of June and July, and the insanitary condition above noticed, aggravated their severity, and they began to assume a more and more malignant character.

During the latter part of July, what has been characterized as a "stampede" took place among the sailors and river boatmen at New Orleans, and numbers of them shipped on Red river packets, which were plying continually from that port to Shreveport, the navigation at that time being very good. On the 12th of August, according to Dr. Fenner, occurred the first case of yellow fever, of which he gives, substantially, the following details:—Newton Walker worked and slept on the levee in a store which was closed, the firm having gone into liquidation; took his meals at a place next door, in an eating and lodging house, a common resort of the lower class of boatmen and of that class alone; was attacked with the fever on the night of August 12th, and was first seen by the doctor on the 18th, at his (Walker's) brother's house, two and a half miles from the city. Two children, who had not been away from the house, subsequently sickened and died, at the end of three and four days respectively, with all the phenomena of yellow fever well marked; the whole family were rapidly attacked, and five or six died.

About the 15th of August several suspicious cases of illness among the boatmen were received at the hospital; but as none of them died, and there were no rumors of yellow fever at the time, they were diagnosed as cases of remittent fever. On the 19th of August it was reported that three men had fallen dead in front of the Mechanics' Exchange, on Texas street. Upon subsequent inquiry it proved that these men had been wandering about, sick; two of them lay down and died, and the other expired before he could be got to the hospital.

Yellow fever began to be now openly talked of. On the 22d a death occurred which was pronounced to be "without doubt" from the dreaded disease, and on the 25th two cases developed in a private family immediately across the street from the hospital referred to, and one case in Dr. Fenner's house, which adjoins the hospital. Cases also developed about the same time in Texas street, in and around boarding-houses used by steamboat men; and in all places frequented by river men the fever appeared early, and spread thence as from centres of infection. In about ten days after the disease was recognized and correctly diagnosed, say about the 1st of September, it had become epidemic, and was followed by a general exodus, so that, it was estimated, the population was reduced in a brief space at least fifty per cent. On the 15th of September the epidemic reached its climax, the deaths on that day numbering thirty-nine; but for many days after the number fluctuated between fifteen and twenty; whole families were swept away, and commercial firms, partners and clerks, were literally blotted out of existence. About the 17th of September the fever began to attack the suburban population and appear in the outskirts of the

city, at Marshall, Longview, Greenwood, Summer Grove, Bossier, Minden, and throughout Caddo Parish generally.

There was a decided diminution in the average of deaths per day after the 24th of September, and on the 30th the decrease in the number of cases in the city marked the abatement of the epidemic. During the month of October the fever slowly declined, and intermittent fever and dengue made their appearance.

The following statistics of the epidemic are mere approximations, which may be corrected upon the publication of subsequent reports:—Population, in July previous to epidemic, 9000; during epidemic, between 4000 and 4500; of these 1500 were negroes. Number of cases of yellow fever, 3000; number of deaths, 759; of these about 120 were negroes. Mortality about 25 per cent.—W.]

SUMMARY OF THE YELLOW FEVER EPIDEMIC OF 1873:

Showing the localities, number of cases and mortality, as reported by the Surgeons of the United States Marine Hospital Service.

Locality.	First case appeared—	Last case appeared—	Total cases.	Total deaths.	Mortality, per cent. of cases.	Cases in marine hospital.	Deaths in marine hospital.	Mortality, per cent. of cases.	Remarks.
New York, N. Y. .	May 23	Oct. 30	69	18	26.1	5	3	60.0	See report Dr. Heber Smith, ante, p. 101.
New Orleans, La. .	July 4	Nov. 18	394	225	57.1	24	13	54.2	Introduced by Spanish bark *Valparaiso*, from Havana.
Pensacola, Fla. . .	Aug. 3	Oct. 15	600	62	10.3	40	8	20.0	Supposed to be by deserting seamen from ship *Golden Dream*, from Havana.
Memphis, Tenn.* .	Aug. 10	Nov. 9	4204	1244	29.5	9	5	55.5	Brought by a traveler via Shreveport.
Shreveport, La. . .	Aug. 12	Nov. 10	3000	759	25.3	7	3	42.8	By river boatmen from New Orleans.
Mobile, Ala.	Aug. 21	Nov. 29	50	27	54.0	8	1	12.5	Brought from New Orleans.
Cairo, Ill.	Sept. 1	Sept. 25	43	17	39.5	5	4	80.0	By river boatmen; no cases after establishment of quarantine.
Louisville, Ky. . .	Sept. 22	Oct. 15	10	5	50.0	....	....	.....	All from Memphis, Tenn., nine by rail, one by boat.
Totals	.....	.....	8370	2357	.....	98	37	.....	The general hospital mortality of yellow fever is greater than that here shown for marine hospitals, which latter is unusually favorable, considering the class of cases, and the fact that the mortality list is swollen by patients landed and carried into hospital already moribund.
Average mortality, per cent. of cases.	.....	.....	....	....	28.16	....	....	37.75	

* Record for Memphis imperfect; the number of cases is not known, even approximately, while the number of deaths above given includes only those reported between September 14th and November 9th, notwithstanding it is known that deaths occurred both before and after these dates. The number of cases here given is based on the average proportion of cases to deaths at the other seven places, and is certainly not over, but probably largely under, the actual number. It is believed that the same strictures would apply with equal force to the statistics of Shreveport.

REPORT OF W. H. FARNER, OF YELLOW FEVER IN 1864, AT GALVESTON, TEXAS.

EDITOR GALVESTON NEWS:—I propose, in as brief a manner as possible, to give such facts as have come under my personal observation, with reference to the origin and spread of yellow fever in Galveston during the present season, with such other matters of interest as I may have been able to gather from the other professional gentlemen.

Previous to its introduction, our city had been unusually healthy, notwithstanding the great extent and fatality of other diseases throughout the State. For the last four years there has been but little disturbance of the soil from digging or improvement of streets, except the construction of breastworks, redoubts and fortifications. Most of these were constructed in the spring of 1863. The spring months had been unusually dry, with frequent sudden changes of temperature. During July and August we had heavy rains, followed by oppressive heat and sultry atmosphere.

The first case that occurred was a Mr. Graves, one of the crew of a schooner that had freighted at Tampico, ran the blockade, and landed at our wharves about the 15th day of August. She remained here several days before going into quarantine. During this time she was visited daily by a portion of our citizens; among the number was a Mr. Warren, who had gone on the boat and had been in direct communication with Graves. Ten days thereafter Mr. W. was attacked with a fever, which his attending physician diagnosed bilious fever. On the fourth day after the attack he died with black vomit—doubtless the first victim of yellow fever among our citizens. Captain McRea, who also visited the boat about the same time, was not taken down with the fever until the 3d day of September, and died on the 10th. The first night of his attack he slept with James Houston at the Ordnance office. Thirteen days thereafter Houston was attacked, and died in forty-eight hours. In about two weeks Captain Benton, who had been very assiduous in nursing Houston, was violently attacked, but recovered. The next day after Captain McRea's attack he was sent to the Post Hospital, but was discharged on the 9th, and went to the house of Mr. Mabus, where he died the next day, having black vomit about two hours before his death. Mr. Mabus was an old citizen, having lived here over twenty years. He contracted the disease and died on the 20th of September; subsequently several other cases occurred in this same house. A Miss Boden, who had been at Warren's, was attacked on the 2d day of September, and died on the 11th. During her sickness a child, aged three years, died in the same house, but whether it had been subjected to any other exposure cannot be ascertained. Miss Shrivenaugh had visited a lad by the name of Burns, who died on the 1st; she was taken sick on the 1st, but recovered. Other cases occurred in the same house, and one death.

In the immediate neighborhood of these localities sporadic cases occurred, which were generally diffused throughout the city. Among all those that came under my observation each and all were traceable to the fact of personal exposure to pre-existing cases, or exposure to infected localities; there may have been exception to this in the practice of others—but as Dr. Friedeman and myself had, at the commencement, claimed that the cases were genuine yellow fever, we were doubtless more particular in tracing out the exposure that those under our care had been subjected to, previous to their attack, than those who classed the disease "congestion of the brain." Owing to the indistinguishable character, and "dissimilarity" to former epidemics that had invaded this place, much diversity of opinion existed as to

its true character. Dr. Friedeman and myself having committed ourselves to the above opinion, watched its progress with peculiar interest, and on the 5th day of September had under treatment thirteen cases of clearly marked yellow fever. On the morning of the 5th Miss Shrivenaugh had black vomit; she, however, recovered, being the only instance of the kind that came within my knowledge, although it is stated that several others did recover.

If there had existed in our minds the least doubt of the correctness of our diagnosis, the result of this case must necessarily have dispelled it, and the gradual, persistent and fatal march from house to house fully satisfied us that the existing cases had ceased to be sporadic, and that a fatal pestilence was already in our midst.

Having come to this conclusion, Dr. Friedeman and myself immediately reported that fact to General Hawes. Other physicians, however, with equal, if not superior advantages, continued to deny the existence of yellow fever, or existence of "any symptoms partaking in the least of the character of it." Cards and editorials were published, in order to "disabuse the public mind" from such a foolish thought. Notwithstanding these denials, death continued its havoc among us, claiming daily new victims for the sepulchre, and strange as it may seem, during the first eleven days of September the report of M. Cahill, City Sexton, shows that out of seventeen interments thirteen are reported as congestion of the brain. On the 4th the epidemic character of the disease became so fearfully apparent that no further denial could be made, and hence we have no more deaths from "congestion of the brain."

In view of the many facts continually presenting themselves to the practitioner, it did seem strange to me that such apathy and indifference should be exhibited on a subject of such vast moment, and that such a diversity of opinion should exist among those familiar with the disease. I may be in error, but I claim that any attempt to suppress the truth or conceal the existence of a terrible epidemic, is highly censurable. It detracts from the profession by lowering its proud and noble dignity, and by a loss of confidence in the integrity, or a want of ability in the practitioner. It injures the reputation of a city, and brings odium and distrust upon its inhabitants.

Had the suggestions made by two physicians who visited General Hawes been fully and candidly carried out, doubtless many valuable lives might have been saved. This would have settled, at that early day, the character of the disease, and whether it had been propagated by a peculiar meteorological condition of the atmosphere, or infection, or contagion, or a combination of these, its acknowledgment at that time would have enabled hundreds who had come here from the country to remove beyond the sphere of its contaminating influence.

Such, then, was its origin and progress, and as it has entirely disappeared, I trust that we can now look back at its "peculiarities" without any reference to former contentions, simply for the purpose of arriving at the truth. Although it was evident to all that a fearful malady existed, physicians had expressed their antagonistic opinions, and adhered to them with a pertinacity that excluded unprejudiced conclusions at the outset. They can now inquire impartially into all the facts connected with the disease, and report with fidelity the results of their observations.

In justice to the Army surgeons, it is proper to state that most of them were not familiar with the disease, and hence took no part in the controversy.

At the time of the introduction of yellow fever we had a population of about four thousand, including the troops, most of whom were sent out of the city, leaving

a population of from two thousand to twenty-five hundred. Of these many were fully acclimated, and a large portion on former occasions had the disease. Although the disease had been remarkably slow in its march at the outset, it soon assumed such magnitude that physicians generally failed to keep any record of cases. The nearest approximation that can be arrived at of the number of cases treated is about twelve hundred; many of these, doubtless, were only sympathetic cases.

Of the deaths from yellow fever, including those reported as "congestion of the brain," we have the following results to November 20th :—

Whites over 10 years of age, males 162; females, 31—both 193. Whites under 10 years of age, males 32; females 31—both 63. Total whites, 256. Colored persons, males, 7; females, 2—both 9. Total number of deaths, 265. Of these, there were physicians, 3; soldiers, 121; citizens 138. Physicians generally concur in the opinion that the mortality was at least one out of every four, or twenty-five per cent. Fourteen physicians were attacked, of which number three died. In Elmore's band thirteen had the disease, of which four died. Seventy-one of Elmore's regiment were treated, with a loss of seventeen. These, perhaps, form the best basis for a correct conclusion of its mortality.

The prominent symptoms were augmentation of the pulse, irritability of the stomach, pain in the limbs and spinal apparatus, great tendency to congestion of the head, injected conjunctiva, membranous formation on the gums, nausea and sometimes vomiting; the general character of the tongue was white with red edges, which, during the progress of the disease, generally assumed more of the characteristics of our low grade of typhus. Thus, then, the symptoms do not materially differ from those peculiar to other epidemics of the same disease. The duration of the fever, however, ranged from one to seven days, and in some instances, even longer. In the ordinary course of yellow fever patients are frequently discharged on the third or fourth day, while in this most of the deaths occurred on the seventh or eighth day. The rapidity with which it assumed the phases of inflammatory, typhoid and congestive, gave it a marked peculiarity; convalescence has been invariably tardy, unusually so; though few if any cases of organic diseases of the lungs, liver, spleen or other internal viscera, have occurred as sequelæ.

Among the troops removed from the city at the commencement of the epidemic but few cases have occurred, and these were traceable to their persistency in visiting the city; while at South Battery and Fort Scurry, where the rule of non-intercourse was strictly adhered to, not a single case occurred, although these points are low, damp and unhealthy, surrounded by stagnant pools, and subject to whatever influences might arise from the disturbance of the soil, and in close proximity to several fatal cases.

Numerous cases have come within my knowledge, of persons leaving the city, after having contracted the disease, where the disease ran its course with the same virulence as in the city, but invariably terminated with the individual subject, and was not communicated to other occupants of the same house, although they remained within a few miles of the city. Hence the inference is conclusive, that there must be certain atmospheric constituents, combined with local visitations, which might remain innoxious through all time, without the introduction of an exciting cause to rouse it into action, like the "waves after a storm, not dead, but sleeping." The introduction of the case from Tampico was but the spark of fire applied to the magazine already prepared for the explosion; it found a kindred atmosphere and ample infected matter to give it new life and wake it into a fearful pestilence.

W. H. Farner.

DR. LABADIE'S REPORT ON THE EPIDEMIC OF 1864, AT GALVESTON, TEXAS.

As yellow fever is a disease of very great prostration, the convalescent may over-exhaust himself, is liable to contract another disease, which soon assumes a controlling influence over his nervous system, and often proves fatal. Hence the frequent cases of congestive fever, that prove more fatal than yellow fever. I have met with no congestive fevers this year, but have had cases of intermittent fever to run into yellow, and again into intermittent. On the 16th of September, Charles Hagerman, who had just returned from Buffalo Bayou with intermittent fever of two weeks' standing, sent for me. I found him much debilitated and depressed. He told me that he had had a cold chill every night for two weeks. He was fifty-three years old and a resident of Galveston for twenty years. A gentle cathartic was given. On Saturday the 17th I found him better; he had a light chill and some fever. I gave him ten grains quinine in four doses, to take during the day. On Sunday a message was sent for me to hurry to his bedside. I found him in bed, and as yellow as a ripe orange; he was so from head to foot; pulse tremulous and very weak; cold clammy sweat. I ordered friction with mustard, sinapism to his arms and legs and chest; warm stimulants were poured into him, and in two hours he became warm and more conscious. The chlorine mixture was given, and he was treated at once for yellow fever, as I could make nothing less of it. The epidemic fever had taken full sway during Saturday night. At my third visit, on Monday, I found him composed, color less yellow, free from pain, pulse 110, with a slight headache; treatment continued as before. On Thursday I found him depressed; he refused to take anything; friction with mustard, and sinapism applied to his feet and wrists, soon restored him to more cheering looks. The chlorine mixture was faithfully given every two hours for about eight days. His appetite soon increased. Some tonic bitters was given him on the sixth day. He was soon able to be out of his bed, which he had not left in five days, when again a regular tertian ague visited him, which was finally broken up by a pill that I have been making and using for thirty years, that never fails to cure in twenty days the tertian ague.

A similar case, as to a long residence, is that of Mrs. S. Allen, who, in 1839, was but a child of some five years. She was brought up among us, and generally enjoyed the best of health. She is the mother of three healthy children, and had passed through every epidemic that has occurred in this place. In the first part of October she was taken down with yellow fever, and with my usual treatment she recovered in about eight days, rather slowly, but as her little son had just had the black vomit, I did not wonder as to her slow recovery. If yellow fever is a fever of acclimation, then no one can be called acclimated without its ordeal. What causes the rise and progress of this disease is a question hard to answer. Some say it is caused by a marsh miasma under an atmospheric pressure of over 90° Fahrenheit. Others contend that it is a peculiar subtle poison that explodes in the air, like an inflammable substance, communicates itself to certain points, and those who may happen to inhale or swallow more or less of it come under its influence after a certain number of hours, to as long as twenty-four days, which, when exploded in the stomach, or is absorbed by the blood from the lungs, finds its seat of infection in the stomach, which it first inflames to such a degree as to cause those violent pains witnessed; leaving its impress there, it soon leaves to do its work. The system becomes so depressed, so exhausted, that all the muscular force is gone; the walls of the stomach no longer protected by the muscular fibres, a degree of relaxation follows; the capillary vessels,

relaxed, soon bleed; this blood mixing with a rank acid of the stomach or bowels, they neutralize each other, hence chocolate-colored vomit; but if this blood meets a strong acid it becomes black, and perhaps carbonizes at times in small particles, hence black vomit more or less profuse.

Since the first epidemic in 1839, in this place, I have closely watched to ascertain its origin and progress. Every time it has visited us, our sister city, Houston, was also visited from twelve to twenty days after its appearance here. Although communication always existed between the two places, yet it required twelve to twenty days to travel that distance. I believe it has appeared in Houston twice whilst we remained free from its scourge. What caused it is a question that no one has yet fully explained. That it takes its origin among us I believe that all old settlers will agree with me; hence quarantine regulations and laws must always become a dead letter. Our city fathers did once pass a quarantine law, and built a hospital on Mosquito Island, now Fort Point. By day and by night they had men and drays cleaning yards, alleys, etc.; every blade of grass was pulled up and carried away; never was a town more clean and nice. Whilst we were comforting ourselves in our happiness and certainty in our supposed security, and no steamship to arrive, as they had left for the north to be repaired, and no arrivals from New Orleans or any other port, a servant, German girl, in the employ of Mr. J. Berlocher, living on the Strand, was taken sick and died with black vomit before any one was aware of her real disease. She was a stranger, and had not been out of the house for weeks, and only about four months at this place, from Germany. About that time many were taken sick, and it went on increasing. The poison had inflamed all strangers and the atmosphere; our quarantine law became a dead letter. It spread out rapidly, destroying about four hundred lives before frost put an end to its effect.

A few years ago it broke out in one house on Tremont street, and before three days had passed two deaths were reported. On the following day seven cases were reported on the west side of Tremont street, and it went on as usual, doing its work of death. There had been no communications within two weeks previous. The first victims had been living here only a few months, yet it carried many natives to their long home, as well as some three hundred unacclimated persons. It is believed that yellow fever cannot be personally communicated; it must be inhaled; it is an atmospheric poison. If so, the strong Gulf winds that visit us at this season seem to be unable to blow it away. If it proceeds from the soil, we have seen the waters from the Gulf rise and wash over a great portion of our town to the Bay; much rain has fallen upon our streets and yards, filling every sink, washing the whole surface of the soil as clean as sand could be washed, yet the disease progressed in its direful work, steadily, as if neither winds, thunder and lightning, overflows, or rains, had visited us at all. If it is attached to the under sills and floors of our houses, (perhaps so, in a shape most unperceptible to the eye,) this matter or animalculæ may be carried from place to place in goods, clothing, packages, etc., and finding a suitable atmospheric pressure may easily multiply and propagate itself in the air; so it may go on increasing, advancing slowly from place to place, even contrary to strong currents of wind, and harbor in particular places to increase. In this belief quarantine regulations might be of service. This animalculæ, matter, or subtle poison, once inhaled, may be some days in the stomach or lungs before it takes effect on the system, hence a person may travel many days before he is taken sick; it matters little where he goes, it will do its work sooner or later. I have read of cases of black vomit occurring in Chicago being traced from New Orleans. I have seen cases in St.

Louis, of twenty-four days' travel from New Orleans, in 1828—some often twenty days after leaving that infected port, die of black vomit. To see new cases of yellow fever ten and even twenty days after the appearance of a white frost, sustains me in the opinion that it is not possible to know who has inhaled, or who has not inhaled the poison on leaving an infected place; and who can tell when this poison was inhaled. I dare say it will be difficult to contract the disease twenty days after a white frost. Doubtless a frost does destroy this matter, or this subtle poison, yet many times this mysterious and awful disease comes and goes we know not how. The present epidemic appeared first among unacclimated persons in Church street. Nothing unusual was perceptible during the Spring and Summer. The thermometer that I have had in my office for twenty years past did not on any day indicate higher than 88° Fahrenheit.

I have watched it closely, and examined it every day. I know that it did not rise higher. Thermometers, like watches, are scarcely two alike, yet I speak from one, because it has been my guide for twenty years past. Many years it has stood from ninety to one hundred degrees, yet no yellow fever appeared among us. When writers say it requires a heat of ninety degrees and upward to produce the poison, there must be other conditions in the atmosphere to bring it about or to cause this matter to hatch and multiply. Does it not require a peculiar state and exposure to the atmosphere to cause weevil to breed in a grain of corn or in a barrel of flour? Some years these are more in number than usual.

If it is in the air or atmosphere, has it a centre to hold itself; cannot the strong Gulf winds that we have blow it away? We know they have no influence over it whatever. The present epidemic has passed away from us without a frost, yet we witness no peculiar change in the season from any other.

Every Spring inquiries are made whether or not yellow fever will make its appearance in Galveston. No one can give an answer by any calculation whatever. It has appeared for several years in succession, after hard frosts and winters; it has followed or continued its deadly march after very mild winters; hence we have no possible means to tell what portion of the South will be exempted. It comes without giving warning, and we only know it is among us by several cases being taken down within a week, and by its unmistakable marks on the body after death, and by black vomit. Though two or three sudden deaths may happen in the early part of August or September, yet so great is the desire to deny its presence among all classes, that I regret to find a greater disposition to do so among the bulk of physicians; an incredulity very blamable in itself when we consider the great excitement its announcement spreads in the community.

The people look to their physicians to guide them in the enjoyment of health, and to write likewise—men devoid of selfishness—to point out diseases as they exist, as well as to investigate their nature and malignity. It is a difficult thing to reconcile the various opinions about an epidemic among our physicians; they are generally the last to admit the fact. How is it, and why is it so? To me it seems wise to foresee danger and to avoid it. There can be no wrong to point out the danger if any may happen. From the Houston papers it seems that it has not been settled among her physicians that there has been yellow fever there, although about fifty deaths have been reported with the so-called bayou fever. When yellow fever exists in this place, or in Houston, turning the corpse yellow, it is nothing less than yellow fever, for it is easy enough to distinguish a case of icteric from yellow fever. With us, what is known as bayou fever is only an intermittent fever, under the tertian type.

If it proves fatal, it does so under other forms, hence it may be absorbed in the grasp of yellow fever or of congestive fever, either one very fatal.

That yellow fever appears under the symptoms of bilious intermittent form is too frequent to doubt. All such cases of yellow fever that exist I take as genuine, for in a day or so it becomes too apparent to doubt. At first diagnosis quinine might suggest itself, but this valuable medicine I surely do not give if I suspect the case, because I have in the chlorine solution the very proper antidote of that justly dreaded yellow fever poison. The good it effects in the system is so apparent that every dose given goes to check the effect of the poison, decomposes and destroys it entirely; though the whole tongue may change into one coated yellow, yet it soon assumes a natural appearance, as the fever abates and pulse falls below ninety strokes. At this stage I urge my patients to take food of their own selection. This I do to counteract the great loss of strength that must take place after a fast from two to five days. When the fever is left unchecked and runs its course, the patient enters on the second stage, which is always one of the greatest prostration. If this state of exhaustion is left to itself, the patient must die.

It is in this second stage that the utmost care must be bestowed, by the best of nursing, as to frictions, and frequent applications, if there appears the least disposition to faint. It is this second stage that decides the fate of the patient, hence the great amount of nursing and watching requisite to enable the victim to struggle one or two days longer, to victory, or defeat, or convalescence. This stage I always look upon as the most important in the treatment. I am glad to say, under the chlorine treatment I have found but little trouble to carry my patient to the third convalescent stage. I must, however, say, in candor, that these cases of black vomit, or treatment with it, have been to me of no small amount of solicitude, watchfulness, and close attention to these unfortunates. I feel myself amply rewarded for my success in this stage. Saving nine out of nineteen real black vomit cases is a just pride to me.

With good nursing, without quinine and calomel, I have safely carried cases, and some of them very discouraging, to a happy state of health, as many among us will testify. During the first and second stages I enjoin a quiet horizontal position of body. I only require the head to rise from the pillow to enable the patient to swallow; he can change position from side to side, or roll on his bed if necessary; but I do not allow him to rise, and I find the more quiet and submissive a patient becomes, the more hopeful is his case. It seems of little importance how the first stage passes or progresses, as it is often impossible to check the fever; it then runs its course, but then it leaves the impress on the stomach more or less severe, and if no black vomit sets in, either from the thorax or bowels, a recovery is soon effected with proper care with one's self; but if black vomit supervenes, the result is generally bad. Many cases, however, become fatal without "black vomit," which might be attributed to want of proper nursing, or to medicine improperly taken; that the secret of success is in securing the proper aid and skill in the second stage, I am thoroughly convinced; that the bowels once relieved of their contents, in the first few days, remain unaffected, is very true. Calomel, when bile predominates, plays a very important part. I never vomit in this disease, but always avoid it if I can. In the third stage I administer quinine or sulph. cinchona in small tonic doses, or give some of the simple bitters, such as tinct. cinchona, comp. surpentara, gentian and quassia, as the case may admit, with a very happy effect.

These hasty remarks I write in the hope that in any future epidemic I may be

able to see the chlorine mixture universally adopted by every physician who may have at heart the welfare of his patients, and who is not too much fastened to one mode of proceeding, and too many odd notions.

The great success I have met with in the use of chlorine and creasote fully sustains the reputation these two medicines should have, and a preference should by all means be given them. In one hundred and sixty-nine cases free of black vomit, which I have had, I lost none—some of them very troublesome to manage, and these were slow to recover. The timely administration of the creasote, with the often repeated application of sinapisms have, I believe, prevented bleeding, although the nose and gums bled in some cases, yet no black vomit appeared, which I must attribute to the creasote and mustard.

On the 22d of November a white frost, producing ice, appeared. As a general thing, October always brings a frost over the bay, but does not always do so here.

N. D. LABADIE, M. D.

[Dr. Labadie was not a regular graduate, but a druggist, but was a conscientious, good man, and had seen every epidemic, from 1839 to 1867.)

REPORT OF DR. J. M. REUSS.

Indianola, situated on the west side of Matagorda Bay, about eighteen miles from the sea-coast, a town of about twenty-two hundred inhabitants, including Old-town, about three miles above, is almost entirely surrounded by salt water, being on a sort of peninsula, formed by Powdertown Bayou on the southwest, a narrow outlet of the bayou running south to north, the so-called Blind Bayou northwest, and Matagorda Bay east of the town. In its rear are flats, which, as also parts of the town, are subject to overflow. These flats, as well as the bayous in the rear, were overflowed before the occurrence of yellow fever, by fresh water, in consequence of continued rains, the water running in from the surrounding prairies. This brackish water, as well as the clearing and filling up of the streets in May and early part of June, also the making of a road by the military to their camp, and throwing up a bank, and digging ditches on both sides of this road, by which very offensive emanations from the ground spread by the prevailing south winds over the city, made, no doubt, the atmosphere a very good vehicle for the propagation of epidemic disease, and it required but the germ of yellow fever miasm to inaugurate a fearful epidemic. As at Galveston, this disease never appeared before its being epidemic in New Orleans and imported from there; only in 1862, when two steamers running the blockade from Havana arrived at Lavaca in August; the disease was brought here by soldiers, who had visited these vessels. It then broke out about the end of September. In 1867 it appeared about the 20th of June, shortly after the arrival of a small craft from Vera Cruz, where the fever was then raging. Second-hand blankets, which were brought from there and sold here at auction, were considered the source of infection. Indeed, it was proven by sworn statements, that two young men from the country, who had examined these blankets, and who had only been in town a day, were attacked by yellow fever after they returned home, and one died of black vomit. A negro woman, nursing one of them, also died of well-marked symptoms of yellow fever. This occurred even before the fever broke out here. If this

vessel did not bring the fever here, it must have come by a lady from New Orleans, who took sick at a hotel. I did not see the lady until she was almost well; cannot, therefore, say anything more, but that, from the description of her case, I suspected yellow fever. I did not know that there was yellow fever at New Orleans then, until I saw it stated in the *Galveston Medical Journal*, of February, 1868, and of course excluded that idea at the time.

In fact, I could not believe at the time that this epidemic was yellow fever, it occurring so early and being so different a type from all I had seen before, until I had seen five or six cases of indisputable black vomit. Already, a week or two before the outbreak, I had several cases of fever of a rather continued form and more malignant type than the common climatic fevers of this region.

The first death occurred on the twenty-fourth of June, and in less than a week the whole business part of the town was struck down, as by lightning, there being no less than one hundred and twenty-five to one hundred and fifty cases taken during that time, out of a population of less than a thousand.

In this part of the city it had always broken out before. But as sudden as its onset was its decline in that locality. It reached its acme in about two weeks, and after the 15th of July but very few isolated cases occurred in the central part of the city, spreading, however, in all directions, to the less densely populated parts, and then traveling house by house slowly, until it reached the suburbs, where it lingered about for over a month.

Persons nursing the sick for weeks, day and night, would seldom be taken until it came near their habitations or got into their own families. It would seem, then, that the infecting agent is most active at night, and when persons are asleep. Several nurses, active day and night, never took sick until their patients became convalescent, and they got rest and sleep in infected houses.

At Oldtown, three miles distant, to which place the epidemic traveled almost house by house, some of which were separated by an interval of half a mile, it broke out on the 13th of October, weeks after the last case had occurred here, although the inhabitants of that place were in daily communication with this city during the raging of the fever, they coming here in the morning and going back in the evening.

There occurred only eighteen cases out of two hundred inhabitants, and it lasted but two weeks, owing, no doubt, to the absence of unacclimated persons. Only six adults were taken, all unacclimated.

In this place, with about two thousand inhabitants, no less than five hundred and fifty to six hundred persons must have been sick, although no certain data can be given, owing to the sudden outbreak and rapid spread. Of six physicians then here, four were taken sick; all recovered.

The number of deaths from the epidemic may be estimated at from seventy-five to eighty-five.

In my own practice I have treated two hundred and sixty-three cases, and about thirty in hospital; of the former, with a mortality of a fraction more than nine per cent. This percentage might have been even less, but for the impossibility of giving due attention to all cases, as in the height of the disease but two physicians were able to practice. In hospital practice the result was not so favorable, from various causes, incident to all such institutions. Of the thirty cases six or seven died.

In general I consider the epidemic of milder type than we ever had before,

compared with five previous epidemics. No acclimated persons were taken, although some old citizens died during the time, and even with some symptoms of the prevailing disease; they were in all cases broken-down constitutions, and affected with chronic disease of some duration.

In the beginning of the epidemic the temperature was unusually high, the atmosphere sultry, and a marked tendency to congestion of the brain prevailed. The disease was very rapid in its course, some dying suddenly, as if sunstruck, in cases even that looked mild in the onset, and when such an issue was not at all expected.

Particularly from 10 A. M. to 4 P. M. patients had to be closely watched, and the fatal tendency to the brain rigidly counteracted. Delirium then was frequent, the fever at its highest, and all bad symptoms exacerbating. That the high stand of the sun exerted a dangerous influence I do not doubt. A boy of twelve years, lying sick in a room which was unceiled, having a window east, became delirious every morning at about eight to nine o'clock, until I moved him into an opposite room, lying west, where he remained quiet until the sun had passed its zenith, when he had to be removed back to the former room. This lasted almost a week, until he was quite well.

After the epidemic had reached its acme the character changed to a more slow type; a tendency to congestion of the stomach, hemorrhage, and general sepsis appeared more frequent. While in the beginning of the epidemic, when black vomit occurred, it was rather of less quantity, and in quality of a more frothy, tenacious, bloody appearance, it now assumed the character of coffee grounds, and was thrown up in great quantity, sometimes for forty-eight hours. Patients now died oftener from exhaustion than hyperæmia. Symptoms of torpor were more frequent than of sthenia. Death occurred mostly on the fifth to the seventh day.

Contrary to former epidemics, there was a tendency to perspiration with a very marked peculiar offensive smell, of a musty kind, often so strong that a yellow fever patient could be detected at a distance of many yards. The same smell was perceptible on the flats in the rear of the city, and sometimes penetrated the houses at night to such an extent that fumigations had to be resorted to.

There was, in all cases with tendency to action of the skin also a considerable vesicular rash, sometimes literally covering the patient, particularly on the neck, chest and back, resembling the eruption of miliaria or hydra, which was considered rather favorable, except where it assumed a petechial character. The average pulse was rather high, in most all cases above 100. Remissions not unfrequent, though well marked.

Black vomit occurring in all stages, not always fatal, particularly in children.

I saw one case in hospital with black vomit of an evident intermittent type (tertian), the patient throwing it up every other day for several hours. Recovered in six days after taking large doses of quinine and tincture of iron. During intermission, the patient was quite well, walking about the ward.

Treatment in general was eliminative and expectant; in mild cases, diaphoretics, as liq. ammoniæ acetat., or liq. potassæ citrat., with digitalis or veratrum in cases with higher vascular action, with hyoscyamus in cases with nervous excitability. In asthenic cases no treatment would avail. The powers of nature failing from the start, indicated a death blow. Ice was freely allowed by me, found grateful, and did no harm; acted to advantage in cases of gastric irritability. Ice was applied to the head in all cases with prominent cerebral symptoms, as well as cups, leeches,

and mustard pediluvia. Mustard wherever pain was felt, as also in local congestion, acted well.

Creasote and chloroform seemed to be of great benefit in cases of black vomit, or where it was apprehended. Alkalies, such as lime-water, with the addition of a little camphor, subdued gastric irritability, flatulency, and greenish acid or bilious vomit of the second stage. The bowels were acted upon by enemata or simple aperients; mercury was only given in cases with foul tongue and offensive breath. Quinine was exhibited in occurring remissions, or after the fever had somewhat subsided. I regarded it as beneficial in preventing relapses, which were frequent and easily brought on by imprudence or excitement, often on the seventh, or even as late as the fifteenth day.

I have here to state that several cases occurred where patients had a second attack after seven days, almost to the hour, after having been convalescent from a light attack, and even up and about, of which second attack they died in less than twenty-four hours.

Persons after they got through the fever enjoyed, usually, good health, even more so than before.

I omitted to state, that much benefit was derived from cold ablutions of the skin, when there was much preternatural heat and perspiration wanting. It was very grateful to the patients to sponge them with very cold water frequently, which often brought on a decline of the fever and perspiration when all other means had failed. So did the cold sheet, in some very severe cases. Forcing patients to perspire by hot teas, hot bottles or bricks, and much covering, was very injurious, and cases are not very rare where patients were handled by the nurses in the old accustomed way of former epidemics and put through (but forever). Such treatment always induced delirium, and patients did much better when left to nature. It was particularly dangerous to children, who, with but few exceptions, got well without any interference at all. There were several cases here which were given up and commenced improving from that time. But very few children died. Although many new persons came to this place after the epidemic ceased, and many returned who had left at the outbreak, yet none took the fever after the 1st of August. A few strangers took sick after that time, but they invariably had contracted the disease at other places, coming from Havana or Galveston. In both places the disease was then at its height. They arrived sick or became so immediately after. This experience will contradict the frost theory. In former epidemics, cases after frost were frequent.

J. M. Reuss.

TOPOGRAPHY AND CLIMATOLOGY OF GALVESTON.

The City of Galveston is situated on an island of that name, and is at the east end. It was founded in 1836, just forty years since. The island was occupied by Captain Lafitte in 1812, and there were a few houses or shanties on the island at that time, near the present Catholic college. There was a ship channel just east of the City Hospital. The island on which the city is built is about thirty miles long, and from three-fourths to three miles wide. It is separated from the main land by Galveston Bay. The city is just in front of the mouth of the Trinity River, and the mouth of Buffalo Bayou is just east of the city. The island is formed by

deposits from the Brazos, Buffalo Bayou and Trinity River. These give rise to the channel in front of the city, and cause the bar just east of the city. The city, in 1838, when the yellow fever first appeared, was built along the strand, and back of this was a low flat place, covered by water in wet spells. The houses were built on a shell bank, running to the water, which is now Mechanic street or Avenue C. Some of the palings are now seen sticking up just above the ground, near the old Washington Hotel, now Merchants' Exchange, where all the old houses have water under them. Along Avenue D., or Market street, even up as high as the New Tremont Hotel, many floors have been taken up and sand filled in up to the present grade. In portions of the island the subsoil is a red clay, evidently a deposit from the Brazos. Where the city is situated it is a dark sandy loam, mixed with sea-shells of every variety known to the Gulf. The surface is covered in many places with pure sand; and the south side has large sand banks that have been thrown up by the waves and the south wind: the north side is shell, sand and mud. The whole was crossed in various places by bayous with oysters in them; and between these, running lengthwise of the island, are ponds of fresh water. These sloughs were at times flooded with salt water when there were very high tides, or when the wind had been blowing from the east; and the island has been overflowed by sudden northers springing up when the bay was full of water, and there was a high tide in Buffalo Bayou and Trinity, the bar leading into the gulf not being wide nor deep enough to give free passage to the water from the upper bay and rivers leading into the bay. At such times, if there is a rise in the Trinity, a great deal of drift wood is thrown upon the island, with bark, chips, brush, weeds, and grass. Again, when the Brazos is high and there is a south breeze, we have much drift driven on the southern side. These two conditions supply much of the wood used in Galveston, and nearly all the wood used down the island, besides rails for pens and fencing. These two counter-currents, no doubt, formed the island; and from its past history, I infer that the island is gradually extending both north and south, and the island itself is becoming firmer every day. The subsoil, in many places, is stiff clay, and is not much affected by the tides; and on both sides this extends off to the depth of several fathoms, so gradually that persons bathe on both shores with impunity who cannot swim a stroke, and drays and carriages go out on the beach. This is particularly the case on the gulf side. On the bay side the water gets deep much sooner, and in many places there are quicksands and soft flats. The ship landing is just north of the city, on the north side of avenue A., for the length of two miles. No ship of any size can come nearer than one hundred yards of the main land of the island, and must anchor in the channel made just north of the city, or come to the present wharves, dredged out. The present city is spread on a space of two miles east and west, and from the bay side to the sand banks. The city is laid off nearly due east and west, north and south. Broadway runs through the centre, and Bath Avenue nearly north and south. The present city is mostly built east of Bath avenue; but of the portion east, about one mile and a quarter is settled; and west, about three-fourths, to the present railroad depot and gas works. Just south of Broadway, near the Catholic German church, was a large pond filled with all manner of filth, running up into Broadway, near the street running south of the Custom-house and Court-house to the beach. This was the commencement of Bayou McKinney, which runs south southwest for several miles, and, when flooded with fresh water, bursts into the gulf on the south side of the island. This was filled up to grade with sand, in 1874, and is now well drained to Thirty-eighth street, west.

This bayou is also connected with a wet, weedy marsh, just southwest of the city, coming out from the bay on the north, and running just south of the graveyard. These bayous furnish many mosquitoes to the west end of the island, and have prevented this portion of the city from being settled so fast as the east. South of this bayou is a sandy ridge, where many of our most wealthy citizens now live—this portion of the city having been built up in the last twenty years. On Bath avenue, just east of the convent, was a large fresh water pond which, I believe, never dried up. Just east of Tremont street and north of the Waters' House, was also another fresh water pond that scarcely ever dried up. This was of considerable extent, and completely surrounded the Waters' House on the northeast and south. This pond was dried up in 1864, 1867 and 1870, when we had yellow fever here; the only times I have seen it dry. These various ponds and bayous were filled up and built on. Old bone, leather, sand, mud, and old tin were used; and even the weeds and trash from the city sweepings. The body of these ponds was quicksand, and could not be crossed by horses or carriages, unless paved with brick, trash, etc. There were many senna bushes* growing in the streets and on the sides of these ponds. These were very offensive and caused a sickening sensation, and gave protection to thousands of mosquitoes.

There are many beautiful flower yards and shade trees. The cotton-wood grows the best and largest. But we have the black locust, the honey locust, and the china tree. Magnolia grows well when planted, and also the pine. Spanish cedar seems to be a favorite, as it is planted around the fences, near wet places. We have every variety of flowers and shrubs, and the various kinds appear to grow well. Oranges, lemons, bananas, figs, and guavas grow well; but bananas and guavas are too delicate, and are killed down every few years. They were all killed in the winter of 1863, '64. Every manner of vegetable grows well, especially melons and potatoes, both sweet and Irish; and they are as easily cultivated as anywhere else in the world. The midsummer is too hot and dry for them to do well; but the winter, spring and fall vegetables are usually abundant and cheap. There are no large trees of natural growth; the whole island was prairie in 1838, but now we have some large live oak, and they grow well. But in various places we have the mezquite and wesachee. Dewberries and blackberries grow wild; also, the wild cranberry.

Meteorology.—From the various records I can procure, I give a table of the medium temperature, etc., which I have carefully compiled up to the 1st of January, 1876. It will be seen by this table, that the city is subject to extreme and sudden changes, though the thermometer never goes very low or very high; but it often makes changes of forty degrees in twenty-four hours. The wind is equally changeable—from a calm to a blow, almost a storm. Some months we have six inches rain, and others scarcely a line. The wettest months, September and March; the driest, October and May. During the summer months we have usually a stiff south breeze from 10 A. M. to 4 A. M. the following night. We have heavy dews when the breeze calms, and it is not cloudy.

The People and Houses.—Galveston is a perfect Babel. About one-fourth of the inhabitants are Americans and English; another fourth is German; one-sixth French; one-sixth Spanish; one-fourth negroes, now Freedmen; the remainder from all nations. The houses are mostly of wood, especially the dwelling houses, and of one and two stories. They are not closely built up, there being not more than

* Senna Marylandica—Senna Lancifolia.

four houses on one-half block, and often only one. The streets are wide, being eighty feet, with an alley running through the blocks, east and west. The style of architecture is as varied as the nationality. The habits and customs are also varied as the countries from which they come. The American eats pork and beef, and drinks whisky, brandy and gin. The Germans eat beef, pork, cabbage, or sour-krout, and drink Rhine wine and lager beer. The Irish and English eat beef, pork, peas, Irish potatoes, and drink anything, but principally whisky, porter and ale; French eat sausages, fish, eggs, milk, cheese, beef, and drink French wine and lager. The negroes eat anything and drink anything. All classes use tobacco. The Americans, principally, chew; the Germans smoke pipes; French and Spanish, segars; negroes use everything. All dress alike, and according to their purse. Germans sleep on and cover with feathers; Americans, mattresses, and cover with blankets; French, mattresses, and cover with quilts and comforts; negroes sleep on cots, and cover with quilts, blankets, and anything. All live in houses according to the rent they have to pay, and their ability to pay. The Irish are the most gregarious, and live in the cheapest houses, except the negroes, who are now living in crowded huts that white people will not live in.

The Streets, Alleys and Yards.—Many of the streets were filled with water from week to week, but now are better drained; but few have much or deep mud. The alleys are worse than the streets, and are the receptacles of all the filth of the house, kitchen, yard, and even, often, the contents of privies. It was impossible to walk any distance without getting your nose charged with effluvia, and often your feet filled with the fecal matter of horses, cows, goats, hogs, dogs, and *dejecta hominis*. Often dead cats, dogs, hogs, and goats lie for days and weeks, with rats, mice, and old bones, fish and fowls. But things are much better now than they have been. The yards of many of our citizens are as bad as our alleys; and I really do not believe there is a city in the world that was more neglected than ours in this respect.

Cisterns and Wells.—All classes use cistern water; principally brick cisterns, about six feet deep, covered with wood. The wells are brackish, and cannot be used for drinking. Well water is used in scouring, and sometimes, when cistern water is scarce, for cooking. The horses are usually watered from the cisterns in the centre of the streets; but they are not so healthy, nor do they thrive so well as those who have cistern water, as it seems to produce diabetes in them.

Diseases.—Galveston has no local endemic diseases, but is subject to epidemics of yellow fever and dengue, which are Southern epidemics. It is also subject to epidemics of rubeola, variola, and influenza. Cholera has never been epidemic, and perhaps never will be, as the citizens are compelled to use rain water. It can never be subject to intermittent fevers, for the same reason. Typhoid fever will always prevail, from the small rooms and the constant influx of immigrants. Phthisis pulmonalis is unusual, unless imported. Pleurisy and pneumonia are common, and will continue until we have closer houses and better built-up streets. Rheumatisms and neuralgia will always be common, from the sudden changes and their extreme range. Catarrhal and bronchial affections are common, and will probably remain, as our changes are so sudden. Ophthalmias are common, and will doubtless increase, from the bright sun and sparkling water, gas lights, and tin roofs. Cutaneous diseases are prevalent, and we cannot reasonably expect any improvement, from our isolated situation and exposure to salt spray and salt dews, and want of milk diet.

What Diseases I have Seen in Galveston.—Since I have been here, thirteen years, I have seen two epidemics of rubeola; two severe epidemics of febris exan-

thematica arthrisis (dengue), 1863 and 1873—three years it was sporadic, 1865, 1866, and 1870; two terrible epidemics of yellow fever (febris typhus icterodes), 1864, 1867, and sporadic cases, 1866, 1870, and 1873. The other years I have not seen or heard of a case. I have no recollection of a case of intermittent fever occurring on the island that I could not trace to a foreign source. I have seen, every year, cases of febris continua, without sudaminæ or petechiæ. I have seen sporadic cases of typhoid fever every month in the year, and every year. I have seen several epidemics of pertussis in 1866 and 1870. Sporadic cases of diarrhœa hemorrhagica (bloody flux) all the time. Rheumatisms and neuralgias every month. Tetanus every year, but more frequently in 1863, ten cases. Frequent cases of hæmoptysis, with apparent complete recovery. I have not seen a case of uncomplicated dysenteria. Poronychia was epidemic for nine months, in 1865. I treated over one hundred cases; sometimes as often as seven in one day. I have been at a loss to account for this, unless the hands became much softer during the war, and both male and female have been forced to perform hard labor since its close; but this is not satisfactory; for I believe that a full proportion have been negroes, who did not undergo any change in respect to the use of their hands; hence, I must look to the change of diet: the return to sugar and coffee, tea and chocolate, and substitution of flour for corn bread. Some one or all of them may have conduced to this result. I have seen cases of variola every year, but no epidemic. In 1866 I saw four cases and one death, two distinct and two confluent; one from New Orleans, one from Havana, and two occurring in the city; the two occurring in the city from the case from New Orleans; three negro women and a white man. I saw three cases of scarlatina in 1863, three in 1864, a few in 1873, one death each. I believe calculous diseases are very rare in Galveston, and I may say even in the State. I have treated two cases by operation, one a white boy from Harris county, and a negro girl from Colorado county. Dr. Lancton brought one case to me in 1863; I believe he was a German. The gravel was in the urethra, and was removed through the urethra with the pocket case scoop. I do not believe calculous diseases will ever originate here, as we are compelled to use rain or condensed water.

REPORT OF DR. S. W. WELSH.

The city of Galveston is situated on the east end of the island of the same name, lat. 29° 19″, long. 95° 01″, and is the chief commercial city on the seaboard of Texas. Its mean elevation above the surface of the Gulf does not exceed seven feet, and portions of it are liable to inundation when the waters of the Bay are moved by violent east and north winds. Observations have not been recorded of sufficiently extended periods of time to fix with precision the mean temperature. The following averages of temperature for Galveston, for the year 1842, are derived from Blodget's valuable work on the Climatology of the United States, viz: Spring 77° 23″, Summer 87° 67″, Autumn 70° 60″, Winter 60° 44″; mean temperature for the year, 73° 99″. The south wind, directly from the Gulf, is balmy, with a clear sky. The east and northeast winds are harsher and very humid, and the north and northwest winds, which begin to blow in October, cause great and sudden falls of temperature.

Preliminary to a history of the recent epidemic of yellow fever, I will briefly allude to the only feature, perhaps, of the medical topography of Galveston which is particularly worthy of mention in connection with the origin and progress of this mys-

terious disease. In the rear of, and parallel to the principal street, the Strand, which lies along the margin of the Bay, originally existed a long, narrow morass, subject to overflow from the tides. Beyond this, the surface of the ground is higher and drier, gradually ascending to about midway the width of the island. Over this morass, in which a great deal of filth was at an early period suffered to accumulate, and which has been but little elevated from its original level, is now built the most dense and compact portion of the city, constituting Mechanic and Market streets. The buildings, too, are very generally of wood, extremely old, and with little or no elevation above the surface, their decaying foundation timbers lying next to, and often partly under ground. It may be remembered that, according to all observers of the epidemics of yellow fever in Galveston, the disease had appeared first, and proved most rife and malignant, in this quarter of the city.

Galveston is not visited by yellow fever annually, nor, indeed, with any degree of regularity. Intervals, varying from one to five years, have elapsed, during which its inhabitants are lulled into a fancied security, and its population is increased from abroad—when suddenly, without any obvious cause, this fearful scourge makes its appearance, exciting terror among the unacclimated, and overwhelming the city with gloomy forebodings—alas! only to be too fully realized. The season of its visitation is singularly constant in Galveston, the period fixed by observation for its outbreak being from the middle of August to the middle of September, rarely appearing before or after. The recent memorable epidemic was exceptional in this, as in many other respects, having appeared earlier than usual. It is not the purpose of the writer of this article to attempt a full account of the epidemic in Galveston, but only to portray some of its more prominent features and incidents. The first undoubted case of yellow fever which occurred, it is generally conceded, was derived from Indianola, a town situated on the western coast of Texas, and with which Galveston is connected by almost daily steam communication. A young German, named Moller, a resident of Baltimore, who had been traveling in western Texas, passed through Indianola, where yellow fever was then prevailing (it having broken out there just after the arrival of a vessel from Vera Cruz with some cases on board), arrived in Galveston on the 28th of June, was attacked the following day, and died the 3d of July, with black vomit. This was the first case that fell under my own observation. It is proper, however, to state in this connection, that a case was reported at our City Hospital as early as the 22d of June, which, if there was no mistake as to its character, would take precedence. The subject was direct from New Orleans, where the disease had existed in a mild form from early in June, there occurring only about nine or ten cases per week. I was shown a well marked case in the wards of this institution on the 4th of July, and on the 5th, two cases at the Federal Military Hospital, none of whom, I was informed, had been absent from the city for several months previous. Two cases, I should mention, occurred during the week following; the first among the inmates of the boarding house occupied by the case from Indianola. A few days after this, rumor was busy at work, and cases were reported in distant parts of the city, having no apparent connection with each other. I inquired among the physicians as to their dates and localities, and could trace no connection among the cases. They seem to have been sown broadcast over perhaps a mile square. I do not propose to discuss the question whether this epidemic occurred from a local cause, in connection with a peculiar constitution of the surrounding atmosphere, or from a morbific cause, imported from abroad. While its origin would not seem to be connected with any particular meteorological conditions adequate to account for the dis-

ease, it is unquestionably true that the climatic conditions were highly favorable to its spread—given a starting point. The month of May was temperate, showery, pleasant, and remarkably exempt from all febrile diseases; nor was there anything to be observed in the type of diseases to foreshadow yellow fever. June, however, was a month of uninterrupted hot weather, the thermometer ranging daily from 85° to 90°, with a breezeless and stifling atmosphere. Towards the close of the month, from the 20th of June to the 5th of July, a period of two weeks, there were heavy falls of rain daily, literally flooding the streets, and accompanied with unusual electrical phenomena. In the intervals, the sun shone brightly and with intense heat. It should be remarked, that our municipal authorities had shown, for several weeks previous to the epidemic, unusual activity in cleansing the city. Everything seemed to have been done which prudence and foresight could suggest, to ward off the scourge.

The foregoing statement includes, so far as I know, all the essential facts connected with the origin of the recent epidemic in Galveston. By the end of July the disease was widely diffused over the whole city, and was, in the true sense of the term, epidemic. Its ravages increased till the 8th of September, at which time the disease attained its height, as was shown by our mortuary lists, when it slowly, but steadily declined, till the last of October, when it ceased to be epidemic. There continued to occur sporadic cases throughout the months of November and December, the last case being admitted into the City Hospital on the 31st of December. The weekly mortality for fifteen weeks, commencing with July 27th, and ending with November 9th, according to the reports of the City Sexton, was as follows: 14, 65, 162, 159, 182, 172, 142, 73, 40, 28, 24, 13, 5, 8, 6. This statement will exhibit the rise, progress and decline of the disease. The average mortality per day, from August 6th to September 18th, was 23, 34 being the highest, and 7 the lowest. This embraces a period of six weeks of the most active prevalence of the fever. The total mortality, as reported, to the middle of November, was 1134. The deaths that occurred afterward would swell the number to 1150. There are, perhaps, no means of arriving at a very accurate estimate of the whole number of cases. It may be approximately stated at about 8000, from the best data attainable. From the great influx of population into our city since the termination of the war, Galveston having increased from a population of 8000 to 22,500, there was an unusual proportion of unacclimated or susceptible persons. It is worthy of mention, that among our large population resident in the open prairie beyond the limits of the city (from two to eight miles), although there was a number of cases, not less than fifteen or twenty, contracted by persons visiting the city, not a single instance occurred in which the disease was communicated from the sick to the well—proving, I think, conclusively, that it is not communicable in a well-ventilated atmosphere. Certainly, on the other hand, too, all observation shows that the poison of the disease is most communicable, and exists in most concentrated activity, in densely-built and badly-ventilated portions of large cities, where the population is huddled together in filth and poverty.

The disease pursued a course so remarkable throughout a large part of our State, as to bring under discussion again the long neglected idea of contagion, which most members of the profession had regarded as obsolete. The constitution of the atmosphere certainly seemed to favor, in an unprecedented degree, the transmission of the poison from one point to another. However it may be explained, the fact is none the less true, that the disease extended not only to Houston, fifty miles distant in the interior, but to all the towns situated along the line of the Central Railroad and its

branches, as Hempstead, Navasota, Millican, Brenham, Chappell Hill, and to others, as La Grange, Huntsville, Anderson, twenty, thirty or more miles distant from the railroads. At all these points the disease prevailed with great severity and fatality, committing ravages far beyond decimation. *En passant*, I may remark, that under the head of contagion, two distinct questions are often confounded, viz: the contagiousness and the transportability of a disease. A disease may not be contagious in the proper acceptation of the term—that is, communicable by personal contact from one human body to another, like small-pox or measles—and still it does not follow that the germ, or *materies morbi*, may not be transported from one place to another in a vessel, or baggage car, or boxes of goods, or clothing, and there be propagated. From the history of the epidemic, it would appear that the popular and oft-expressed belief that a frost was absolutely required to put an end to—to arrest and extinguish—an epidemic of yellow fever, was falsified by the events of this season. There was, up to the 8th of January, more than two months after the cessation of the epidemic, no frost, no freeze, and only a few days of cool north wind. Yellow fever obeys, I am persuaded, certain laws as fixed and immutable as those which govern the growth, development and decay of organized matter. In the execution of such laws, the rise and fall of the thermometer can exert only a limited and temporary influence, can only retard and hasten the march of epidemics. Look to Havana, Vera Cruz, and other localities where yellow fever is indigenous and where the temperature never falls to the freezing point, and yet in those cities the disease, after having run its course, obeys the laws which must everywhere control it, subsides and finally disappears in the latter part of summer or the first of autumn, to return with renewed virulence the succeeding spring, run its destined course, and again subside as before. Let, there, then, be no deferring of hope till frost, but let us study and understand the laws which govern our epidemics, if we cannot banish them from our cities. If this error in the public mind could be eradicated, it would be relieved of much anxiety and apprehension with regard to the termination of our epidemics. The conviction, however, that a frost is requisite to destroy the poison of yellow fever is so firmly fixed in the popular, no less than the professional mind, that I fear no array of facts nor process of reasoning can divert it from this long-established belief. A coincidence is mistaken for a consequence, the subsidence of fever and appearance of frost having, as I believe, no connection as cause and effect. The late epidemic revealed certain striking peculiarities, different from any witnessed on almost any previous occasion. In the first place, it was more fatal, and ran its course more rapidly, when once fully developed, than in previous epidemics. The head symptoms were unusually severe, there being a strongly marked congestive tendency to the brain in a large majority of cases. This was, *par excellence*, the distinguishing and characteristic feature of the epidemic. In the epidemic of 1859 the writer well remembers that the proportion of cases in which the brain was attacked was comparatively small. Then the stomach and bowels manifested a peculiar irritability, always difficult to control, and often terminating in black vomit, or profuse and exhausting diarrhœa. The hemorrhagic tendency may be said to have stamped and given character to that epidemic. Then the suppression of the urinary secretion was also, I think, a more common symptom in the latter stages of the disease than in the past season, when, in the majority of instances, the kidneys continued to perform their functions up to the last moments of fatal cases. Whence this difference? The general character of no two epidemics seem to be precisely the same. Is it not reasonable to suppose that the peculiar poison of the disease expends its force rather

upon one organ than another in different epidemics? At one season the brain, at another the stomach, and at a third the kidneys seem to bear the onus respectively of the diseased action. In all seasons and at all times the great nervous centres seem to experience some profound change, some sudden departure from the normal state—hence the sighing, the sense of oppression, and of weight about the great ganglia—hence the intense neuralgic pains in the head, back, limbs, etc., in the earlier stages of the disease.

But to return from this digression. No acclimation, short of an attack of yellow fever, seemed to serve as a protection in this epidemic. Not only persons who had lived here for fifteen or twenty years, and passed unscathed through several epidemics, but adult natives, were in some instances severely and even fatally attacked. The number of second attacks was reported and believed to be much larger than in previous epidemics, probably ascribable to the fact that many of our young men had impaired or lost their acclimation by several years spent in Virginia or Tennessee, during the late war. Another striking feature of the epidemic was, that native children, heretofore little liable, were generally and violently attacked. The number of deaths of children under twelve years of age, as appears from our mortuary lists, was one hundred and three, certainly a very heavy and unusual mortality. Of twelve resident practicing physicians of the city, who were attacked, four fell victims to the disease. Of four medical officers of the army stationed here, three died.

Not only is the character of no two epidemics the same, as before remarked, but the same epidemic may, at different periods of its progress, exhibit different prevailing tendencies or phases. This was illustrated in the epidemic which forms the subject of this sketch. During the earlier part of it, the tendency of the disease was very generally, almost universally, indeed, to the brain; later, however, it showed a tendency, in many instances, to localize itself in the stomach or intestines, more rarely in the kidneys. The precise date of this change, though it marked an era in the epidemic, cannot, perhaps, be fixed. According to the observations of other physicians, as well as my own, it took place about the second week in September, or at least became a noticeable feature at that time. This change of phase was obvious and well marked, and formed the subject of comment at the time among our physicians.

The cerebral tendency, however, continued in the ascendant throughout the disease. The fever in many cases differed little in its symptoms from that of other epidemics. After more or less malaise, lassitude and sensation of fatigue, the disease made its appearance with a chill, amounting in a few cases to rigor. In many it was so slight as to be scarcely perceptible; in others, and a large number, it was totally absent. This condition, transient and of short duration, was followed by a state of febrile excitement, accompanied by pain in the head, back, thighs and calves of the legs, the pain predominating in one of these localities. Generally the head was most complained of. There was intense frontal or orbital pain, the face was flushed and congested, the cerebral vessels full and throbbing, with vivid injection of the eyes. The capillary engorgement of the conjunctivæ was often remarkable, the eyes presenting a bloodshot appearance. Sometimes, so sudden was the attack, that the patient would exclaim, "My brain is on fire," and go off at once into the wildest delirium. Many cases of this class terminated fatally in from six to twelve hours after the attack. In a few cases the face would be flushed, with a tendency to general capillary stagnation. Several moments would elapse after pressure before the color was restored, indicating a very sluggish circulation. The skin was generally hot

and dry, and great difficulty was found in many cases in exciting and maintaining uniform perspiration. In some the heat of the skin was very pungent, the bulb of the thermometer in the axilla indicating several degrees above the normal standard, in two cases rising to 106° and 107°. The pulse was generally much increased in frequency. In congestive cases, and proportionably in cases of tendency to congestion, it was full and strong, and with a degree of tension that forcibly resisted compression. In cases free from such tendency, it was compressible, and without much resistance or impulse. Its average frequency did not probably exceed one hundred pulsations per minute, though it was sometimes observed at 130, 140 and even 150. Patients generally complained of a bad taste in the mouth, the tongue being more or less furred, with red tip and edges, generally, though not always, moist, sometimes swollen, pale and tremulous. There was loss of appetite, constant and insatiable thirst, nausea, and often epigastric pain and tenderness; bowels generally constipated, urine small in quantity and highly colored, and always acid. In many cases the urine was tested and found to coagulate by heat and nitric acid, showing the presence of albumen. The disease was evidently a continued fever of a single paroxysm, in which remissions and exacerbations were seldom observed. A sympathetic, or secondary fever, in some cases occurred late in the disease, from internal inflammatory complications. The primary fever, or febrile stage, usually lasted from forty-eight to seventy-two or eighty hours; to give the extremes, from six or eight hours to five or seven days. If protracted beyond the seventh day, as it sometimes was, it presented many of the characteristic symptoms of typhoid fever. Comparatively few cases died with black vomit, the large majority dying by the brain, with delirium or stupor, the latter deepening into coma and insensibility. Black vomit, when it occurred, was not confined to the third or last stage. This was not necessarily a fatal symptom, and recoveries after this condition were more numerous than usual. A much larger number occurred in children than in adults, in consequence of the greater recuperative powers of the system at that period of life. Many cases were accompanied at their decline with a measly or scarlet rash, which would cover the surface of the chest and arms, sometimes of the trunk also. In some instances it assumed a vesicular, in others a petechial character. Boils and abscesses were not common sequelæ of this fever. As in all other epidemics, here and elsewhere, the mortality was greatest among the foreign population—the Irish and Germans—they being more numerous here than any other class of foreigners. It is not my purpose to enter into details of the various plans of treatment pursued by our physicians. The profession, with few exceptions, were unanimous against the use of quinine, as fraught with injurious consequences. Indeed, of its value in yellow fever, unmodified by malarious influence, we have not, I think, any satisfactory proof. In epidemics that present a mixed character, it may be, and doubtless has been, usefully employed. Certainly it was found inapplicable to the type of the disease which prevailed here during the past season. Its effect, after the use of evacuants, local bleeding and other appropriate treatment, was only, so far as my observation extended, to increase the cerebral irritation and to occasion great restlessness with exaltation of the febrile movement. Venesection was resorted to in a few instances, and with success where a highly sthenic grade of action and imminent symptoms of congestion existed in robust, vigorous subjects. This remedy might probably have been had recourse to oftener with advantage, owing to the peculiar congestive character of the epidemic, as has been previously described. For the same reason, mercury was more generally employed, and with greater benefit, than in previous

epidemics. The treatment adopted by most physicians, after the type and characteristics of the disease had been sufficiently studied, was, in general terms, about as follows: In cases that exhibited a tendency to congestion (it was, as before stated, very generally to the brain), as shown by the tension and resistance of the pulse, as well as by the local symptoms, it was usual to direct to be given two or three grains of calomel, at intervals of two or three hours, either alone or associated with bicarb. soda and extract hyoscyamus, until the bowels began to move. The calomel was given for its alterative and not its irritant effect. In these cases, when the tone of the arterial system was high, it was given to reduce the action of the heart and arteries, and also for its effect upon the whole secretory system, which seemed to be deeply and generally deranged. It was seldom, or never, given with the object of touching the gums, though they were sometimes unintentionally affected. After three, four, or more doses, according to the effect, motions were obtained from the bowels, usually at first dark and offensive, sometimes almost tarry in appearance, and then of a bilious character. After one or two of the last, if the bowels were disposed to overact, paregoric and soda, or some astringent, was given to restrain them. At the same time the local congestion was sought to be broken up, and equalization of the circulation effected by powerful revulsives—as, for example, if there were pain, heat, and throbbing of the head, by hot mustard foot-bath, strong mustard application at the back of the neck, from the mastoid processes half-way down the spine, and also a sinapism over the epigastrium. Cold and iced lotions were also freely and constantly applied to the forehead and temples. To secure the sedative influence of cold, it is indispensable that it be continuously applied. Did these measures fail to relieve the congestion and to moderate the fever, local depletion by cups or leeches was resorted to, and usually with excellent results. If the urinary secretion was deficient and scanty, a large sinapism over the lumbar region, down to the sacrum, was often found to relieve the congestion, on which it seemed to depend, and to better promote the action of the kidneys than the employment, however judicious, of diuretics. If nausea, with much epigastric tenderness existed, leeches were applied over the stomach for its relief. The assiduous application of strong mustard poultices over the stomach was preferable to blistering. A blister often presented a raw, irritable surface, indisposed to heal. If gastric irritability continued, it was best relieved by warm mustard poultices over the epigastrium, together with the internal administration of alkalies (bicarb. soda preferable), they alleviating the burning sensation at the stomach. Creasote and hydrocyanic acid were found of little or no advantage. Lime-water and sweet milk succeeded often in quieting gastric irritability, when more powerful remedies had failed. If, after a partial subsidence of the fever, the nervous symptoms were prominent and the patient restless and unable to sleep, some form of opiate was advantageously given to promote quiet and sleep. Often a few hours of tranquil sleep, at this stage, would be followed by resolution of the fever. Morphia and bicarb. soda in some aromatic water were often given with excellent effect to secure this object. Assafœtida was sometimes employed, with the happiest results, in subduing the nervous symptoms, nor were its disagreeable taste and odor found to disturb the stomach. It was usually, and I think best, given in combination with some preparation of opium. Most cases required stimulants after the febrile stage. Brandy and porter were generally esteemed the best. Relapses were frequent, and generally arose from imprudence and errors of diet, or from improper exertion at too early a period of convalescence. To enforce a rigid diet is often a difficult and disagreeable task for the physician, but many melancholy instances attest the

danger of neglect in this regard. The powers of assimilation are so greatly impaired after an attack of yellow fever, however mild, that the highest degree of caution and circumspection is necessary in the regulation of the diet. Farinaceous articles, and fluids, as light broths, carefully prepared, are best adapted to the enfeebled state of the digestive organs. Perhaps no article of diet is more suitable for a convalescent from yellow fever than fresh milk, easily assimilable as it is, and combining all the elements of nutrition. In many cases of the fever of a mild and uncomplicated character, the entire treatment consisted in a mild purgative, a foot-bath and diaphoretic drinks, cold or warm, according to preference of the patient, and followed by appropriate stimulants and tonics. Many physicians were led to the conclusion that medicines availed little in cutting short or even controlling the disease; that it was a fever which would run a certain definite course, in spite of remedies, and that the chief duty of the physician was to husband the resources of the constitution—averting, by proper measures, undue determination to any particular organ; or, according to Dr. La Roche's advice, to treat the urgent symptoms as they arise, leaving the rest to the reparative powers of the system. In cases where drastic purgatives were employed, it was generally observed that either the attacks proved fatal from profuse and uncontrollable diarrhœa, or if otherwise, that there resulted greater debility and more protracted convalesence. I will now conclude with the expression of the hope that the previous imperfect sketch may be the means of calling the attention of the physicians of Texas to the importance of giving to the profession a history of the recent memorable epidemic throughout our State, and that this, however small and unpretending a contribution to that object, may not be wholly without value. The epidemic of 1867, in Texas, swept to the realms of death not less, perhaps, than four thousand persons. Such calamities, like the shock of contending armies, and the overwhelming of cities by volcanoes and earthquakes, furnish the historian with events which fill the imagination and move the passions of mankind; but the scientific physician finds a deeper interest even in contemplating the causes and conditions which are concerned in producing "the pestilence which walketh in the darkness," and suddenly, with its poisonous breath, smites down whole communities,

> "Like plants, where the Simoon hath passed,
> At once, fall black and withering."

In view of this, the mere history of yellow fever, independently of its pathology and therapeutics, is a desideratum. There have been many theories and explanations of the cause of yellow fever. If the solution of this problem shall ever be achieved, a careful study of the history, geography and conditions of the disease affords the most promising route to that end; and should it fail to attain this result, its facts, divested of theory, must serve as the best landmarks and guides for the prevention, avoidance and mitigation of evils, the cause of which may forever elude human research.

From Indianola and Galveston, as initial or starting points, the one for the western and the other for the eastern part of the State, the disease, as will be apparent in the course of this report, prevailed over a wide extent of country, following the principal channels and routes of intercourse. I condense a brief statement of the epidemic at Port Lavaca, from an account furnished me by Dr. T. Somerville Burke, of that place. Port Lavaca, a town of twelve hundred inhabitants, is situated on Lavaca Bay, twelve miles distant from Indianola, and with which there is

frequent and constant intercourse. With the exception of occasional epidemics of yellow fever, Lavaca is remarkable for its salubrity. During the spring and summer of 1867 there was an unusual amount of rain. During the months of June and July the weather was very hot and oppressive, with a prevalence of light winds from the north, whereas the prevailing winds at that period of the year are from the south and southeast. The first case of yellow fever occurred on the 3d of July, and the disease progressively increased from that time till the first of August, when it was declared epidemic by the Board of Health. During the period from the 15th of August to the 1st of September the disease attained its height, and by the last of September it ceased to be epidemic. A few cases occurred during the month of October. Two distinct grades or phases of the disease were met with at different periods of its prevalence. In the beginning, symptoms tending to congestion of the brain predominated largely; toward the middle and decline of the epidemic, the symptoms showed a strong tendency to active congestion of the abdominal viscera. There were but few cases in which the kidneys were involved. One of the sequelæ of the fever was a measly or scarlet rash. Also large and numerous boils in some instances covered the entire body. The estimated number of cases was about five hundred, of which the mortality was twenty-nine. The character of the disease was generally mild.

From the accounts furnished me of the epidemic at Victoria, by Drs. S. Goodwin and J. B. P. January, I extract a synopsis. The year 1867 was remarkable for the great amount of rain which fell during the spring and summer at this point, and for the high range of temperature. Rains were of almost daily occurrence until near the subsidence of the epidemic. An unusual amount of malarial fever, chiefly of bilious remittent type, prevailed from the middle of June until the 1st of August. About the latter date several persons came to Victoria from Indianola, where yellow fever then prevailed, and were, on their arrival, attacked with the disease. These persons were clearly infected at Indianola. The disease spread and continued to increase till the 22d of August, when it was declared epidemic. From this time it pervaded the town, involving the whole unacclimated population, of every age and condition. From first to last the number of cases was probably not less than two thousand, of which the mortality was quite two hundred. The disease was of the congestive form, and the tendency in most of the fatal cases was to the brain. A number of cases were obviously modified to a greater or less extent by the coexistent malarial influence, of which mention has been before made. One case was reported by Dr. Sutherland, strictly intermittent in character, in which the patient died seven hours after the third chill, with profuse black vomit. These modified cases were more generally fatal than those of simple unmixed type, and were generally benefited by quinine in large or sedative doses. The disease attained its maximum of intensity about the 1st of October, from which time it gradually declined, a few cases occurring as late as Christmas. The only other point in Western Texas where this form of fever prevailed epidemically was Goliad. Of its history there I have only been able to learn that the first case occurred on the 12th of July, and that it was traceable beyond question to infection at Indianola. The same general climatic and hygienic conditions seem to have obtained there as have been described at Indianola and Lavaca. The estimated number of cases was one hundred and twenty-five, with twenty-three deaths resulting. As has been mentioned in the sketch of the epidemic at Galveston, the disease extended from that place to Houston, situated fifty miles north, on Buffalo Bayou, which flows into Galveston

Bay, and was thence diffused along the lines of the railroad which penetrates the interior, and even to points at a considerable distance from them. I regret my inability to obtain any history of its origin and prevalence at Houston, though I have made repeated applications for information, to several leading members of the profession of that place. I can therefore only say in general terms, from all the information accessible to me, that yellow fever seems to have prevailed there with equal severity and fatality as in Galveston, in ratio with the difference of population. There seems to have been exhibited a strong family likeness, as well between the atmospheric conditions as the type and other peculiarities of the disease at those points. The mortality did not probably fall short of six to seven hundred.

"Of the epidemic at Hempstead, distant fifty miles from Houston, on the Central Railroad, I can only learn that one hundred and fifty-one deaths was reported to the Howard Association of Galveston, as having occurred at Hempstead, from August 9th to November 26th, the entire period of the disease being embraced between those dates. Of the epidemic at Navasota, a town on the Central Railroad, eighty miles distant from Houston, and one hundred and thirty from Galveston, I present the subjoined brief account, extracts from a report made in response to my inquiries by Dr. A. R. Kilpatrick, a resident physician at that point.

"The town of Navasota is situated north latitude 30° 20′, longitude west of Washington 19° 20′, about two miles south of the Navasota and five miles east of the Brazos Rivers, in the midst of a moderately undulating country, of which the drainage is very imperfect. Many of the buildings, both dwellings and warehouses, are placed close to the ground, and allow the water from rains to collect under them, and often to stand for weeks. The soil is of alluvial formation and very tenacious of moisture. There was an unusual amount of rain during the spring and summer of 1867. In August, particularly, the rains were continuous and heavy. The range of temperature was extraordinarily high. In June, July, August and September, the thermometer was seldom below 80°, and often ranging from 90° to 98° or even 100°. During the latter part of July and early in August, there prevailed in the town an unusually severe grade of malarious fever, which exhibited some analogy to yellow fever. It was observed in two fatal cases that the cadaver turned very yellow. The first undoubted case of yellow fever occurred on the 12th of August, in the person of a citizen, on returning from a visit to Galveston. This case proved fatal on the 15th. Of those who visited his remains after death, several persons were attacked a few days afterward. Two of these cases terminated fatally with black vomit on the 24th. A panic now ensued, and of a population of three thousand, more than half precipitately fled the town. Some of these were already infected with the disease and died in the country or neighboring towns. Of the population that remained, not more than twelve or fifteen escaped an attack of the fever, and of this number, there was only three or four who had not had a previous attack. The total mortality from the epidemic was one hundred and fifty-four. Of the white population there occurred among males eighty-seven deaths, among females forty-three. Of the colored population, the mortality was twenty-four, and of this number there were only three of unmixed negro blood. The latter scarcely kept their beds in consequence of an attack of the disease. The epidemic was characterized by local determinations primarily to the abdominal viscera, and involving secondarily the brain and nervous system. Cases that were simple in form were easily treated, and recovered without difficulty. One second attack of the disease proved fatal. One recovery took place after black vomit. The lack of experienced and

efficient nurses, and even of medicines and other needful appliances for the sick, was very sensibly felt early in the epidemic, and certainly contributed greatly to the mortality. The disease may be said to have become epidemic about the last of August, and to have attained its greatest prevalence about the middle of September, after which date it gradually declined. It ceased early in December, well-marked cases occurring after frost. Cases of simple fever, after frost, would gradually merge into yellow fever. Contrary to the general rule, that epidemic diseases on their decline become milder and easier of control, the greatest mortality in proportion to number of cases occurred in November, which was no doubt ascribable to the cool variable weather, open and uncomfortable character of many of the dwellings, the want of fireplaces, etc."

The epidemic occurred at Millican, ten miles distant from Navasota, by railroad, simultaneously with that of the latter place. I have received no particular account of it. The mortality was about one hundred and fifty. I am indebted to Dr. William A. East, of Anderson, Grimes County, for a report of yellow fever at that place, from which I make the following synopsis:—The first case occurred on the 15th of October, in the person of an ostler attached to one of the hotels, who contracted the disease by visiting Navasota at night, where it existed at that time in an epidemic form. The proprietor of the hotel and his wife were next attacked, and died of black vomit. Their deaths excited a general panic, and nearly the whole population fled to the country. But few subjects were, in consequence, left for the disease, which would otherwise no doubt have prevailed widely and fatally. There occurred in all fifteen cases, of which four died. The last case occurred on the 12th of November. Of the epidemic at Huntsville, I have been unable to obtain any account from its resident physicians. I learn from the records of the Howard Association of Galveston, that from August 9th to October 19th, one hundred and thirty deaths were reported to them as occurring from the yellow fever at Huntsvillle. Huntsville is situated more than thirty miles from the Central Railroad at its nearest point. Yellow fever prevailed epidemically and with great severity at Chappell Hill and Brenham, towns situated on the Washington County branch of the Central Railroad. Dr. B. C. Meredith, of Chappell Hill, has furnished me an account of the epidemic there, from which I condense a brief statement. The early part of the spring and summer of 1867 was unusually rainy, producing a rank and rapid growth of vegetation, such as Dr. Meredith had never before observed, during a residence of twelve years. The rains continued frequent and heavy until the last of July. The exhalations from the surface after the rains added to the intensity of the heat, which was very great, the thermometer ranging from 85° to 103° Farenheit. These and other influences gave rise to malarial fevers at as early a period as May, which assumed principally the remittent form. As the season advanced they increased in virulence, and in many instances partook of the pernicious or congestive type. It was remarkable that almost every case of the bilious remittent form of fever was characterized by intense headache during its progress and by redness and injection of the conjunctivæ from the onset of the attack. The first case of yellow fever occurred two or three miles from the town. The subject, a young lady, contracted it from a trunk of dress goods received by her from Houston, the contents of which she occupied some time in opening and examining. This was on the 6th of August.

In further illustration of the communication of the disease by fomites may be mentioned the case of a young man in the town who contracted a well-marked attack from opening a box of damp books received from Houston or Galveston the

previous day. He spent several hours in their examination, and observed at the time the presence of a peculiar and unpleasant odor. Cases continued to increase till about the middle of September, when the disease may be said to have attained epidemic prevalence. A short time before a general flight of the panic-stricken inhabitants took place, and perhaps one-third of the population left the town. Of those remaining fully one-half fell victims to the destroyer. The total mortality was one hundred and twenty-three, of which ninety-three were white persons, young men preponderating in number, and thirty colored persons. The disease attained its zenith the last of September, and prevailed with great severity till late in October, when it declined gradually till its cessation, early in December. The disease generally evinced, in its commencement, a tendency to congestion of the brain and lungs. Cold water poured on the head from one-half hour to two hours seemed often to subdue the tendency to the brain, and almost invariably to produce composure, however great the cerebral excitement. Appropriate nourishment and stimulants were found necessary as soon as the fever subsided, a condition of great debility generally resulting. There was exhibited a very strong tendency to relapse on the slightest imprudence or over-exertion even after convalescence seemed fully established. There were two or three recoveries from black vomit. Among the victims of the epidemic were Drs. J. P. Perkins, E. W. Rodgers, E. P. Hammons and McCartney, a mortality of one-half the resident physicians.

Although the fever prevailed as a severe epidemic at Brenham, I have been unable to obtain any report from that place. From the records of the Howard Association at Galveston I learn that from August 11th to October 31st there were reported two hundred and forty-six cases, of which number the mortality was one hundred and twenty.

Dr. J. F. Hicks, of Columbus, has collected and reported to me some facts of interest of the epidemic at Alleyton, all the physicians of that place having died of yellow fever. The summer of 1867 was excessively wet, heavy rains falling from two to four times per week during the months of July, August and September. The first cases of yellow fever were reported by the resident physician on the 4th of September. These persons clearly contracted the fever in Galveston, being employés on the railroad and daily obliged to pass to and from Alleyton to Galveston. In a few days the disease became epidemic and nearly every inhabitant of the village suffered from it, except a few who fled to the country. The disease ran its course by the 20th of October. Dr. Hicks reports that not a single case of yellow fever occurred at Columbus, a considerable town on the Colorado river, distant only three miles from Alleyton, no intercourse being permitted with the latter place during the prevalence of the fever there. Late in November a refugee citizen returned to Alleyton, and some cases occurred under circumstances like the following: A family of three members moved into a house in which some bedding from the yellow fever hospital was stored. In a few days they were attacked with the yellow fever, and all died. Another family, returning on the 10th of December occupied the house in which Dr. Phillips had died, and in the cellar of which his clothing had been thrown after his death. All were attacked with yellow fever, and died on the 17th and 18th of the same month. Other families who returned at the same time to houses which had not been occupied by the sick during the epidemic escaped the disease. The total number of cases at Alleyton was about ninety; number of deaths, forty-five. Perhaps no town in the interior was visited with more severity than La Grange, distant from any line of railroad more than thirty miles. The following

brief abstract of the report of Dr. W. C. McGown, of La Grange, is herewith presented:—La Grange is situated in the beautiful valley of the Colorado, and contains about fifteen hundred inhabitants. Its site is sandy, with no stagnant water or marsh in or around the towm. The season was excessively wet, there being almost constant and heavy rains during the month of August and until the middle of September. The wind was chiefly north and northeast, the ordinary prevailing winds at that season being from the south. Miasmatic fevers prevailed to an unusual extent, of a mild character early in the summer, but later increasing in severity, and requiring larger doses of quinine and great caution in the employment of purgatives from heightened and extreme susceptibility to their effects. Yellow fever made its appearance about the last of August, spread rapidly, and soon became epidemic. The disease exhibited itself in every form, from the mildest to the most malignant. Its greatest prevalence and severity continued during the month of September, after which it became much milder and easier of control. The disease lasted until November, embracing a period of sixty days from its outbreak. About the 1st of November many of the inhabitants who had fled to avoid the fever returned, and very few cases occurred among them, in some large families a single case, in others none, and this, too, although the weather continued warm and there was no frost for several weeks afterward. The whole number of cases may be estimated at eight hundred, of which two hundred died. Perhaps not more than half of the cases had medical aid, as many of the resident physicians were attacked by the disease. Its origin is plainly ascribable to the fact that many persons came from Galveston and Houston to La Grange for security, some of whom had been in attendance on cases of yellow fever; others brought their bedding, etc. These persons were the first subjects of the disease.

Yellow fever extended to a few other points than those mentioned, as Bastrop and Independence, at each of which a few deaths occurred, and also Harrisburg, situated on the Galveston and Houston Railroad, and Liberty, situated on the Trinity River. At both Harrisbug and Liberty the disease prevailed with considerable severity, but I have no report or data from either place.

From the reports given at length and the abstracts of others, I trust I have succeeded in delineating the most prominent features, and grouping together the most important facts, of the yellow fever epidemic of 1867, in Texas; the most widespread and fatal known in the annals of her medical history. The uniformity and consistency which characterize the statements of the medical gentlemen who have contributed the fruits of their observations to the production of this report, afford the strongest guarantees of their competency and honesty as observers.

Before concluding this report, already extended to a length greater than was at first contemplated, I propose to review briefly some of the more important facts of the epidemic, and the deductions and inferences logically founded on them.

The remarkable uniformity in all the reports from all parts of the epidemic district, as respects the range of temperature, winds and rains, must have arrested the attention of the reader. The winds were, with few exceptions, from the north, northeast and northwest. The winds from these quarters during the summer months are not what are known as northers proper, which are, as a rule, associated with a low range of temperature, and blow with great force continuously for two or three days, and are very dry, having been wrung of their moisture in their course over the high range of mountains between Texas and the Pacific; but are mere puffs alternating with dead calms, the temperature being at the same time extraordinarly high, and

the atmosphere saturated with moisture. The same general influences clearly obtained throughout, at least, all the region of the State represented by the map herewith appended, and may be denominated the epidemic district, and such localities as escaped evidently owe their exemption to non-intercourse with infected places, and to guarding against the introduction of the disease either by person or fomites. So far as I have been able to learn, the origin of yellow fever was, during the past season, in every instance, clearly traceable to infection. In proof and illustration of these statements, the town of Columbus, only three miles distant from Alleyton, Washington, only five miles distant from Navasota, and Richmond, situated on the railroad from Galveston and Houston to Alleyton, escaped the disease by the enforcement of a rigid system of quarantine against all infected points, while I need scarcely recall to the reader the numerous instances to be found in the reports before given, where the evidence of the infectiousness of the disease was clear and indisputable. There seems to be but one opinion, so far as I have been able to extend my inquiries, as respects the putrid state of the atmosphere (if I may be allowed to use the term) of all the localities in Texas where yellow fever prevailed during the past year. The odor, which was broadcast in the atmosphere of the cities and towns where the epidemic raged, was offensive in the extreme. It would be difficult to institute a just comparison as respects its character. In former epidemics I have always experienced it, and can, perhaps, employ no better terms as expressive of it, than to style it a musty, sweetish, and withal, a peculiar pungent, deadly odor. According to my own observation and that of others, this peculiar odor, which to be appreciated must be experienced, only prevails in the midst of yellow fever. It is not confined to houses, but often pervades the atmosphere of certain districts of the infected locality. I have uniformly observed that where this odor is seemingly most concentrated, there a larger proportion of the susceptible are attacked and the disease is most malignant. Is this one of the sensible properties of the yellow fever poison; or does the poison determine certain chemical laws in an atmosphere reeking with almost every imaginable impurity consequent on active decomposition and exhalation of animal and vegetable matter, that result in the production of this odor? Is this the subtile and mysterious influence which, while it casts a death-like torpor over the vaso-nervous system, determines the most intense hyperæsthesia of the nerves of common sensation? Time and future observation must resolve the problem. I infer a relatively small amount of ozone to exist in such an atmosphere. Should yellow fever prevail this year, I hope to be able to either prove or disprove my conjectures.

EPIDEMIC YELLOW FEVER IN NAVASOTA, TEXAS, 1867.

The town of Navasota is in north latitude 30 deg. 20 min., longitude 19 deg. 20 min. west, about two miles south of the Navasota river, and about five miles east from the Brazos river; consequently strongly impressed by the effluvia and malaria from the swamps of the two streams. The surface of the country is nearly level, being only very slightly undulating, with many prairies and spots of woodland of oak growth. There are other streams on the south and east sides of Navasota, but they are small, and the swamps are not of such magnitude or extent as to materially influence the health of the country. The water used for drinking and culinary pur-

poses is that obtained from wells mostly, and is impregnated with lime, with traces of iron in a few. Some families use cistern water, but the cisterns are so small as to require the collection of all the rain which falls during the year, and that caught in summer is warm and goes through fermentation, and at times is unpleasant to the taste.

Navasota is situated partly in black prairie land, which receives the washings and debris from adjacent higher soil, and the municipal regulations have been so imperfectly enforced that little attention was paid to cleanliness in the streets, back yards and lots. Most of the stores and warehouses are built close to the ground, and the water runs under them, and in many places stands for weeks under the houses, creating gases, miasma, etc., too well understood to require any further description. In 1865 a large part of the town was burned down by accident, and in the winter of 1865–6, and, in fact, steadily on till the summer of 1867, the burned district was rebuilt, and many additional new buildings put up for the rapidly gathering population. The houses are mostly "*box houses*," put up hurriedly, with green timber, and the roofs often leaky and the flooring loose.

During the spring months, the sidewalks and streets were worked over, filled up with sand and dirt, and many ditches were opened in all the densely settled parts of the town; while every dwelling had a garden newly enclosed, plowed and spaded. The writer would call particular attention to these facts, as he is satisfied, from observations made in other epidemics in other towns long ago, that the working of the streets, hauling in dirt and plowing up ground *in town*, has a deleterious effect, and is promotive of disease.

The population was composed almost entirely of new comers—Southerners. it is true, and Texans, mostly, but still strangers *here*, and many of them from the northern and eastern counties.

There was an *unusual* amount of rain during the spring and summer. In August there were many days of rain, and some of the showers were very heavy.

The thermometer ran up higher than usual. In June, July, August and September the mercury was seldom below 80 degs., and in the heat of the day ranged from 90 to 98, and on one or two occasions even up to 100 degs. in the shade. My friend, Dr. Edward Merrill, of Waco, Texas, has furnished to the Texas Almanac, for 1868, a meteorological report for his locality, and the mercury went as high as 104 degs. in the shade, which, he says, "is higher than ever known before in that place." Every one complained of the excessive heat all the summer, but no one had time to notice the thermometer with any exactitude or regularity. It was the last of November before there was frost here.

The existence of Yellow Fever in Galveston early in the summer, and the easy intercourse by railroad from that place to Navasota, caused an early apprehension among the people that the disease would reach here, because they entertain a belief of transmissibility and contagion.

During the month of August, or even as early as July, there were cases of fever which resembled Yellow Fever, and Dr. Prior H. Smith remarked that if they had occurred in the midst of an epidemic he would class them as such. A youth, named ——— Stephens, came down from Anderson county late in July, and died of fever of a congestive type, about the 9th of August. He was treated by Dr. P. H. Smith. The cadaver turned very yellow, and the attending physician said the case bore strong resemblance to yellow fever. The house where he sickened and died was up on the sandy part of town. Julia Bass, aged seven years, was sick at the same time,

in a house close by, and died under the same physician, with the same symptoms, on the 11th of August.

Other similar cases occurred in the country, among persons who were in town almost daily. There were more cases in families in the country near town, in July and the early part of August, than there were *in town*. Can it be that there was a poison in the air in town which imparted disease to those who were thus in and out of town, while those who *dwelt* in town had become inured to the poison and were not so easily affected by it?

Captain B. Donnelly visited Galveston about the 5th of August, and returned to Navasota about the 12th. He was given to dissipation, and was intoxicated at the time, being "on a spree," as it is termed. He had *mania a potu*, and died suddenly on the 15th of August, and his body turned very yellow. It is not certain that there was any discharge of *black vomit*, either *per orem* or *anum*, but Dr. Smith was of the opinion he had yellow fever, and he was the attending physician. Capt. D. visited cases of yellow fever while in Galveston. He had many friends, and they called to see his dead body, and assisted in paying the last rites of friendship. He was a single man, and his body lay where it was easily accessible to the visits of friends or the idle curious. In a few days after his death there were three or more persons taken sick among those who had attended to the last sad offices, and on the 24th, two of them died with black vomit, and a little girl, child of C. F. Miller, who had the week before been brought in from the country, sickened and died early the same morning, with black vomit.

The explosion of a bomb-shell in the midst of a camp could not have caused more alarm and confusion than did these three fatal cases that day. About fifteen hundred people left precipitately in about forty-eight hours. Many of the refugees were already inoculated with the disease. Many were very sick, and a few died in the country, or other towns where they went.

The fever spread all over town. Those in distant and retired spots took it nearly as soon as those near the railroad depot.

In conjunction with, or addition to, the usual symptoms of yellow fever, this was characterized by congestion of the various organs of the abdomen, finally involving the brain and general nervous system. The cases of fever which were simple in their form were easily treated and cured. It is deemed unnecessary to enter into a detail of symptoms and treatment, as there is nothing new to write on the subject.

In some families, where there prevailed a certain temperament, or diathesis, or idiosyncrasy, there was increased fatality. This was quite observable in those who were of an irritable disposition and could not bear restraint, and those whose digestive organs were predisposed to take on inflammation or congestion.

As usual, the negro population fared better than the whites.

The remaining population, after all left who could get away, amounted to between eleven and twelve hundred, and every one of these, except about twelve or fifteen, took the fever. There were, I believe, some three or four who never had had the fever, who escaped it, and about ten or twelve who had had it before. Some few who had had it before took it and died; for instance, Dr. Prior H. Smith, whose name has been mentioned before.

There was one case which had black vomit and recovered, and is now well. There was another, a boy fourteen years old, who had the vomit and recovered, but the glands of his mouth sloughed out; he became dropsical and died in a prostrated condition, about the 4th of December.

MORTUARY TABLE.

Whites.		Blacks.	
Females	43	Males	20
Males	87	Females	4
Total	154		

making a mortality of a fraction over one death to every eight cases. In this table is embraced all of African descent, but the majority of them were mulattoes and griffes. Out of the twenty-four, there were only three who were *unmixed* negroes, and one of them was an old man who was in feeble health, from what his associates called "breast complaint;" probably asthma, with some hepatic disease; another was an old man; and the third was a young man or boy, about sixteen or seventeen, who was neglected, and after being sick about two weeks, was taken on horseback behind another negro, and carried off ten miles to some relations, and died in a half hour after getting there. I saw several cases of fever in real black negroes, who never laid down except at regular bed time.

If we had had experienced nurses early in the epidemic, the mortality would have been much less. The few persons here who had any experience in treating and nursing yellow fever could not attend near all the cases. It was no unusual thing to have from four to eight cases on hand in one house, and of course they were scattered in different rooms, were of different ages and sexes, and should have had suitable nurses. Often we could not get foot-baths, or mustard plasters, or poultices, or medicine for the cases. Often there was no one to keep fires, or cook or provide any of the most ordinary appliances for the sick. Negroes were untrustworthy, sleepy-headed, lazy, stupid, and even so thievish that there was no getting along with them. Some of these, when hired, and after agreeing to stay and wait on the sick, would slyly take provisions and clothing and run off in a few hours after making the contract.

About the 10th of September nurses began coming up from Houston and Galveston, but many of them were raw recruits, and no better than those we had already. Some nurses were sent by the charitable associations of those cities above named, who had some experience and were efficient help.

The epidemic may be said to have begun on or about the 24th of August. It increased and spread very rapidly from that time, and the greatest number of deaths were on the 7th, 8th, 9th and 10th of September, and eight on the 15th. After this last date, six were about the highest number which died in any twenty-four hours. The disease never ceased until after frost, which was about the 1st of December, owing to the fact of absentees returning to town after the subsidence of the epidemic. There were cases of well marked yellow fever even after frost. Cases of simple fever, after frost, would gradually merge into yellow fever.

It is generally the rule with epidemics that upon their decrease the cases are milder and more manageable, but in this case the reverse was the rule. In November nearly every case died. Although the physicians and nurses had acquired skill in the management of the fever, yet it seemed not to avail them. It was, in some measure, owing to the cool weather, long nights, uncomfortable houses, lack of fireplaces, etc.

No other epidemic disease appeared here during the year 1867.

A. R. KILPATRICK, M. D.

THE NATURE AND TREATMENT OF YELLOW FEVER.

Yellow fever is insidious in its attack. In many cases it is so masked, especially in the commencement of an epidemic, as to render the diagnosis difficult. In its mildest form it is by no means an easy task to distinguish the earliest cases. It is necessary to witness the symptoms which attend the fatal termination, nor is it always easy to settle the question satisfactorily with the first few deaths; sometimes it requires a number of cases before it assumes an unquestionable character.

During the prevalence of an epidemic, every person, whether acclimated or not, is sure to experience to some extent the dull headache and general neuralgic symptoms.

The attack is usually at night, commencing with a slight rigor, and often with a chill almost amounting to congestion. Persons having experienced an ordinary chill, recognize at once the peculiarity of the chill ushering in an attack of yellow fever, by the cold and creeping sensation along the spine, radiating from the nerve-centres toward the extremities. Some are attacked suddenly, without premonition; the person may be walking the street or pursuing his avocation, and fall in a stupor. Such cases are denominated walking cases, and they usually die from congestion and coma.

There are three distinct stages in yellow fever: The first stage is that of primary febrile action. The second, that of repose or subsidence of fever. The third, that of secondary fever. After the chill, febrile action commences, and lasts usually three days, though sometimes as long as six. An unusual duration is always considered unfavorable. During the remission, the patient considers himself quite well, except debilitated, and if allowed would sit up.

During the apyrexia, the great prostration is remarkable, and not in proportion to the preceding fever; with this exception, the inexperienced observer can see nothing which does not indicate speedy convalescence. This is a deceptive period, and the morrow may develop black vomit, and perhaps death. This period lasts from twelve to twenty-four hours. In mild cases convalescence dates from this time. The secondary fever may run an indefinite period.

The assemblage of characteristic symptoms is well marked, generally, in all stages; but the history, the exposure, etc., must have their due consideration. The peculiarity of the invasive chill, the vascular excitement, the brilliant and injected eye, or, as it has sometimes been termed, the besotted expression, with severe neuralgia, the duration of the primary fever, etc., must have their weight.

The conjunctiva assumes a reddish appearance from the commencement of the fever, then is followed by a dull-yellow and leaden hue.

About the third stage the color of the skin commences to change, beginning at the white of the eye, and extending over the forehead, chest, abdomen and extremities, presenting a dusky orange color, more marked upon the chest and abdomen than elsewhere, and as the disease progresses approaches a mahogany hue.

The urine is highly colored, and stains linen as if deeply impregnated with bile. The pulse usually ranges from 100° to 120°, and in inflammatory cases runs as high as 140° per minute. There is usually great diversity in its volume; it may be weak and small or full and bounding, but is usually very compressible.

The color of the skin is not always yellow even after death, though in many cases it is well marked, presenting the various tints of a fully-ripe pumpkin to that of a purplish-mottled mahogany cast. The coloring-matter is derived from the blood, and is extravasated hematosin. The color is more intensified after death.

In some instances the perspiration stains any white substance with which it comes in contact. The tongue is usually moist and covered with a white, pasty fur, sometimes assuming the color of blue clay, the middle portion changing to brown in the latter stage, and in many cases it is red and smooth.

There is much difference in the manner of attack in this disease. The most favorable cases are those that have marked symptoms, ushered in at once with a chill, reaction, and fever. Its ravages are very destructive to the blood, and the chances for recovery are not so good in those cases that come on more slowly, which enable the patient to keep up and about his business.

A very serious source of fatality is the peculiar mental condition of most patients. Having experienced the aching sensation incident to the locality of its prevalence, they constantly imagine they are taking the fever; but when really attacked they cannot realize it, and fail to go to bed in time, and endeavor by exercise and an extra amount of clothing to sweat it off, while rest and absolute quiet are necessary for recovery.

It requires great watchfulness and discrimination in its management. If cases are detected soon and kept absolutely quiet, the chances for recovery are much enhanced, the enervating process of blood poisoning not being carried to the same extent. For this reason, strangers, in trying to become acclimated, are so liable to sacrifice their lives; they are not willing to be covered, and endeavor to brave an attack.

If the case proves fatal during the secondary fever, death takes place most frequently upon the fourth, fifth, or sixth day, though in some rare cases as early as the third, and is sometimes deferred until the ninth day. Such cases usually assume a typhoid type, and recovery may be deferred weeks. Convalescence must necessarily be slow, considering the great repair necessary for the blood to undergo. The bowels are ordinarily constipated, and movements when obtained are very offensive.

The neuralgic symptoms are often very intense, particularly of the head, back, and limbs, frequently exciting screams, and usually lasting through the febrile stage. The patient complains of a burning sensation in the stomach, with nausea, with or without vomiting. The sense of weight and uneasiness about the epigastrium is almost universal, with tenderness upon pressure. There is a great desire for cold drinks, but any considerable amount of fluid taken only increases the irritability of the stomach.

Black vomit may not be present in every case, though after death, if the stomach is inspected, it is usually found to contain it. The manner of ejection is peculiar: the patient first hiccoughs, which is followed by a spurt of vomit, without effort. The patient often notices it, but seldom remarks upon its fatal tendency.

The matter first vomited is such as had been swallowed; afterward, mucus streaked with brownish matter; until, finally, we have the true black vomit. It usually has an acid reaction. When ejected upon linen it has a glistening appearance, imparting a stain very difficult to remove, though, when vomited in a vessel, it separates into two distinct parts, one resembling coffee-grounds, and settling, with a viscid mucus rising to the surface. The dark, flaky portion is doubtless an altered condition of the blood produced by congestion of the stomach.

One of the most difficult problems in the whole range of medical science is to determine the generative cause in a given disease. Reflecting physicians, having witnessed an epidemic, are apt to form their own theory of its cause, yet but few agree. It is known to be a disease of warm climates, and that it cannot exist in low temper-

atures, although the exact laws that govern it we do not understand, nor the exact temperature necessary for its production. Each epidemic has its own peculiar phases, and, when one opinion appears to be well grounded, another epidemic occurs, overthrowing it in many important particulars. The cause is entirely distinct, and does not produce any other known disease. Dengue more closely resembles it in its character than any other disease, and still they are quite dissimilar, although the premonitory symptoms sufficiently resemble to lead the physician astray in the commencement of an epidemic. Dengue does not destroy life, unless complicated with some organic affection.

Its occurrence is usually considered a receipt in full for yellow fever during that season. It is possible, though rarely the case, that both dengue and yellow fever prevail in the same locality during the same season.

Yellow fever is evidently a disease of populous cities, and usually attacks persons congregated together. Miasm, filth, foul air, or any cause sufficient to produce a low grade of fever, will not produce it, though such causes may act in a general way by enfeebling the vital forces and powers of the system, rendering it more liable to its influence.

Yellow fever is a disease of local origin. It is an impression that it may be generated in an inland locality, provided a combination of circumstances exists necessary for its production. The writer has seen a number of cases occurring upon a plantation remote from public thoroughfares and water-courses, resembling in every particular the peculiar phase of an established epidemic, with black vomit occurring without premonition, spurting from the mouth without effort, together with the hemorrhagic condition often manifested in this complaint.

This condition existed prior to the prevalence of an epidemic in Galveston, Texas, in 1864, upon a plantation in Austin county, which was situated four miles from the Central Railroad, and one hundred miles from the coast of Galveston. A negro died with black vomit, and a similar matter oozed from the mucous surface, staining profusely the linen. It did not prevail epidemically in this immediate vicinity, but did in Galveston and Houston during the same season, in a malignant form, causing the death of many of the citizens and Confederate troops.

According to my observations, epidemics prevail more malignantly in country places than in cities, and are more destructive to life. This may in part be attributed to inexperienced nurses, and to the buildings usually being more open, and not so well calculated to protect the sick from every sudden change of the atmosphere.

It is considered that persons once acclimated by having had yellow fever are not liable again, but well-established cases do occur in persons having lost their acclimation by a change of residence. Generally, I believe this is not the case. I must here state that I have never witnessed a second attack in the same person, though the testimony of experienced observers is decidedly in favor of its recurrence.

Prior to 1853, it was considered impossible for this disease to exist and prevail epidemically outside of the populous towns and cities ; but since that time it has done so, first following water-courses, and afterward penetrating the interior towns remote from the coast or any considerable thoroughfare, confining itself to small towns and plantations: 1867 affords innumerable instances of this kind.

The general opinion is, that it is not contagious, and cannot be taken by contact. Having myself passed through several malignant epidemics, acting the part of physician and nurse, and assisting in burying the dead, I never have contracted the fever. This opinion is expressed by Blair and Dr. Warren Stone. Both gentlemen

having been long residents of climates where yellow fever prevails epidemically, their opportunities for observation have been great, and consequently their opinions are entitled to respect.

A peculiar atmosphere seems to favor the prevalence of yellow fever: it is a murky atmosphere, alternated with hot sunshine, and frequent showers, enough to keep the face of the country saturated. Books grow mouldy upon the shelves, and the boots you have worn during the day become mouldy during the night. The emanations from the earth in the hot sunshine during such seasons are sickening in the extreme.

Negroes are not so liable to yellow fever as white people, and their susceptibility seems to be in direct ratio to the proportion of Caucasian blood they possess.

Negroes imported direct from Africa, and introduced immediately into a yellow-fevor atmosphere, seldom contract the disease, while they are very susceptible to the other diseases of the locality. This fever is very fatal to young children. I recall an instance where a mother and infant eleven days old both took yellow fever; the infant died with black vomit, and the mother recovered upon the fourth day. Non-residents are more susceptible to its influence than residents otherwise acclimated. Those accustomed to excesses are marked victims, such as the intemperate and licentious. The plethoric, with apoplectic habit, seldom recover; the same holds true with the sanguine temperament.

The ordinary mortality should not exceed ten or twelve per cent., all things being favorable; but, if there is a large influx of strangers the mortality will be much greater. The class of persons attacked also makes much difference. Dr. Fenner (*New Orleans Medical and Surgical Journal*, July, 1848) mentions the fact that the poorer and laboring classes were most subject to the fever, and says:—

"People in easy circumstances, who are not exposed or imprudent, suffer but little from yellow fever in the great Southern emporium, and the mortality is comparatively small."

The matter of nausea is of great importance. Often, by a nice prescription, the physician can anticipate, and by suitable remedies prevent, what would inevitably follow.

Black vomit does not necessarily imply death. Persons do sometimes recover after it. According to my observation, about two per cent. recover.

The black vomit of the congestive form of bilious remittents has its characteristics, and should not be mistaken for true black vomit of yellow fever. The first is in reality altered bile, and imparts a bilious hue to water, while the black vomit of yellow fever is altered blood, and does not stain or color water, but remains distinct and separate. There is a similar difference upon its being vomited upon linen, the one staining a white surface a bilious tinge, and the other staining a glistening bronze.

In bilious remittent fever the spleen is always enlarged and congested, but this is not the case in yellow fever: there are congestion and inflammation in the stomach when black vomit occurs in either case.

Violent mania is exhibited in a small proportion of cases, with persistent screaming and struggling to relieve themselves from the restraint of the attendants to the last breath, when death relieves them, as if by an electric shock. The relation of a circumstance will explain: In visiting a German woman upon the fourth day of her attack, her symptoms having been previously very favorable, I was surprised to find her husband upon the bed, astride of her, holding the bedclothes down tightly around her neck, and she screaming and biting at him, alternately cursing and im-

ploring him to loosen his grasp, when in an instant she ceased to speak and struggle, and was really dead.

The individuality of this disease is unmistakably strong. The phenomena of each epidemic may vary, but all possess the specific features and essential characteristics of the malady. No matter what organ suffers, the stomach must bear the main burden. It is acknowledged to be a specific disease, and unlike, in its main features, any other. Its mode of attack and its duration are substantially the same. During its whole course only one symptom may be considered pathognomonic exclusively, and that is true black vomit.

The peculiarity of the invasive chill already referred to, the history, and the exposure, must have their due consideration.

When the patient has an irrepressible hunger, and will eat greedily anything within his reach, speaks intelligently, but really is not sane, it should be regarded as a threatening symptom, particularly if occurring before convalescence in the third stage.

The colliquative perspiration, during the apyrexia, when associated with cadaveric odor, with shriveled features, lividity of the skin, thready pulse, and extreme sensibility of the epigastrium, is also alarming.

Persons addicted to dissipation are almost sure to die; and such persons, when exposed to an epidemic, are apt to indulge freely, partly from habit, and partly from fear, thinking that, if they keep stimulated to a certain point, they will escape; but this is fallacy, observation having proved the contrary. They are more liable to be attacked, and, when taken, the disease proves more fatal.

The urine of yellow-fever patients has been most attentively examined, with the hope that it would furnish means of diagnosis and prognosis.

The experiments of Bartlett, in three hundred cases, satisfied him that, during the first stage, the physical characteristics of the urine are the same as in other fevers. But, in the second stage, the urine, as the disease becomes developed, assumes more or less of a deep-brown color and viscid consistence. Subjected to nitric acid or heat, an albuminous precipitate is obtained, the abundance of the albumen varying according to the progress of the disease. If the termination is to be fatal, it increases until death; if favorable, the amount of albumen gradually decreases. It disappears before the yellowness of the eyes and skin is gone, which usually takes place between the eleventh and twentieth days.

There is no symptom so fatal as the suppression of urine, not excepting black vomit. It is occasioned by the closing of the uriniferous tubes by accumulated epithelium-casts of the urinary tubuli, or portions of the mucous membrane, which produces mechanical lesions of the secreting structure of the kidneys. The approaching signs of congestion should, therefore, be watched carefully, to guard against this fatal symptom.

In females, the catamenia are sure to appear, whether due or not.

Any disease occurring during the prevalence of an epidemic is liable to assume the characteristic type. An illustrative case came under my observation in 1859. A jeweler, living in an inland town, fearing to expose his family to the epidemic influence, more than two miles distant in the country, remained in town during the day to conduct his business, and after closing his store walked to his country residence. Not being accustomed to the unusual fatigue, perspiration was freely excited, and, by taking cold, he contracted pneumonia, which yielded in nine days, only to give place to yellow fever of an aggravated form, presenting the mania so

frequently the accompaniment of this disease—afterward passing into a typhoid condition, with the secondary symptoms of suppuration of the parotid glands. Here were three distinct diseases following each other in rapid succession, the patient finally recovering after the lapse of weeks.

There is an impression that a severe frost effectually checks the progress of an epidemic. This is not always the case, and will not stay permanently the ravages of yellow fever.

In 1859, in Texas, frost was deferred until the early part of December. During this season a malignant epidemic was prevailing, and many were anxiously looking for frost as a relief to the exposed and suffering. At length it came, and with it ice formed in a single night more than an inch thick in shallow water.

The joy was unbounded among the inhabitants surrounding the infected district, but, to their disappointment, in the course of ten days the epidemic doubled its malignancy, and spread with much greater rapidity. Those cases that were just convalescing at the time of this sudden change in the atmosphere, nearly all proved fatal, especially those that were unfortunately sick in open tenements. This is usually the case in the decline of epidemics; with warm days and frosty nights the mortality is very great. Dr. Bennett Dowler (*New Orleans Medical and Surgical Journal*, January, 1848) remarks that "there is by no means the connection between frost and the subsidence of yellow fever that has generally been supposed to exist. The epidemic of 1847 appeared in New Orleans early in July, and disappeared by the middle of October, and yet frost was delayed until several weeks afterward. Summer heat may continue far into autumn, the city be crowded with unacclimated persons, and still the health continue to improve. Strangers hasten into houses, all the inmates of which had perished but a few weeks before, and escape the infection."

Treatment.—The conservative mode of treatment is the most rational and successful, according to my experience; I mean by this, the employment of remedies calculated to mitigate symptoms and guide the malady to a favorable termination. Early attention to first symptoms is of great value in lessening mortality.

It is often remarked by individuals accustomed to see yellow fever, that they would rather risk their chances for recovery with the attendance of an experienced nurse, than with the treatment of an inexperienced physician, and in explanation say that the nurse would rely only upon the powers of Nature to eliminate the effect of the poison, while the physician, anxious to do something, and not knowing exactly what to do, would do harm. This may be true, but there is much to be done for a yellow fever patient, and the careful and discriminating physician is the one best calculated to pilot the vessel through this fearful storm to a safe termination of its decisive voyage in the harbor of health.

Upon seeing a case in the beginning, immediately after the invasive chill, if it was suspected that the stomach was charged with ingesta, an emetic of mustard and water was preceded by the administration of a laxative. If perspiration was not readily established, a mustard foot-bath given in bed was of service. Immediately after this, a full dose of quinine should be given. Its effects are remarkable. It generally quiets the neuralgia completely, and promotes perspiration.

When diaphoresis is once established, it is not difficult to maintain it by absolute quiet, and the case ordinarily does well.

Only give purgatives in the commencement of an attack. I have frequently seen

patients go with impunity six days without an evacuation. It is important to rid the stomach and bowels of all irritating matter, and to get the skin to act freely.

After this, the less you interfere the better. Keep the patient covered and quiet, and perspiring, but not to excess. Enough covering is required to answer this purpose, but not enough to burden the sufferer. Nothing more is necessary but warm teas to allay thirst. Orange-leaf tea is very proper, or weak sage tea, but if these are repulsive they should not be used.

If cool drinks are demanded, give them in moderation; the stomach is its own monitor. Yellow fever stomachs are peculiar; they will retain anything they like, or reject anything unpleasant. It must be remembered that the first fever will terminate generally better without medicine than with it.

Some are in the habit of using stimulants throughout the disease; my personal experience is decidedly in favor of spirituous liquor in the exacerbation of fever, if the patient craves it, and there is much tendency to sinking. I do not wish to be understood as advocating stimulus, except during the stage of convalescence.

There are cases when the external soreness is excruciating; such patients must not be handled nor bruised, but kept in a horizontal position. The wastes from the body should be accomplished through urinal and bed-pan.

During the stage of repair the patient should be nourished—if not, he will sink—and by nourishment the deterioration of the blood seems in a great measure to be prevented.

The diet should be selected with reference to its ease of digestion and assimilation. Patients cannot get up, after even a slight attack, with safety, without being abundantly nourished.

There are cases which demand the use of quinine throughout their whole course; such are denominated congestive cases. Those occurring during the decline of an epidemic, when the weather is becoming variable, with warm days and cool nights (this very changeable atmosphere is very trying to yellow fever patients), if not sufficiently protected and supported by appropriate care, are apt to succumb and perish.

One of the most alarming symptoms in yellow fever is irritability of the stomach. It is so apt to be present, and so often uncontrollable, that it is of importance to find a remedy to check it.

When muriatic acid is about being formed in the stomach, there is a burning sensation, which is generally relieved by the use of alkalies; chlorate of potash, or the super-carbonate of soda, and sulphate of morphia, have generally succeeded. For the excessive nausea, an emulsion of creasote acts quite promptly.

The suppression of urine is an exceedingly fatal symptom. Very few persons recover after this takes place; remedies seem to be of little avail.

The internal use of soda and potash has sometimes been beneficial; also friction over the lumbar region, with stimulating liniments.

Any acute disease occurring in a southern latitude, if not controlled in nine or ten days, is apt to assume a typhoid type. The treatment of these symptoms should be expectant, and the same as in typhoid fever. The supporting plan is always necessary, guarding scrupulously against enteric symptoms.

The occurrence of one of the secondary symptoms of a typhoid condition is often present. Of this I desire particularly to speak—that is the treatment of the inflammation of the salivary glands. It frequently springs up very suddenly, augmenting the already troublesome symptoms, and, if allowed to go on to suppuration, may

continue to annoy the patient for months by a profuse fetid discharge, and protract much the period of recovery. Having tried ineffectually the ordinary modes of dispersing it, such as the application of iodine, turpentine-frictions, blisters, etc., I resorted, with entire success, to the use of the lancet in the following manner: As soon as the patient complained of stiffness of the articulation of the jaws, and tumefaction was observed, I immediately thrust the point of a thumb lancet to the bone, at the angle of the jaw. Sometimes a teaspoonful of blood would follow, and frequently only a few drops; if it bled too much, it was easily checked by styptic applications.

This was usually quite sufficient; but, if not, I repeated this procedure the second, or, if necessary, the third time upon each daily visit, when this troublesome symptom would disappear. I have never known suppuration to follow when treated in this manner.

Mustard plasters applied to the spine, when the neuralgia is excessive, often afford relief, and may be applied frequently.

It is of the greatest importance to nourish your sick after the subsidence of the fever; it does not require much, but, if they are not nourished, they will sink. If the patient will not take nourishment, it will be absorbed by the rectum, and must be then administered in this way.

The effect of quinine as a prophylactic is well established in yellow fever; but, if continued too long, the system will become accustomed to its use, and its effect will be similar to any species of dissipation, and not accomplish the desired effect. It is uncertain whether the system can be constantly kept under the influence of this drug, to insure exemption from the epidemic during seasons of its protracted prevalence. Many persons use quinine for this purpose and escape, while others escape without having taken any prophylactic. I now recall several cases during the epidemic of 1859, of persons who used quinine for this purpose, but succumbed and perished toward the close of the epidemic. There is no doubt that quinine is the best prophylactic within our knowledge against yellow fever, but it is a much more certain protective against miasm.

JAMES S. BAILEY, M. D.

YELLOW FEVER IN MARSHALL, TEXAS, IN 1873.

Marshall is in latitude 32° 29′. It is two hundred and forty-seven feet above Shreveport, La., and four hundred and fifty-one feet above tidewater. The city is built on the dividing ridge between the waters of the Red and Sabine rivers. The soil is sandy, with clay foundation. Iron pyrites and conglomerate iron abound. The timber is pine on the west and south, and oak, blackjack and hickory on the east and north sides. The water used is nearly all from wells averaging thirty feet in depth, and generally contains some combination of iron. The public square (which we take as one of the landmarks to guide us in this description) is the centre and highest point of that part that now interests us. From this point the surface is almost level toward the north and northwest; but ravines radiate toward the west, south and east, and broaden and deepen, until they merge into a valley some two hundred yards wide, between a quarter and half mile distant from the square. The small stream that runs through this valley overflows with every hard

rain. The several marshes hold water until our summer drouths evaporate them. The natural drainage of the city is good, but throwing brush into the ditches, to prevent too much washing, I believe, acts as a filter, to retain, during the summer, noxious material. We have no Board of Health nor city physician.

Marshall is not compactly built, and has been described as "appearing rather like a collection of country residences than a city." The population in September, 1872, was about four thousand, nearly half being negroes. Up to this date there had never been an epidemic of yellow fever, and no special precautions had ever been used to prevent it. In 1857 more than one case of yellow fever was brought here from Shreveport, some of which died; the disease did not spread. In short, this city has been reputed to be one of the healthiest localities in eastern Texas. We have had intermittent and remittent fevers in their season, but they were almost confined to the southern and eastern portions of the city.

Now let us see what, if any, were the differences in the conditions of the locality before and during 1873. Twelve months, ending September, 1873, added to the population of Marshall about two thousand inhabitants, nearly all immigrants from the Northern states. Besides, the transient population would number several hundred, chiefly railroad laborers. Nearly all these new-comers took up their abode in the same part of the city, to wit, between the public square and the Texas and Pacific railroad depot (a half mile northeast from the square), and around the latter locality. Thus was created a demand for numerous boarding houses, restaurants and dormitories, all in the same neighborhood, and many of them of the very lowest class, cleanliness secondary to even the proprietors' godliness.

During the autumn of 1872 and the following winter, large excavations were made near the depot, requiring the removal of many thousand cubic yards of dirt; but there was freezing weather after all this was finished. On the first block, northeast of the square, was a repository for beef hides. The offensiveness of this particular locality was, at times, almost unbearable, during the summer season. This evil was remedied shortly before the advent of the fever. Near this spot was also the city market, which, to all appearances, was nicely kept. The changes noticed above did not take place to any extent in any other part of the city.

At the outbreak of the yellow fever in Shreveport, hundreds of the citizens of that place came pouring into Marshall and the country around.* Of those who sought refuge in Marshall, a large majority found accommodations in that quarter of the city north and northeast of the public square. Many of the refugees were sick soon after their arrival, all cases presenting, more or less, the appearance of yellow fever. I select the following cases, as more plainly marked than the average:—

Miss G.; came from Shreveport on the 2d of September; taken sick on the 3d; violent pain in the frontal region and in the back and limbs; considerable nervous excitement; face flushed, expression anxious, eyes injected; tongue and fauces very red; pulse 110; bowels constipated; urine normal in quantity, of deep amber color; no deposits. Gave mercurial purge, and followed with large doses of quinine, combined with a small quantity of morphine. Gradual subsidence of fever—patient discharged convalescent on the fourth day. The locality was two hundred yards northwest of the public square. She soon after moved to a house the same distance northeast of the square.

In this last house Mr. L., of Shreveport, was taken sick on the 5th of September,

* Marshall did not declare quarantine against Shreveport until September 28th, and then found its establishment impracticable.

with a chill. He took a hot mustard bath, and wrapped in blankets; perspired very profusely. He had no symptoms distinctive of yellow fever. Was ordered a scruple of quinine, to be taken within twenty-four hours, and recovered.

Mr. D., on the 7th of September, rode horseback into Marshall, from six miles in the country, where he had been stopping since leaving Shreveport, about the last of August. He had what he thought was a chill, and came in town to consult a physician. He took quarters two hundred yards south of the square. On the night of the 7th he had very high fever; a wild, staring expression; face congested, eyes red and suffused; skin very hot and dry; pulse full, strong, and 140 to the minute; oppressed breathing; pain severe in the head and in the lumbar region, and in the epigastrium, on pressure, slight nausea; tongue white in the centre, with red edges and tip; fauces and gums very red; bowels constipated; urine passed freely, and of a saffron color. Gave six ounce sol. magnesia citrat., to be repeated in two hours if his bowels were not moved. Also, five grains quinine every two hours to cinchonism. Ice freely.

Second day.—Bowels acted after second dose of magnesia; required two scruples of quinine to effect cinchonism; skin very hot but moist; pulse 128; other symptoms much the same as yesterday, except that conjunctivæ have a dark yellow tinge; continue ice; apply mustard to epigastrium and lumbar region.

Third day.—Surface distinctly yellow; pulse 110; patient inclines to sleep, is easily roused, and answers rationally; kidneys secrete normal quantity of urine; no chemical examination made; nausea increased; stomach emits a glairy mucus; mustard temporarily relieved pain. Gave flaxseed tea and sweet spts. nitre; chicken soup as nourishment.

Fourth day.—Yellowness more distinct and increased; growing rapidly weaker; more nausea; add brandy to treatment of yesterday.

Fifth day.—Increase in gravity of all the symptoms; delirium alternates with somnolence; urine becoming scant; pulse weaker, 140 to the minute; takes beef tea and brandy without vomiting. Death at the close of this day; no urine passed for eight hours. Mr. D. brought no baggage to this house with him. None of those who came in contact with him had the disease, nor was there any spread of it in this part of the city.

Case II.—Mr. C. W., aged 25; express messenger on railroad running to and from Shreveport; made several trips to that place after the fever had broken out; has no knowledge of exposure to any particular case, or on any particular date. On the 8th of September, while near Dallas, Texas, he had a chill, without premonitory symptoms; was seen by Dr. Marks on the second day of illness; had hot dry skin; tongue clean and moist, with red tip; nausea and vomiting; anxious look; eyes suffused, yellow and injected; urine of normal quantity and high color; bowels constipated; pain in the head and back, and, I think, he complained of "tired feeling in his limbs." On the 6th or 7th day he vomited a small quantity of black flaky substance in a brown-colored fluid; convalescent on the 8th or 9th; pulse became quite weak; skin cool and moist. Gave stimulant and nutritious diet. On the — day there was a rise of fever, which ran a course somewhat similar to typhoid fever. During this stage, delirium, of the peculiar character seen in delirium tremens, came on. He complained of pain in the umbilical region; had no tympanites. Convalescence from this fever began on the 17th day, and was more rapid than is usual after typhoid fever. No one at this house (two hundred yards east of the square) contracted the fever, and there is no evidence of its spread from this case.

Case III.—W. S., aged 28 years, native of Arkansas or Missouri; has lived in

Marshall about one year; tall, muscular, of bilious temperament; general health good. Had charge of a large billiard hall in the upper story of a brick building, on the eastern border of the public square.

This and case IV being the first citizens attacked, a committee of three (Drs. E. P. M. Johnson, Eads and Marks) was appointed by the medical society, to investigate these cases, and, if possible, ascertain the origin. The committee found no evidence to show that case III was ever exposed to any other case of yellow fever. The evidence bearing on case IV will be given in proper order. Mr. S. stayed a day and a night in the billiard hall and adjoining room. On September 19th he had a severe chill, followed by very high fever, with intense pain in the head, back and limbs. Dr. Eads saw him in a few hours, and described him as having an anxious expression; eyes red and suffused; pain in epigastrium on pressure; skin dry and hot; pulse 140; obstinate constipation; scant quantity of urine. Gave mercurial cathartic, followed by quinine.

Second day.—No abatement of any of the symptoms; pain as intense, constipation as obstinate; skin very hot, slightly moist; surface has a dusky hue; eyes of dark yellow; tongue heavily coated with brownish fur; gums red and swollen. Gave sol. magnesia citrat. f.℥j to move bowels; ice to be used freely; also five-grain doses of quinine every two hours.

Third day.—Moved bowels by enema; urine in small quantity and of high color; highly albuminous; pulse getting weaker; takes very little nourishment, on account of nausea and vomiting.

Fourth day.—Symptoms all aggravated; urine completely suppressed; active delirium and black vomit set in.

Fifth day.—Furious delirium; black vomit continues at intervals. In his wildest moments three strong men cannot hold him in bed. Died to-day. When shrouding him, his friends noticed several dark blue spots on the sides of his neck and shoulders.

Case IV.—H. R., German, 25 or 30 years old; has lived in this town and county several years, and enjoyed good health; very dissipated; kept a grocery store and bar-room in the lower story of the building containing the billiard hall. There is abundant evidence that this man had made several attempts to get a conveyance to take him to Shreveport to smuggle goods through the quarantine. And Dr. Johnson tells me he has evidence entirely satisfactory to him, that Mr. R. did visit Shreveport, and bring from there to Marshall a lewd woman, whom he visited several times afterward. It is presumed (but of this there is no positive proof) that R. did not visit Shreveport for this alone, but also brought goods, such as lemons, etc., and it is further inferred (though there is no proof of this either) that case III bought lemons (for he had a bar attached to his billiard hall) from Mr. R. The date of this alleged exposure of case IV was from four to ten days prior to his attack. He was taken with a chill on September 23d, followed by fever. It lasted forty-eight hours, and left him with a cool moist surface; mind apparently clear; pulse 70 and feeling well again, as he expressed himself. No chemical examination of urine, but to all appearance it was normal. Contrary to his physician's cautions, he got out of bed to wait on customers, and walked to his other store, about one hundred yards north of this one. Here "a friend" called to see him, and prevailed on him to eat some Limburgher. It is hardly necessary to state that he died with black vomit in less than twenty-four hours.

With the last two cases began the yellow fever epidemic among the citizens of

Marshall. It would be useless and tedious to detail each case. We will, therefore, attempt to trace the advance and recession of the epidemic, by dividing the whole time into periods of seven days each, and studying, as well as may be, the cases in groups.

Assuming case III, September 19th, as the starting point, the number of refugees here from Shreveport, at this time, would at least balance the number of our citizens that had left Marshall. So we will call the population at this time six thousand. From the 19th to the 26th is the *first stadium*. There were four attacked by the fever, all whites, three male and one female. Two deaths, both with black vomit, and in one it was associated with suppression of urine; all in the infected district (north and east of the public square, toward the depot); two unacclimated.

Second Stadium.—Population about five thousand; four cases, all whites, two male and two female; two deaths; two unacclimated. One case was just across the street from where case IV was last sick, and two were a block northeast of him. There seemed to be a remission at latter part of first and beginning of second stadium. We were having occasional showers, with oppressive heat after each, followed by a cool change.

Third Stadium—October 3d to 10th.—Population of infected district about one thousand. Thirteen cases, all whites, two females. Three unacclimated. Four deaths; two with black vomit, one with suppression, one unknown. Two of the cases were three blocks northeast of the billiard hall, and five were one block northeast from case four, and next door to the two cases mentioned in second stadium. One case was on same block with the billiard hall, about midway between it and case four; two cases were near the depot, and two were about a quarter of a mile northwest of the billiard hall. These last two had just moved from the Bethea House, where the five cases were. The disease did not spread in the neighborhood of these two cases. On account of the rapid spread of the fever this week, people scattered from the infected district to other parts of the city, and to the country, leaving at the end of this stadium not more than five or six hundred in the infected district.

Fourth Stadium—October 10th to 17th.—Thirteen cases; all white; one female. Nine unacclimated. Six deaths; three with black vomit, one with suppression alone. Others not reported. All these cases but three were north, northeast and east of the billiard hall. One died in the country, having moved from a boarding house in the infected district, to a healthy country locality. None other of the household had it. No baggage was taken from town to the country by this patient. Two cases were one block west of the public square, both of which had their place of business in the infected district, where they remained during daylight.

Fifth Stadium—October 17th to 24th.—There was a cold, continued rain throughout the most of this week. Population of infected district not more than three hundred. There were twenty-nine new cases reported, three of which were among the blacks. Fourteen unacclimated. Fourteen deaths; two with suppression, and one with black vomit; four with suppression and black vomit combined. All but three of these cases were in the district between the public square and the depot. Of the three, one was half a mile northwest, and one a block south of the square; don't know the exact locality of the other. Both of the two spent much of their time in the infected district, but I am not aware of exposure to any particular case. The fever did not spread from either of them, in the families with whom they were sick.

Sixth Stadium—Population about the same. Seventeen cases; all whites; two females. Eleven unacclimated. Four deaths; one with suppression and black vomit; two with suppression alone; cause of not reported. One of the other cases stated that he had yellow fever in New Orleans in 1853. He came here as a nurse from that city. All the cases were exposed in the infected district up to date of attack. All save one were sick north and east of the public square. There was a white frost and cold rain during this week.

Seventh Stadium—October 31st to November 7th.—Slight increase of population by returning refugees. Five cases; four whites; four males. Two unacclimated. One death with black vomit. Three in the infected district; one northwest of the square, but had frequently been in the infected district; one was south of the town, who had also been exposed in the infected district two or three days before his attack. There was a freeze on the 6th of November, by clear, cold weather.

Eighth Stadium—November 7th to 14th.—Three new cases; two blacks; all male. One unacclimated. Two deaths; one with suppression, one not reported. One of the cases was exposed to the fever at a house one mile and a half south of the square, where a patient was sick who had contracted the fever in town. It spread to no other member of the household but this one. Another case (colored) lived some distance from what is called the infected district, but some clothes, belonging to a woman who had died in the infected district, were taken to his house. On the day thereafter he contracted the fever and died.

Ninth Stadium—November 14th to 21st.—Four cases; all whites; one female. All acclimated. One death with suppression and hemorrhage from bowels, gums and nose. Two of the cases had remained in the infected district during the entire epidemic, and one had nursed several cases. He had been exposed to previous epidemics elsewhere. This was his first attack. The female was six months advanced in pregnancy, but had a mild attack of the fever, and went the full term before delivery. Two of the cases (Sloan and Clark) left the city before the epidemic had made much progress. On the 27th day of October Sloan came to town and remained until the 31st, sleeping in a room that had not been ventilated nor the bedding aired. This was on the northern border of the square, and in a house much frequented during the epidemic. He was taken sick on the 14th of November, and had a well marked case of yellow fever. Clark returned to Marshall shortly after Sloan. His place of business was at the same house as Sloan's, and he was frequently in the room above mentioned. He drank to excess several days before his attack, and, at first, his disease was thought to be from this cause, more especially, as he claimed to have had yellow fever in Shreveport in 1867. But as his present attack developed, there was yellowish hue of the skin and conjunctivæ, tumefied gums that bled, black vomit stools; urine almost a solid coagulum when heated, and finally suppressed.

Tenth Stadium—November 21st to 23d.—No new cases after the 23d. Three cases; all whites; two male. One acclimated. No deaths. One of the cases had been absent during the epidemic and until after frost. On his return, he occupied (at night) a room on the south side of the square, that had not been ventilated. Another had remained during the epidemic, and had nursed a case of the fever during the third, and another during the sixth stadium, both in well ventilated rooms. He afterwards nursed Sloan seven days, ending the 21st of November. This room was not comfortable, having no fire, and the weather very cold. He

remained here day and night, and was much fatigued by his duties as nurse. On the 23d of November he was taken down with the fever, but had a mild case.

We have only embraced those cases that have been reported. There were, doubtless, many in the city that have never been reported, probably enough to make the total number one hundred and twenty-five. There was always more acclimated than unacclimated population in every part of the city, but the population of the latter to the former was much larger in the infected district than elsewhere. There were sixteen cases of black vomit, of which two recovered. Seven cases of fatal black vomit were associated with complete suppression of urine. Patients with black vomit were always found with albuminous urine when this excretion was examined. There were seven cases of complete suppression without black vomit. Complete suppression was always fatal. There were some few signs and symptoms that physicians here came to rely on more than any others, to wit: red, swollen gums, that afterward bled at the alveolar border; a peculiar glazing expression of the eye; pain (or uneasiness) in the epigastrium on slight pressure; pulse falling from 120 or 140, in first stage, to below 60 during convalescence. In one case it went as low as 34. This case lingered for five months and died with symptoms of softening of the brain. As to treatment, I expect everything was done that is usually done during the epidemics of this fever, from calomel, opium and quinine, all the way up to a masterly inactivity. Nothing seemed to arrest the disease, but much could be done for relief of suffering and warding off bad consequences. Morphine was given by several early in the epidemic, but I am sure I have seen the worst effects without any good. It seemed to affect most unfavorably those threatened with suppression of urine. Dr. Marks says he used paregoric without bad effects ensuing. Chloradyne, chloral hydrate and bromide of potassium were used, but none of them became a favorite. Counter-irritation and ice, locally, seemed to answer for relief of pain better than anodynes. Nausea and vomiting were best treated by opening constipated bowels (with mercurials, castor oil, or enema) and using counter-irritation and giving bits of ice. Bicarbonate of soda seemed to be grateful to the patients. Dr. Thomas reports benefit from three-grain doses of oxalate of cerium. In one of the cases of black vomit that recovered, there were used bicarb, soda and ice; in the other bicarb. soda, plumbi actetat., and iced champagne. Diuretics, digitalis and nitrate of potash (separately and in combination), sweet spirits nitre, and infusion of flaxseed. The last two, given together, were most used. No case of suppression, verified by catheter, recovered, no matter what the means adopted to relieve. So-called relapses were rather numerous. There was nothing distinctive in this second fever, either as to the period of convalescence at which it came, or symptoms, or its clinical history. Some were from over-fatigue; for rest, without any medicine, relieved them. Some were from errors of diet. There seemed to be great danger of this soon after the beginning of convalescence. Some were intermittent, and quinine would abort them. Some, reported as relapses, were patients who had not enough vitality left to recover from the effects of the blood poison on the system. They would linger for weeks or months, and finally succumb. None of the relapses were like yellow fever.

Post-mortems—There were only two during the epidemic, made by Drs. F. H. Johnson, C. Brooks, and myself; one was upon the body of Mr. G., who died suddenly (at a house where the fever was prevailing), after a few days malaise. "Rigor mortis" (five hours after death) was considerable. No signs of bruises. Arcus senilis in both eyes. His age was about forty-five years. Tissues cool; muscles

red and healthy looking; bowels of leaden color, and slightly distended; stomach distended with gas; contents about one pint of slightly greenish-colored liquid; thought to be quinine and whisky, given just before death; liver of distinctly yellow color all over; incision with scalpel showed it to be almost bloodless; when squeezed, large drops of blood oozed from the cut surface, some three or four lines apart. A large dark clot of semi-coagulated blood lay in the right hypochondrium; was plainly visible as soon as the abdomen was opened; it extended from below and in front of the right lobe of the liver, backward and upward, behind and above the organ, between it and the diaphragm. In removing the viscera, to ascertain the source of such a hemorrhage, we used as great care as possible in the necessary hurry. We had excluded every source save the portal circulation; but while attempting to get a view of the portal veins, by holding the liver upward, very slight traction being made, the attachment by the portal vein gave way just at its bifurcation to the right and left lobes. There were no signs of degeneration of the circulatory system, except fatty degeneration of the walls of the heart, believed to be acute. (This man had always enjoyed remarkably good health up to his last illness. He was a farm laborer.) One kidney was a little pale and flabby; the other appeared healthy; bladder had small quantity of very turbid whitish urine; he had not passed urine for twenty-four hours before death; spleen rather smaller than natural. The other was the body of Mr. L., who died second day of his disease, with black vomit and suppression; post-mortem three hours after death; whole surface very yellow; liver of the same yellow color found in case one; both kidneys pale and flabby; the pelvis of one had an ecchymosed-looking spot, three lines long by two in breadth; bladder contained very small quantity of turbid urine; spleen smaller than natural; stomach contained large quantity of black vomit material; the blood taken from the large vessels near the heart was of nearly a scarlet color. I put some in a vial and placed it in a cool place for twelve hours. It appeared slightly congealed, but was easily shaken into a fluid state. I dropped some on filter paper, but could not detect any yellowness about the stain.

Some of the cases that occurred in Marshall seem to have an important bearing on the question whether or not this disease is "catching."

I. Mrs. Rogers; lives one mile south of the square. She once visited Mrs. Harden, who was very low with yellow fever, in the infected district. She remained not more than one hour in the room and then returned home. Eight days thereafter she was attacked with yellow fever, but her case was a mild one. Nearly every member of this family that remained in the house successively had a fever, which Dr. Marks was inclined to think was yellow fever, though in a very mild form. One reason he had for this opinion was the immunity from fevers they had all enjoyed up to the time Mrs. R. had yellow fever.

II. Miss McPhail; also visited Mrs. Harden about the same time Mrs. R. did; remained but a short time, and returned to her home, two blocks west of the square. This was the only exposure known. Her fever came on within a day or two of Mrs. R.'s, and she died the third day, with black vomit. The family scattered to the country and the house was fumigated. No other of its members were attacked. It is well enough to remark that the room (Mrs. Harden's) in which the above cases were exposed had an unusually offensive odor. It was so putrid that a "carpenter was sent for to remove the ceiling and look for dead rats;" none were found, and the attending physician had no doubt the odor was from patient's body.

III. E. Baker nursed two cases during the epidemic, both in well aired rooms,

and not in the infected district. He also nursed Sloan, in the room where, it is believed, Sloan contracted the disease after the twelfth of November. Two days after he left Sloan, he himself was taken down with the same fever.

Urine.—Forty-five or fifty specimens of urine were chemically examined, from as many different cases; albumen found in thirty-seven, which were generally the worst cases. Fifty-five cases are noted down as having naked eye appearance of muddy cider when shaken up. Of these, the deposit was chemically and microscopically examined in twelve, and in every case found to consist almost entirely of —— of ammonia and soda. My thanks are due my associates, Dr. Eads and Drs. Marks, Thomas, Brooke and Johnson, for reports of cases, and for other valuable aid in obtaining data for this report.

The Fever at Ford's.—Mr. Ford and family lived on an elevated site in the pine hills, two miles and a half west of Marshall. The hill slopes sufficiently for good drainage, and there is no obstruction to free circulation of air. The dwelling is a single story, double log cabin, weather-boarded and ceiled, and raised at least two feet from the ground; windows enough for ventilation; an L runs back, and a wide hall separates all the rooms. The proprietor kept a public stand for travelers, and especially beef drovers with their herds of cattle. All bedroom was economized. The cattle pen was two hundred yards east of the house, and to it was attached a slaughter pen, at which, daily, several beeves were slain for the city market.

I am indebted to Dr. F. H. Johnson, the attending physician, for a report of these cases.

Young Mr. Holloway, his mother, and Mrs. Keeting and child (refugees from Shreveport), went to this house early in September, 1873. Young Holloway was sick when he arrived. On the fourth day he died, with black vomit. His father came from Shreveport the day before the son died. In a few days he was attacked with the fever, and on the third day died, with black vomit. Then, in a short time, the mother was taken down with the disease. She convalesced, but finally (five weeks after attack) succumbed to hemorrhages from various mucous membranes.

These refugees had taken their baggage to this house and it was freely opened.

The second or third week the fever attacked a member of the Ford family, and one after another had it until every member of the household was either dead or sick from yellow fever. This included all the nurses, except those protected by previous attacks. Among them were three negroes, all of whom recovered. One of the first cases (after the Holloways) was a Mr. Buck, who was never allowed to go about the house, unless to bring water and make fires, and who slept in an outhouse fifty yards from the dwelling. About three weeks after Holloway arrived, Miss Lula Ford left home, as a protection against the fever, and went to stay with her brother, a mile and a half distant. She took no baggage with her, and had no communication with home, by which fever germs could have been transported. Within a week she had the fever. Her sister-in-law nursed her, and during Miss Lula's convalescence she was attacked. Her husband informs me that she had, some two weeks before, visited the Bethea House, which, we will recall, was almost the focus of infection in the city. There were eighteen cases among the Fords, of which eight were fatal. Four deaths from black vomit; two from hemorrhage; one from suppression of urine, and one from large abscess in each lung, that broke into the bronchial tube.

John H. Pope, M. D.

YELLOW FEVER IN CALVERT, TEXAS, IN 1873.

Permit me, while occupying a convalescent's chair, to give you a brief account of the epidemic which has just ravaged our little village, and which, it is probable, would still be raging but for the want of subjects. Calvert is situated in a low sand-flat on the Houston and Texas Central Railway, one hundred and thirty miles north of Houston, and five miles from the rich Brazos bottom. It has been one of the healthiest points on the road until this summer, but our authorities had not adopted any sanitary regulations, and Main and Railroad streets were in rather a filthy condition. A mile and a half south of us, directly on the railroad, is a beef packery, where a great number of beeves are slaughtered every winter. The entrails, heads, and refuse parts are thrown out, and left to decay and fester in the summer's sun, producing an awful stench, which is often wafted by our prevailing wind even as far as the town. Not very pleasant, certainly, and calculated to engender an atmosphere suitable for the propagation of almost any poison which might be introduced here—the yellow fever germ would not ask for a better. During the months of July and August we had an unusual number of cases of malarial fever, of a very obstinate and unyielding character, though few of them proved fatal. On the 3d of September a young man named Hughes arrived here, fleeing from yellow fever in Shreveport. He had been in business there as a clerk, and the fever had been prevailing for some time before he left. He was very much excited and alarmed when I first saw him. On the night of the 5th he was taken with a chill, and I was asked to see him twenty-four hours afterward, in his room at the Hayne's House. He presented all the characteristic symptoms of true, genuine yellow fever, of the most malignant character. The upper portion of his face was of a dark purplish hue, the temperature high, and the pulse, which had already reached the maximum, was beginning to decrease. The tongue was heavily coated, and he complained of soreness of his throat. I ordered three compound cathartic pills, and a mustard foot bath. The next morning the pulse had reached eighty-four, and was still steadily decreasing, the temperature being rather on the increase. The mucous membranes of the mouth, throat and nostrils had become spongy, with tendency to hemorrhage, a considerable quantity of dark, black blood being discharged from these surfaces during the day. The following morning—Monday, September 8th—his pulse was down to sixty, and the temperature almost normal. Had he remained quiet he might possibly have recovered, but feeling much better, he concluded to change his boarding house, and without consulting me, got up, dressed, and walked the distance of two blocks to Main street, and took a room up stairs in a brick building. On visiting him an hour afterward I found all the symptoms aggravated, with incipient delirium, and his body turning very yellow. He continued to grow worse, and died about 6 o'clock on the morning of the 10th, throwing up a small amount of black vomit. The day before he died, I requested two prominent physicians of the place, who afterward fell victims to the fever, to see him with me and diagnose the case. They both refused, stating they had never treated yellow fever, and did not wish to expose themselves and patients to sporadic cases. After his death I pronounced it a case of yellow fever, and made the attempt to have the bedding burned and the room fumigated, and got laughed at for my pains. Several parties who had had the fever elsewhere, and who "knew more about it than any doctor," visited the dead body, and hooted at the idea of its being a case of yellow fever. So much was said about the "Coleman fever," as it was called upon the

streets, that I thought it prudent to remain silent and let the community find out for themselves, as they would not listen to my advice. The disease never had a better opportunity to spread than it did here. The bedding upon which Hughes died, instead of being burned, was thrown upon the roof of a little house almost at the foot of Main street, and left there three weeks in the sun. The prevailing wind blowing almost up the street, the whole town soon became impregnated with the poison. On the night of the 10th I was called to see the clerk of the Haynes House, who had waited upon Hughes while he was in the house. He was feeling very badly, and was very much alarmed lest he was taking the fever. I quieted him, however, and gave him some simple medicines, but in two days he was down with a well-marked, though mild attack of yellow fever. He made a very good recovery, but subsequently relapsed, and died with black vomit. In a few days I was called to a young Jew, who had slipped into town with the fever on him. I never could learn exactly where he was from, but was pretty well satisfied that he came from Shreveport. His case was as well-marked as the first, and he was very sick for eight days, but finally recovered. In ten days, several cases had occurred in different parts of town, no one else, as yet, believing it yellow fever but myself. On the morning of September 23d, Mrs. Haynes, proprietress of the hotel, was taken sick, and died on the morning of the 27th, with black vomit. I immediately called a consultation of all the physicians in town, and Dr. Morrison, from Hearne, and insisted upon their visiting all the cases on hand and deciding what the disease was. They visited three other cases, which afterward died that night, one of them throwing up black vomit freely at the time of our visit, and agreed with me that it must be yellow fever. This decision of ours of course produced a panic, and every one who could, began making hurried preparations to leave. By Monday morning there were not more than six hundred white persons left in town, who had resolved to stay, and very few of these had ever had the fever, but they were afraid the poison was already in their systems, and they concluded it would be safer to remain in town, where they could be treated for it. I learn that a great many who did get away had the fever elsewhere, and some died, and in some instances it was communicated to the country people.

On Sunday night, September 28th, while visiting a patient, I was taken with the fever and went home to bed. Monday morning the authorities telegraphed to Houston for aid. Three physicians were sent up to examine into the disease and report. Two of them, and one an old physician of forty years' experience in your city, after remaining here twelve hours, decided positively that there was not a case of yellow fever in town, and returned. Dr. Howard, who had taken charge of me, remained, stating that I had yellow fever, and that there were several other cases in town. He stayed until Friday, and left me convalescent and able to sit up. Unfortunately, my friends commenced sending for me, and I could not refuse to go, though really too weak. My own children were taken down with the disease, and having to be up with them at night, I relapsed in a few days and came very near dying.

I will say here, I do not understand why so many physicians who have frequently treated yellow fever, so often fail in their diagnosis of the disease in the commencement of an epidemic. While I had the first case on hand, I was deeply interested in studying Dr. J. C. Faget's communication in the September number of your journal, which, by the way, is the ablest article I ever read upon the subject. His description of the type and specific character of true yellow fever is so lucid as to render its diagnosis as easy as that of variola, or cholera, and any intelligent physician who

studies that article ought to be able to recognize a case of pure uncomplicated yellow fever wherever he meets with it.

Well, the decision of these old yellow fever practitioners rendered my opponents jubilant, and the "Coleman fever," as it was termed, was allowed to have its course once more. What could he, a little village practitioner, know about yellow fever, said they, when these city physicians had decided *positively* that there was no sign of the fever here. However, by Saturday, October 11th, there were so many sick and dying, that more physicians were telegraphed for, and a delegation of fifteen from Galveston, Houston, and other points on the road, arrived Saturday night. They immediately visited two cases in the Haynes House, decided at once that the disease was yellow fever, and were ready to go back by daylight. They returned the following morning, leaving the community in as bad a fix as ever. I was up, but ought to have been in bed, and there were only two others of our local physicians able to be out, and they were broken down, and fell victims to the disease in less than ten days. The rest of our local faculty who were not sick had found it very convenient to go to the country. Among them was a prominent medical person who had been doing, according to his account, seventh-eighths of the practice here this summer, and had not met with a single case of yellow fever. He left three of his patients dying with it, two of them throwing up black vomit at the time. He is now in a city not a thousand miles off, perhaps discoursing of "what he knows about yellow fever."

By the following Sunday, October 19th, we were in a deplorable condition. I had relapsed badly. Dr. Field was dead and Dr. Gilson dying. There were over a hundred sick with the fever, and they were dying six or eight a day. On Monday a delegation of physicians from Houston and Galveston arrived with nurses, rolled up their sleeves and went to work in earnest. I fell into the hands of that old veteran yellow fever physician, Greensville Dowell, of Galveston, who had volunteered his services, and, thanks to a kind Providence and his skill, I and my children, six cases in all, recovered without the loss of one. I shall ever hold him in grateful remembrance for his untiring attention, and for the words of cheer which were ever ready to fall from his lips. May Heaven bless him in his declining years.

It is impossible to give a correct estimate of the number of persons who remained in town, or of the number of cases; the different estimates vary from four to six hundred. I have written to Dr. Dowell for his estimate, but have not yet heard from him. Our village contains a population of about fifteen hundred whites, and since my recovery I have driven over town, and counted a little over six hundred remaining here. Of these, at least four hundred and fifty had the fever, and one hundred and twenty-five died—an awful mortality. Among that number were four physicians, two of our resident physicians, and two of the noble volunteers who came to our aid. They immortalized themselves, and now fill the graves of earth's noblest heroes. Peace to their ashes. There were more relapses in this epidemic than I had ever seen before, and many of them fatal. Some have occurred six weeks after the first attack. The pulse of the majority of those who have recovered is exceedingly rapid, varying from 90 to 120 per minute. My own has never been less than 90, showing that the heart is the organ most seriously affected by the poison. I have made several examinations for life insurance among the convalescents, and they will not pass, on account of the rapidity of the pulse. Pregnant females have escaped better than was ever known before, there being a good many here who had the fever, and not one has died.

I feel constrained to give my humble views upon the origin of yellow fever, from the fact that two of the oldest physicians who came to our aid contend that it originates wherever it prevails, and that this fever had its origin in our midst. I thought it had been conceded, and admitted, and *proven*, by the profession generally, that the germ, the materies morbi of yellow fever, could be conveyed in woolen goods, the holds of vessels, and the human system, from one point to another. This has been so clearly proven to my mind I had put it down as *one* of the *fixed facts* of yellow fever, but from reading the different articles published from time to time upon the subject, one is led to believe that there is no fixed fact in regard to yellow fever. The physicians all over our Southern country have made themselves a laughing stock for the public by their crude and undigested views about this disease, and by their wrangling and uncertain diagnosis at the commencement of every epidemic. No wonder the people have lost confidence in the profession, and when an epidemic occurs, take the treatment of the disease into their own hands, as they did here, nurses interfering with and taking the place of physicians, thus causing an immense death rate. If this fever was not introduced here by Hughes, the refugee from Shreveport, then there is nothing certain under the sun. I treated him and watched closely the course of the disease, and could clearly trace the next five or six cases to him. It is on record that the fever was introduced into New Orleans on the 4th of July, direct from Havana, was carried from there to Shreveport, and from thence to Memphis and this place. I differ not only with these two gentlemen, but I expect I differ with the majority of the profession in regard to the origin of the disease, and no amount of reasoning, aside from facts, can ever convince me that the disease is indigenous to the United States, or that a case *ever* originated within our boundaries. It has its origin in the torrid zone, from what condition of things we know not, and in every epidemic that has occurred in our country, where an authentic account of its origin has been kept, it is proven to have been imported from a foreign port. During the war, when the Southern coast was closely blockaded by Federal vessels, no yellow fever occurred west of the Mississippi, except in Houston, and that was introduced via Mexico. The germ which constitutes the specific poison of the disease is undoubtedly an animalcule, a living, organized existence, which requires a certain amount of heat, moisture, and probably decayed animal and vegetable matter in the atmosphere for its sustenance, and whenever it is introduced into a locality where the atmosphere contains these necessary ingredients, it propagates and spreads with almost the rapidity of thought. These animalculæ are introduced into the human system through the medium of the air passages, directly into the arterial circulation, and of the effect they produce there I will speak more fully under the head of treatment. I truly hope and believe ere five years have passed, the whole profession will be thoroughly convinced of the exotic character of this fell destroyer, and that ere another epidemic devastates any portion of our country, they will have learned its characteristic symptoms, so as to be able to recognize it wherever they meet with it.

In regard to the diagnosis of yellow fever, I am not yet prepared to give to the public all my views, and I am still too weak to enter into an elaborate discussion of any of the facts connected with the disease. Suffice it to say there are characteristic symptoms belonging to the true uncomplicated disease, which are as unchangeable as those of variola, and when once seen and understood are never to be forgotten. The people, and many physicians, contend that every epidemic is different from the preceding, but I will never admit this. They say the disease is constantly changing and that there are no symptoms which characterize it, by which it

can be readily recognized. I have been studying yellow fever since 1855, and I see no difference between the fever of this year and of that, or of any epidemic that has occurred since then. I speak of true, genuine, uncomplicated cases. Of course the disease is modified and changed, more or less, by the locality into which it is introduced, and where it is complicated with malarial fever some of the characteristic symptoms are wanting, and it does not run the regular course of a pure case. From my observations in this epidemic I am satisfied where a person's system is fully saturated with the miasm which produces intermittent fever, it is difficult for the yellow fever poison to find an entrance. Nearly all the cases which are occurring now, at the time of this writing (November 15th), are in persons who have been suffering with chills and fever during the summer, and who, though exposed all the summer, have resisted the yellow fever poison until now. They are nearly all fatal cases. At the first glance it would seem they are the first persons who ought to be attacked, but there seems to be a kind of incompatibility between the two poisons, not complete, for the two diseases are often found in the same patient, though I think the poison which is most firmly established holds the other in abeyance until it runs its course. Where the yellow fever poison is introduced into a northern latitude, and finds a suitable temperature and atmosphere for its propagation, it prevails with more virulence, and there are more pure, genuine cases than in a southern latitude, owing to there being less malaria.

When we come to the treatment we find a greater diversity of opinions, if possible, than in regard to the origin and symptoms. A great many persons have become skeptical about treatment, and say physicians do no good, and really, to the calm, reflecting mind, after reviewing the different and sometimes directly opposite methods of treatment, it does seem as though a greater number would recover without medicine than with it, provided they could be kept in bed and properly nourished. Now the intelligent physician should always have his indications clearly defined in his mind before he attempts to prescribe for any disease. What are the indications of treatment in yellow fever? This will depend upon the view each individual practitioner takes of the action and effect of the poison in the system. And here I must say I differ with Dr. Faget when he says, "this specific action of yellow fever poison on the heart can be compared to the effect produced on that organ by certain poisons, as, for instance, digitalis and veratrum viride." The action of these natural poisons on the heart is produced through the medium of the brain and nervous system, and as soon as their effects wear off the heart resumes its normal action, because the blood has not been corrupted or destroyed by them. In yellow fever the poison, as I have said, is introduced directly into the arterial circulation, and its first effect is to rapidly destroy and impoverish the vital stream, rendering it unfit for the nutrition of tissues. The heart, through which it has to pass, failing to receive its natural stimulus of pure, healthy blood, soon begins to fail in its action. The brain, liver, kidneys, and other organs not finding the material necessary for their nutrition and the performance of their functions in this poisoned stream, also fail in their natural action. Soon all is confusion and distress throughout the animal mechanism, and the pain, nausea, and other sufferings of the patient are manifestations from the different organs of the presence of the invader. The failure of the various organs to perform their duties of assimilation and elimination increases the trouble. The red corpuscles of the blood being rapidly destroyed by the poison, and the effete particles of every part of the body retained in the circulation, and not thrown off by the emunctories as usual, the vital stream becomes so

polluted as to be totally unfit for the wants of the system. The heart, the mainspring of life, finding no more pure blood sent to it, loses its vigor and takes on that *feeble action characteristic* of the disease, and finally ceases its action, because the blood, the life, has been destroyed and disorganized by this specific poison. The increase of temperature in the first stage of the disease is easily accounted for by the increased combustion in the lungs in nature's first effort to rid itself of the poison.

If my view of the action of the poison is correct, then the indications of treatment are very clear, viz., to bring into action all the excreting and depurating forces of the system to eliminate this poison, and to remake the blood as rapidly as possible. I do not pretend to say I have discovered a plan of treatment which will accomplish this end, but I do say, that we need no digitalis, veratrum viride, calomel, or other potent nerve-depressor in this disease, for they will only act on the side of the enemy. I believe if that combination of "Blair's abortive"—the twenty and twenty-four quinine and calomel mentioned by Dr. Gilmore—had been administered to every case here, there would have been double the number of deaths. From my observations, the majority of those who got quinine and calomel in this epidemic either died or made bad recoveries. I am seeking truth, and am not prejudiced in favor of any particular plan of treatment, but would gladly use anything that promises to accomplish the indications mentioned.

Keeping in view, then, the fact that the poison is rapidly destroying the blood, the life of the patient, I endeavor, by exciting the skin and kidneys to increased action, to make them throw off as much of it as possible. I generally administer the usual cathartic, a dose of castor oil, and the mustard foot-bath, though if I see the patient in the cold stage, and he has a full stomach or any nausea, I relieve that by an emetic of *warm water*. After the establishment of the hot stage, I allow him plenty of cold water, and at the same time, without reference to the pulse or temperature, commence with the following prescription, in which I place my main dependence, viz:—

R.	Tinct. ferri. mur.,	℥ij	
	Spirits ætheris nitrici,	℥ss	
	Glycerine,	℥iss.	M.

Sig.—Teaspoonful in a little water every two or three hours.

I sometimes vary this prescription by using a drachm of potass. chlor. in place of the spirits nitre, from its known power of imparting oxygen to the blood. This combination is a good tonic, and at the same time a powerful diuretic, and will incite the kidneys to action when everything else fails. While administering the above, I order everything which I think will conduce to the patient's comfort. If his head aches, apply cold cloths or ice bags; keep the feet warm; rub the spine and extremities with a stimulating and anodyne liniment; apply mustard plasters all over the stomach and abdomen if there is any pain or tenderness in these regions, and continue their application, if necessary, until desquamation will take place in the end; keep him in a gentle perspiration, but never allow him to sweat profusely. As soon as the pulse reaches the normal beat in its downward course, I order a spoonful or two of some *liquid animal* food, to be given every two hours, and two or three times a day a hot milk punch or egg-nog. And I impress upon the attendants the necessity of administering the nourishment and stimulants whether the patient relishes them or not. I feel certain that Dr. Dowell saved my life by his explicit directions upon this point; for when he reached me, I am satisfied that at least one-fourth of my blood had already been changed into black vomit, and was being deposited in

the brain and other organs. I was partially delirious, but my wife had administered my doses regularly, but could not get me to take nourishment. I loathed all food, but the doctor said that unless I took some, the disorganized blood would soon begin to ooze into the stomach, and death would end the scene with black vomit. For the burning pain frequently complained of in the stomach, I give three grains cerii oxal., and if there is much acidity, I order lime-water and milk, or prepared chalk. The above is a brief outline of treatment which has proved most successful in my hands. It fails, as all other methods do, at times, and in the present condition of our knowledge of medicine, many will continue to die of this disease in spite of all the remedies we use. But I believe the time will come when we will discover the true antidote. I have been using for several years past, with great success, the hyposulphites and sulphites of soda, lime and magnesia, in the treatment of all zymotic diseases, and had conceived an idea that they would act well in yellow fever; but the time in which we have to work is too short, and even if they were to prove antidotes, the patient would die before we could build him up and remake his blood. It is possible that they would be good prophylactics. W. L. COLEMAN, M. D.

EPIDEMIC IN CALVERT IN 1873.

Among those certainties in medicine established by observation, is the nosology of fevers, for nature, whether for our good or ill, works always by regular laws, and the laws governing our different fevers are as distinct and regular as the laws of crystallization in chemistry; and whoever may have had the opportunity of witnessing the phenomena of that disease called yellow fever, in any locality where it has prevailed, either North or South, could not have failed to remark that it followed a strict morbid law, differing in its train of symptoms from those of any other disease contained in our nosology of fevers, and that its division into three stages by medical writers is not arbitrary, but a true and faithful copy from nature, and constitutes the pathognomonic phenomena of true yellow fever.

Its first stage, more constant and cardinal than the two others, unlike sympathetic or other forms of fever, is so sure a diagnostic sign, that, when in its place the symptoms of cases are intermittent, or remittent, and end in black vomit, such cases are not true, acclimating yellow fever. By the first stage I mean that one paroxysm from twenty-four to seventy-two hours' duration, ushered in by a marked pain in the back of the neck, and violent cephalalgia in the supra-orbital and frontal region. This paroxysm is uninterruped from end to end, and every abortive method with a view to shorten its duration, or create a remission, has hitherto most signally failed. Having run its own spontaneous course, it is followed by *the second stage, of marked repose*, of no fixed period of duration, with a weakness commensurate with the violence of the first stage, and, if not turning to convalescence it passes to the third stage, of sinking and fatal exhaustion, either with or without black vomit. Again, the habits of this disease are such that it confers complete security against a second attack, and seldom, if ever, spares a stranger.

As this discussion is to be limited to the topography of Texas, I shall not travel out of the record, to compare the epidemic which in 1873 began in the cities of Galveston and Houston, and culminated in Calvert and Columbus, with that of Memphis or Shreveport, but test it by the above described standard of true or acclimating

yellow fever; and if no cases within the range of its mortality have borne the stamp, (*i. e.*) the pathognomonic phenomena of the disease, we must account for the occurrence of black vomit and mortality, independent of that specific poison or atmospheric change giving rise to endemics of true yellow fever.

I call your attention to the fact that modern writers, especially La Roche, make use of the term *true yellow fever*, implying thereby the occurrence of the black vomit and hemorrhages in malarial, typhus, or other diseases: "A fever of an intermittent or remittent type occures and terminates in black vomit and the hemorrhages." (Report of Sanitary Commission, p. 325.) The Southern Medical journals of late have made reports of hemorrhagic remittent fevers (Vide N. O., 1869, and Charleston Med. Jour., 1873), and these cases have been called by the unprofessional black jaundice, and when the same disease has made accidental election of the stomach instead of the kidneys and mucous membrane of the bladder, for the hemorrhage, and black vomit ensues, the exactitude of science forbids us to change the name of the disease and call it yellow fever, if the latter be a distinct disease; and I trust that a tolerance in the difference of opinion will not withhold an impartial judgment when I take issue against the popular belief, and contend that the epidemic which in 1873 swept over many of the towns in Texas was the same disease throughout, and that it did not bear the marks of true yellow fever, for a lover of truth will never reject facts because they contradict an old belief. Three cases of the disease which came before me, showing a hemorrhagic tendency, I will relate: First, that of a young lady of sanguinous, lymphatic temperament, to whom I was called in the height of the second access of fever, which was very turbulent and alarming; after about eight hours' duration a decided intermission took place, and the case yielded most happily to the sulphate of quinine in bold and repeated doses. A profuse hemorrhage (epistaxis) took place on the second day of my attendance, and I have not the least doubt but that a third access, uncontrolled, would have ended in fatal black vomit; yet this case was not yellow fever. The second was a case which I saw at Calvert, of precisely the same character, and in the first access; it was the case of Mrs. M.— The symptoms were very turbulent; there was an apparent struggle between a chill and reaction; a vomit seemed to be indicated. It was then about midnight, and I found Dr. Stuart within the hour. He saw the case with me and prescribed 30 grs. pulv. ipecac, with orders to give it at once. On our return to the case, about 10 o'clock next morning, we were told that the medicine had not been given. We found the patient without fever; there was a marked intermission. We did not prescribe anything at this second visit, because we were about to leave that day on our return to Houston. I afterward heard that the case ended with black vomit on the fifth day of the disease, and the time of that lady's death corresponded exactly with a third and fatal access of a malignant intermittent, which the French medical authors term *fievre pernicious*, and which seldom, if ever, survives the third access. And this case did not exhibit the pathognomonic phenomena of yellow fever. The third case was a patient of Dr. Nutt, a stranger in Houston, by the name of Bartlett, living on Main, above Bell street, who had been sick five weeks with the fever that then prevailed. He had not got up from his bed; was perfectly yellow. I was called to him on account of black vomit, which alarmed his family. The quantity was about eight or ten ounces. The patient got well. Now, if the black vomit had occurred on the fifth day instead of the fifth week, and the man died, would not the case have been called yellow fever?

REMARKS.

The first two cases were malignant intermittent, and the third (Bartlett's) protracted remittent fever, and all of them hemorrhagic malarial fevers. None of the cases that I heard of had the symptoms of yellow fever, and the only resemblance to it was that of a few terminating in black vomit. Now, what is black vomit and its value (*per se*) as a diagnostic sign of yellow fever? Dr. Physic, of Philadelphia, during the yellow fever of 1793, in making autopsies, opened a stomach, and found upon careful inspection that the hemorrhage producing the black vomit contained in the stomach had issued from one side of it only, and that this side was evidently relieved, while the opposite side was highly congested. Now, for its production a certain degree of congestion would seem to be implied, which nature makes an effort to relieve by a hemorrhage, and the blood mixing with the gastric acid is turned black as sure as an infusion of nutgalls, by adding iron, in making ink: and this form of congestion, whether active or passive, is not dependent on any specific cause, yellow fever, or any particular form of disease. It has occurred from mechanical injuries to the stomach from the kick of a horse (reported by Dr. Mouges, of Philadelphia); by the action of corrosive poisons, when swallowed (by Waring and others); it has occurred in gastro-enteritis (reported by Dr. Dickson, of South Carolina); by vomiting in pregnancy (reported by Dr. Nott, of Mobile); in the last stage of puerperal peritonitis, or fatal cases of childbed fever (by Hulme, Evans, Dewees and Meigs), and would seem to be much more constant in the termination of this disease than in yellow fever itself.

Extract from a letter from Dr. C. D. Meigs, Professor of Obstetrics, Philadelphia, to Dr. La Roche: "I think that fatal cases of this disease will rarely fail to be attended with black vomit, and this black vomit is identical with that of yellow fever. In the course of my practice I have seen fatal yellow fever cases attended with black vomit, etc., and that the ejection of that fluid is not peculiar to yellow fever."

Dr. Davy reported to Dr. Blair in 1811 that black vomit was almost absent in the fatal cases of true yellow fever at Barbadoes, and that gastric symptoms were not violent during the epidemic, and Dr. Dickson, that it was rarely seen in the fatal cases during the yellow fever of Charleston in 1817, '24, '27.

Dr. Maher, of the French naval vessel Hermione, stationed at Havana, reported in the maritime annals of 1842, "That among 323 deaths from yellow fever, black vomit occurred only in $7\frac{1}{8}\frac{1}{0}$.

Dr. Gilcrest reported that among 196 deaths from yellow fever at Gibraltar in 1828, only six had black vomit. Since, then, black vomit rarely if ever happens in all the cases which recover, and in many instances among few who die of true yellow fever, and is, after all, only a certain form of termination of the disease, and confined to a limited category of cases, and occurs so often in other diseases, it, so far from stamping the disease with individuality, is of no value by itself in determining a case to be yellow fever. Thus says Dr. La Roche:—

"These facts show, therefore, that we cannot regard black vomit as sufficient by itself to characterize the disease as being true yellow fever."

It would seem that the importance attached to the occurrence of black vomit in the olden time, as a diagnostic sign of this disease, was derived from the Spanish writers, who called the disease *vomito prieto*, instead of yellow fever, for they were the first of any nation who planted colonies in the Antilles where the disease prevails,

and the term itself embraces every case in which it may occur, so that in the eighteenth century it was believed to belong to yellow fever exclusively, and its occurrence all sufficient to identify the disease and constitute the pathognomonic phenomena of yellow fever; and this distinction has been handed down as late as the writings of Sir Wm. Pym, in the nineteenth century, who, in a letter to Mr. Greenville, of the Admiralty, speaks of black vomit as "peculiar to yellow fever, and not encountered in kindred affections."

So completely had this belief taken possession of the medical mind, that when a disease broke out among the Danish fleet, in 1788 and 1789, and the fatal cases ended in black vomit with yellowness of the eyes and skin, the disease was, and continues by some to be, regarded as true yellow fever; but considering that it prevailed in the winter and attained its highest malignity after the fleet had joined the Russian war ships in the Baltic, and that it was highly contagious—which yellow fever is not—it had none of the symptoms of the latter, "and notwithstanding black vomit and jaundice, the disease must be regarded as a ship or typhus fever."—La Roche.

Some cases of black vomit occurred in Scotland; two in Dublin; and Dr. Graves remarked "that after all, the summer fevers of Dublin did not differ from those of tropical climates.

In 1822, during a very hot summer in Paris, several cases of black vomit occurred at the Hotel Dieu, and two at the Hospital La Charité. They were all believed to be sporadic cases of yellow fever. One got well at La Charité under the influence of powerful stimulants. An autopsy on the other, who died of black vomit, revealed the unmistakable lesions of typhus or typhoid fever, and the name of yellow fever was no longer attached to the above cases. They did not present the pathognomonic phenomena of the disease.

So strong was this belief, that when black vomit occurred in remittent fevers of a malignant type, it gave rise to that old exploded doctrine that yellow fever was only a higher degree of bilious fever, and consequently not a separate disease, so that Dr. Saunders, more than a hundred years ago, stated that "miasmatic inflammatory bilious fever ran into yellow fever," and the late "Dr. Ramsey, of Charleston, S. C., in 1804, stated that neglected bilious fever frequently ran into yellow fever" (Eberle's practice); this brings on the most important point in the question at issue, *i.e.*, the not unfrequent occurrence of black vomit in malarial, and especially in our Southern remittent fevers of a malignant type, preceded by high arterial reaction, and will prove that black vomit is by no means uncommon in this form of fever. It is reported by Dr. Cleghorn to have occurred in the tertian fever of Minorca.

In the malignant bilious remittent fever of Batavia they died with black vomit from the third to the ninth day, and the fever differed from yellow fever. (Dr. Johnson.)

A malignant intermittent (fièvre pernicieuse) broke out among the French troops in Algeria, and they died with black vomit (reported by Dr. Baudin); and we find that on our own hemisphere Dr. Hildreth reported an epidemic of bilious fever which broke out in the town of Marietta, Ohio, in 1823, and that the malignant cases died with black vomit. Black vomit has been reported in some of the malarial fevers that occurred on the borders of the lakes in the interior of New York. (In the *Transactions* of State Medical Society, 1835.)

In 1850, two cases of hemorrhagic remittent fever occurred in the Charity Hospital, of New Orleans, one a boy of eight years old, and the other an Irishman, of

drunken habits. Both had been acclimated, and both had black vomit and died. (Reported by Dr. Fenner, *Southern Medical Journal.*)

In 1825 and 1827, Dr. Dickson, of Charleston, met with hemorrhagic remittent fever on Charleston Neck.

Since the war, white men who have labored in the cypress swamps of Louisiana, in splitting shingles and drinking water from the canal, have furnished not a few cases of hemorrhagic remittent fever; three of them had black vomit—the others hæmaturia.

If further evidence be wanting to prove that black vomit occurs in bilious remittent fevers, we add that of Dr. L. S. Michel, of Charleston, S. C., taken from the Philadelphia *Medical Journal*, 1854, page 318, viz.: "The coffee-colored matter, commonly called black vomit, ejected in what are called bilious remittent fevers, seems to owe its color to a mixture of acid." Again, page 435, same journal, is the following sentence: "A case commences with symptoms of common remittent or intermittent, and at its close exhibits *all the phenomena* appertaining to yellow fever." Now this covers the single case of black vomit seen at Calvert by the joint delegation from Galveston and Houston; also the previously reported cases, including the stranger from Shreveport, confirmed by the following quotation from Dr. La Roche, viz.:—

"Some may attribute black vomit occurring in bilious remittent fevers to the peculiar poison giving rise to yellow fever, yet, when we take into consideration that the cases of black vomit in question were not accompanied by any of the symptoms characterizing yellow fever (or were destitute of its pathognomonic phenomena), we can scarcely be justified in explaining their occurrence in that way."

Since the above cited cases which occurred at Calvert, and others of the kind, were wanting in the pathognomonic phenomena of yellow fever, it would lead us to infer that every subsequent case of black vomit belonged to the same category of cases, and that the disease which prevailed at Calvert in 1873 was not true yellow fever, but, in the severer cases, hemorrhagic remittent fever; for if the authority of the most eminent observers be admitted in evidence, the occurrence of black vomit in the termination of cases of remittent fevers has been proved beyond cavil or doubt. Now, if yellow fever be a distinct disease, and governed by its own legitimate symptoms, we find records of the most malignant cases of hemorrhagic remittent fevers, by Drs. Saunders and Ramsey, more than a century ago, bearing the misnomer of remittent yellow fever; and since we claim to have produced in evidence sufficient reasons to account for the phenomenon of black vomit in the disease in question, then, by a rule for philosophizing, in the Principia of Sir Isaac Newton, *i. e.: "never to assign for a phenomenon more causes than are sufficient to produce it,"* and the malignant type of remittent fever being all-sufficient, we have no excuse for invoking the name of yellow fever to explain the occurrence of black vomit, more especially when the cases producing it were destitute of the pathognomonic phenomena of true yellow fever. Now, with this view of the question at issue, how is it possible to escape the conviction that the cases of black vomit occurring in Calvert, Columbus, and elsewhere, were only aggravated forms, and of a malignant type of the same disease which in 1873 prevailed in Galveston, Houston, and in other towns in the State of Texas, aggravated by local exciting causes; for "the bilious autumnal fevers of this (Southern) country not unfrequently put on the yellow fever type, such as hemorrhage, yellowness and black vomit, when the causes productive of them are much concentrated." (Report of the Sanitary Commission, N. O., 1853, p. 286.)

Yet, in face of facts, and this array of evidence, the disciples of the doctrine of Sir Wm. Pym and the Spanish vomito, believe, even now, that black vomit occurring in autumal fevers stamps such cases with the exclusive individuality of yellow fever, and deny the occurrence of hemorrhagic remittent fever, and, whether from mechanical injuries, corrosive poisons, or fatal childbed fever, they were yellow fever, all! "Each robber seen on Hounslow heath was *Robin Hood.*"

Let us see how Dr. La Roche sets off:—

"There are not wanting those in our profession who view black vomit in the light of the pathognomonic phenomena *par excellence*, which enables us to distinguish yellow fever from every other form of febrile disease," and that "experience has proved the impropriety of carrying it to the extent they have done; that, when considered by itself, without reference to its other symptoms, and in sporadic cases, the black vomit is not sufficient to stamp the disease in which it occurs as being true yellow fever."

Of late I have become very skeptical about sporadic yellow fever, founded on anomalous symptoms and black vomit, and when it happens to any one who may have been previously acclimated by an attack of true yellow fever, this is *primâ facie* evidence that such a case was not yellow fever, and that all such acclimated cases, seven in number, that occurred at Calvert, come under the head of hemorrhagic cases of remittent fever, instead of sporadic or endemic yellow fever; for whoever denies the perfect immunity from a second attack of yellow fever, acquired by having passed through the ordeal of one attack (so long as he remains in a Southern climate), can have had no practical experience in the nature and operation of the disease.

Let us again refer to Dr. La Roche:—

"In tropical regions," says he, "where the temperature varies but little in different seasons of the year, and in such of our Southern cities where the winters are mild and of short duration, and followed by long hot summers, this permanence exists to the degree required; hence individuals become secure against the disease."

Exceptions have been urged against this rule in the occurrence of second attacks, and such exceptions only confirm the rule, and are easily explained. Complete immunity is lost by a residence in high latitudes, and in a cold climate; it is not acquired by having had an attack of yellow fever in Baltimore or Philadelphia, where the winters are long and cold. But in New Orleans, where the best opportunities were offered to study the nature of the disease, I am not aware that a single example of the kind has ever occurred. For forty years I have never seen or heard of a well-attested case. To satisfy myself still further, I have often asked the old physicians, and, among others, the late Dr. Warren Stone, who had greater opportunities than I have ever had, and not long before his demise, whether he had ever seen a case of a second attack in the same individual who had always lived in the South? The Doctor replied: "That some of these Frenchmen have found them on the dead body, but I have never seen one, or heard any doctor, whom I could believe, say that he had ever met with one." And yet in this disease now under discussion, many persons who had been acclimated by an attack of true yellow fever, where it had prevailed endemically, and had remained in the climate ever since, took the fever in Calvert, and had black vomit, confirmed by the following copy of a telegram, dated Calvert, October 21st, 1873:—

"This fever is attacking all, regardless of having had the yellow fever before."

Now, this circumstance, coupled with the fact that every case in its first stage

bore the symptoms of malarial fever—the disease *par excellence*—and that in the mild cases these symptoms were clearly marked until recovery took place, it would be to ignore our nosology to admit that the malignant cases which terminated in hemorrhages had any claim to be classed with true yellow fever, merely on the occurrence of black vomit.

E. PALMER.

TREATMENT OF YELLOW FEVER.

The few remarks which I propose to make on yellow fever shall have no reference to the controverted points of the pathology and history of this disease. The most I aspire to on the present occasion is to present a few clinical facts, open to the observation of every careful practitioner of medicine.

As is well known, nearly every epidemic of yellow fever has, to some extent, its own peculiarities. These are caused by influences which at present are unknown to us. Notwithstanding, in order to the welfare of our patients, we must enter into an analysis of each particular case, and meet the respective indications presented. In short, we must treat yellow fever on general principles, without reference to its name. It has been my fortune to contend with numbers of epidemics ever since 1839, and I do say, in all seriousness, that so far as drawing my indications for treatment from the writings and observations of others, the effect of their teachings has been more to confuse me and lead me into uncertainty, than otherwise. If the physician at the bedside can realizingly feel assured that the so-called yellow fever is a disease of limited duration, and that the patient will recover in the great majority of cases, if let alone, I am sure the herculean treatment and marvelous cures, of which we hear so much, will become less frequent. The more I see and read of yellow fever, the more fully am I convinced that it is not cured as ordinarily understood, and without wishing to speak disparagingly of the medical profession, I hazard nothing in saying that they do more harm in the treatment of it than good.

One would lead us to believe that blood-letting is all-important, and another that opium, quinine and calomel will work wonders in this disease. I know a physician who stood preëminently high in Texas, and especially in the city of Galveston, who based his treatment mainly upon Dover's powders, blue-mass and quinine, and if a patient did not recover under this treatment, it was regarded as being incurable.

My lamented friend, Dr. Fenner, of New Orleans, was confident that he had found the remedy for yellow fever; that his chlorine mixture and the tincture of veratrum viride would cure it. I need not say how fallacious such conclusions were. I might go on to enumerate many more cases similar to those above, were it necessary. Permit me, then, to call your attention briefly to the respective conditions, and the indications of treatment. I propose to divide an attack of yellow fever into three stages:—

First, the stage of depression. This may amount to a chill or ague, which may continue from one hour to several. I wish it understood that I embrace within the stage of depression all of that period from the initial point of the disease until reaction is fully established. During this period mild emetics may be used with much propriety; salt and mustard and warm water answer the purpose very well. A very common but excellent remedy is the warm infusion of eupatorium perfoliatum. These or other similar remedies should be used promptly and freely until the stomach is thoroughly evacuated. So soon as this object has been obtained, and the

patient measurably reacted from the depression, warm, stimulating enemata should be used freely. Castor oil and oil of turpentine in soapsuds answer the purpose very well; so does warm infusion of senna or of aloes. In short, the bowels, without any further disturbance to the stomach, should be thoroughly evacuated by the time reaction is fully established. During the stage of depression, warm baths may be used to great advantage; mustard is preferred, but I feel confident that cayenne pepper is far superior. The patient ordinarily is clamorous for water. I know of no drink that is more grateful to the patient, and that is attended with better effects, than warm orange leaf tea given often in small quantities. These warm drinks and occasional baths may be used until reaction is fully established and free perspiration induced. At the risk of tautology, I will say again that reaction should be fully established, even to the ends of the fingers and toes. I cannot too earnestly impress upon the profession the importance of faithfully carrying out this injunction. There is nothing to me more important than to marshal every power of the whole organism in unison, if possible, to the conflict. Often I have found patients who had seemingly reacted well from the stage of depression, the temperature of whose bodies ranged probably as high as 105° to 106° Fahrenheit, but the tips of whose fingers and toes were still, peradventure, cool. This ought not to be so, for in this state the hands and feet are mostly dry, whilst the head and body may be drenched with perspiration.

Secondly, stage of full reaction. So soon as this has been fully attained, hot or warm drinks should be discontinued. If the thirst be great, small lumps of ice may be given every fifteen minutes. A few tablespoonfuls of iced lemonade may be alternated with the lumps of ice. In order to maintain an equalization of temperature, and a proper distribution of the circulating fluids, I have found the following lotion to act admirably, to wit:—

℞.	Aqua ammonia,		℥iv	
	Chloride of sodium,		℥ss	
	Tincture of camphor,		℥ij	
	Aqua,	q. s.	Oij.	M.

The palms of hands and wrists, and soles of the feet and ankles, the back of the neck and brow, and the small of the back, over the region of the kidneys, should be kept under the influence of this lotion constantly, during the state of high febrile excitement. A very convenient mode of making those applications is as follows:—A bandage of soft cotton goods may be passed around the wrists and ankles, extending from thence to the hands and feet, so as to secure pledgets to the palms of the hands and soles of the feet, and also four or five thicknesses of soft cotton goods should be applied over the region of the kidneys and liver and stomach. Over the two latter oil silk may be, with propriety, laid. These should be constantly saturated with the lotion. I do not think I am mistaken in recommending the following lotion in cases where there is the most remote probability of the existence of any miasmatic element in the disease. I have used it in hundreds of cases, with, to me, seeming benefit, and this I can say, that it is at least promotive of the patient's comfort. It is made as follows:—

℞.	Quinine,	℥j	
	Alcohol,	℥viij	
	Tincture of camphor,	℥j	
	Aqua,	℥vij	
	Nitric acid,	℥ss.	M.

Saturate a piece of soft cotton goods sufficiently large to cover the epigastric region and liver, and over this lay oil silk. The lotion should be re-applied every three or four hours. The temperature of the patient should not be permitted to run above 103° or 104° Fahrenheit. Ordinarily the temperature may be kept within this range by means of the above-named fomentations, and the evaporation consequent upon uniform perspiration, and a covering of simply one blanket. Many patients are sweated to death by means of hot baths, hot teas, hot bottles, bricks and heavy blankets. This is very unfortunate. Sheets should be dispensed with entirely. The patient should lie between two blankets, and simply gentle, uniform perspiration, or rather a velvety condition of the skin, should be maintained all the time until the patient is entirely free of fever. Great stress is placed by the authorities upon nausea and vomiting in this disease. According to my observation, this condition is more due to the treatment than the disease, and will not occur in one case out of a hundred if the above injunctions are faithfully carried into execution. Violent headache and delirium are also represented as a common feature. Such is equally true in reference to those conditions. Should they obtain, they should be treated upon general principles, and perhaps nothing would fill the indications better than scarified cups to the pit of the stomach, and leeches to the temples and behind the ears. Violent muscular pains often prevail during this stage of the disease. Not only so, a delirium of the muscular system, unattended with pain, often exists during this and the declining stage of the disease. The patients cannot lie still. They will turn, and twist, and place themselves in every attitude consistent with recumbency. They will beg to get up, if but for one moment. They are *so* tired, they want to rest. Sleep is entirely banished. How often, under the circumstances, is the practitioner tempted to give the patient an opiate? If graves could but speak, and tell of the untimely deaths resulting from such treatment, the medical world would stand aghast at the revelation. It has been my purpose all along to insist upon an equalization of the forces of life, and in the condition last alluded to it has seemed to me the inequality, as respects the capacity of the vascular system, is mainly instrumental in the production of the above state. The nerve centres, under such circumstances, are in a state of hyperæmia, due to congestion. Such being my inference, instead of using opiates, the effect of which is to intensify the condition, impair secretion, and finally ultimate in almost stasis of the capillary circulation, my object has been to stimulate the surface of the body, and by reflex irritation secure and maintain the tone of the circulatory system.

Again and again have I found the patients suffering either with severe muscular pains, or that still more terrible state of unrest, and have had the gratification of seeing them relieved in fifteen minutes, simply with the active friction of the tincture of cayenne pepper. There is but one objection to this remedy, that is the suffering the nurses experience from the burning of their hands. The remedy which calms and soothes the patient often renders the nurse furious with pain.

I feel that I am already making this paper too extensive, and hence will draw my remarks to a conclusion as soon as possible. I will conclude with a few remarks on the—

Third, or the stage of declension. I feel duly impressed with the great importance of speaking clearly, and to the point, if possible, in my remarks on this stage. How are we to know that the patient is entering on the third stage? The declension of the fever alone does not indicate this, but the comparative ease of the patient, the decline of the fever, the abatement of thirst, and the disrelish of acids, will, as a

rule, guide us with a great deal of certainty as to the stage of the disease. Lemonade or acids by-and-by become distasteful when given alone, but the addition of good spirits will be acceptable, and may be allowed in small quantities. By-and-by some desire is expressed for food. Whenever this occurs we may know that the state of acid elimination has set in. Acids, even when qualified with spirits, are not acceptable. The patient then must have food or die, and nothing has ever served my purposes so well as equal parts of milk and lime water, given from a dessert or tablespoon every fifteen to thirty minutes. As the quantities are increased, the interval should be lengthened. In the meantime, a few drops of good spirits may be given, as the flagging powers of life seem to indicate the necessity. The return to meat, or amylaceous food, should be made very carefully. The alternation from milk and lime water to beef or chicken tea may be advantageously employed as the patient approaches convalescence, but this must be done very carefully, in respect both to time and to quantity. I might amplify this paper and extend it unnecessarily, but such was not my purpose when I took my seat. On the contrary, it has been my desire, simply, and as forcibly as I can, to dwell clinically on the most salient points of this disease.

In conclusion, I will remark, during the second stage of the disease I give no medicine at all, if it can be possibly avoided. Some purge, use sedatives, mercury, etc., but I condemn such treatment. In the stage of declension, after the patient has returned to a fair allowance of food, a mild laxative may be necessary. The state of sleeplessness during this stage often continues for days. Opiates may be used, but with the greatest care. To the uninitiated it is a matter of astonishment how very susceptible the patients are to opiates. The following may be used:—

℞.	Morphia,	gr.j	
	Bicarb. soda,	ʒss	
	Orange flower water,	ʒj	
	Water,	ʒiij.	M.

Sig.—One teaspoonful may be given every hour until the patient is composed.

T. J. Heard, M. D.

A HISTORICAL AND CLINICAL SKETCH.

An experience, more than ordinarily extensive, in the treatment of disease generally, and *yellow fever in Texas* particularly, warrants the writer in submitting to the State Medical Association the following *resumé*.

It is scarcely necessary to premise the statement that his views on the subject are perhaps peculiar to himself, both as regards the origin and nature of the disease, but as it is his object rather to submit matter of practical value to the profession, than to court controversy, he may be excused from stating his views on these points.

With respect to the contagious or infectious character of the disease, however, much that he has to say is pertinent, and it may be as well to announce at once his conviction that it is generally of local origin, and although portable, never spreads unless food in abundance is supplied to support its germs. The arguments in favor of this proposition will be found throughout this sketch, and are submitted without special effort to show their application.

First, we will take Vera Cruz and Tampico as examples, during the war between the United States and Mexico, in 1846–7.

The disease was prevailing in both of those cities, while New Orleans was entirely exempt, notwithstanding free intercommunication was had, without the intervention of quarantine or other restrictions.

I yet retain a very vivid remembrance of the fact that about the middle of June, in 1847, the Alabama regiment of volunteers, to which I was an attaché, sailed from Vera Cruz for New Orleans, after the fever (vomito) had been prevailing in an epidemic form for near two months.

We were becalmed on our voyage, and were near ten days making the trip; but on our arrival at the Balize we found the towboat in waiting, which towed us up to the city at once.

Previous arrangements having been made for our reception, we were sent by companies to the hotels and private boarding houses, with no restrictions whatever placed over us. We were also permitted to take with us our clothing, blankets, etc., yet not a single case of yellow fever was known to occur in New Orleans that year, though it developed itself in some of our men after reaching the city. I could give quite a number of similar instances, but one other will suffice.

During its prevalence in New Orleans in 1853, and while raging in its most malignant and fatal form, I received a communication from the Hon. Benj. Rush Gantt, stating that three hundred deaths had been reported that day, that he had determined on leaving there the next day for Opelousas, and that he had never thought of running from it before; but then, for the first time in his knowledge, it was attacking the oldest creoles as well as the blackest of negroes, and none seemed to be exempt save those who had once had it. At the same time it was prevailing to an alarming extent along the whole length of the Gulf coast of the Lone Star State, as also in the great railroad centre and bayou city, Houston.

I was at that time located at Chappell Hill, Washington county, Texas, about sixty miles north of west of the former city, and had three years' experience in the treatment of Texas diseases. The latter place, though surrounded on the north by New Year's creek, east by the Brazos river, and south by Caney creek, and located in the centre of one of the richest cotton-growing districts in the State, had always been considered a moderately healthy place until the previous year (1852), which proved to be the most unhealthy ever known in that locality and throughout the State.

Our only mode of travel in those days was on horses, or rather mustang ponies, and in slow coaches; our freight was conveyed on ox-wagons.

During the prevalence of the epidemic that season the teamsters from our village and all the up country would drive their teams within four or five miles of Houston, then employ some one who had once had the fever to drive in and bring out their freight. A few would venture in themselves during the day and come out before night and escape the disease, while others, who would remain in during the night, invariably contracted the fever, four of whom were brought to my town; three died, one recovered, and one died before reaching the place.

During the treatment of three of these cases the citizens had free access to their bed chambers, and would come for miles to see them; it was almost impossible to keep them away from the sick.

During all this time—it being the latter part of summer and the beginning of fall—the merchants were receiving large consignments of woolen goods, blankets,

etc., and, strange as it may appear to some of you gentlemen, not a single citizen who handled the goods, or nursed the sick, had the disease, nor even thought or dreamed of any danger.

And again, in 1859, when it was prevailing in its most malignant epidemic form in Hempstead, a small village on the Central railroad, only ten miles east of Chappell Hill, I treated one case in the latter place who had been living in Hempstead, and contracted the disease there. This case was visited by a number of citizens during the treatment, all escaping the disease.

But in 1867, with all their quarantine regulations, overlooking the importance of hygienic measures—the only safeguard against the fever—it prevailed to an alarming extent, and was quite as fatal in Chappell Hill as it was in any other place in the State, one-half of the sick dying.

I have never known to my own satisfaction a single instance where quarantine ever prevented the prevalence and spread of yellow fever; but, on the contrary, I have known it to do great injury, by crippling commerce, alarming the sick, and depriving them of the actual necessaries of life.

It has been, and may be kept out of cities by rigid sanitary laws, strictly enforced, and not otherwise.

Take for example New Orleans during General Butler's reign. Bad as that was otherwise, he had the city so thoroughly cleansed that he succeeded in preventing the propagation and spread of the fever.

When a disease is known to be self-propagating, and after the poison is once planted in productive soil, to travel in the air, as does yellow fever, there is just about as much wisdom in a man building a perpendicular stone wall, twenty feet high, around his garden, to keep out the dews of heaven, as to place a few armed men around a city to repel yellow fever. This causes an imaginary security, which becomes fatal by promoting the neglect of proper sanitary measures, while the enemy is lurking within the lines.

Mr. President and gentlemen of the Texas Medical Association! I am ashamed of the fact, yet duty compels me to affirm it, that medical men placed in charge of quarantine regulations are too often timid and inexperienced men, who, while they are engaged in writing and issuing their orders with one hand, are with the other packing their trunks and getting ready to leave the threatened locality, frightened out of their wits, and incapable of explaining to you the difference between the effects of quarantine and those of sanitary preventives. Again, nine-tenths of medical men who advocate quarantine regulations have never passed through an epidemic of yellow fever, and have no real practical knowledge of the disease, but simply take for facts the mere assertions of other badly frightened persons, without a shadow of proof, or even a plausible reason for doing so. And I do think that, when medical men unite their voice and influence with those of inexperienced and timid officials, in establishing quarantine, which renders only imaginary protection, but cripples commerce, interrupts travel, deprives the sick of the actual necessaries and comforts of life, they commit an error, the consequences of which are beyond estimation, and one that elicits the united protest of all rational minds. But that such facts have too often come under my own observation, and that such members of our profession become anti-philanthropists, and should be so viewed by all the sober, reflecting and intelligent portion of the medical profession, is beyond the question of a doubt.

In further proof of my position, I will only refer you to two cities of great resort from yellow fever districts. The first is Jalapa, in Mexico.

During the prevalence of the vomito in the city of Vera Cruz, every person who is unacclimated, and is able to leave, spends his or her summers in this city, an inland place, sixty miles west of Vera Cruz.

It is often the case that numbers of those who are late in getting off will have the fever developed in them after reaching Jalapa, yet not a single case has ever been known to spread from the sick, or their baggage.

The next is Biloxi, Mississippi, situated on the bay of the same name, and is a noted place of retreat for unacclimated citizens of Mobile and New Orleans, and up to the time it became epidemic there, no one ever thought of taking it, or of its spreading.

I could mention a number of other places and instances, but these must suffice.

I will state, however, that both of these places were free to all visitors and their baggage, who came from infected districts, and no one ever thought of quarantining them, or of contracting the disease.

"Up to the year 1793, a majority of American physicians were believers in the contagiousness of yellow fever, but during the epidemics occurring between that date and 1825, the practical experience so changed the minds of the medical world, that, while five hundred and sixty-seven were against the doctrine of contagion, twenty-eight only remained in favor of it."

And he who favors that doctrine in this age of progress and enlightenment, would give us proof positive of the great progress he had attained in a reversed knowledge of medical literature.

As to its local propagation, I have to say that in the epidemic at Hempstead, in 1859, and in Brenham, in 1867, there were the strongest evidences that the fever originated in both of those places. I was summoned to visit the first cases that occurred in the former place, and on my arrival one had just died with black vomit. He came there from Houston about four weeks previously, and that before the fever had made its appearance in said city, and he could not have brought the disease with him. Two others were citizens of the place, and had not been in any other infected district.

Previous to my arrival, there had been a general stampede, and I advised the few who remained to instruct those who had fled to remain away until there came a killing frost; but to my great astonishment and horror, in a week from that time I came across a Hempstead paper, in which was a leader inviting everybody to return, stating that those who had the disease brought it from Houston; that there had been no new cases, and that it would be perfectly safe to return to their homes. They did so, and the result was that in ten days nearly every one was taken down with the fever, and had to send to Houston for nurses. There were not well people enough in the place to nurse the sick and bury the dead. The place being quarantined, it was impossible to procure the real necessaries and comforts of life, which is always the case under such circumstances in small villages, and consequently great suffering; and in this instance one-half of those who were afflicted died.

Brenham, in 1867, had the same proof of its origin, with similar suffering and mortality; and it is invariably so with small cities and villages, when quarantined. The place becomes isolated, the country people are too much frightened to come in, or send in supplies, and all public modes of travel and transportation are stopped; hence the cause of such great suffering and so many deaths.

"The time has arrived, or must very soon come, when cities must look to themselves for the cause of yellow fever, and not to distant places, and to the scavenger and health officer, rather than to quarantine, for exemption. It is not a foreign invader, but a domestic enemy."

SYMPTOMS AND TREATMENT.

First, symptoms. The first thing to be accomplished, when you are summoned to visit a case, is to satisfy yourself that you have a case of yellow fever under your charge. And as there have been so many more scientific and experienced writers than myself, who have so fully elucidated the symptoms of this great scourge, it would be presumption in me to enter into an elaborate detail of this part of my subject.

As soon as you have made out your diagnosis correctly, the next thing to be done is to give a warm mustard pediluvium, then place your patient comfortably in bed, give him a cup of warm orange-leaf tea (or sage tea), with a teaspoonful of the essence of orange in it. In two hours after, give two tablespoonfuls of castor, or what is better, three of olive oil.

If the patient is bilious, and has an old torpid liver (as is often the case in Texas), after the tea I give the following:—

℞. Podophyllin,
Calomel,
Camphorated Dover's powders, āā. gr.iv. M.
Sig.—Make into three powders; give one every three hours; the oil then to be given, if necessary, three hours after the third powder has been taken.

If the bowels should move too freely, give a drachm of camphorated tincture of opium; repeat the oil every second day, and the latter according to the circumstances of the case.

During the pyrexiæ, which usually continue from three to four days, I use the following mixture as a diuretic, diaphoretic, sedative and febrifuge:—

℞. Fluid extract valerian,
Tincture gelseminum (yellow jessamine),
Tincture cubebs,
Sweet spirits nitre, āā. ℥j
Sulphate morphine, gr.iv
Oil sassafras, ℥ss. M.
Sig.—Give a teaspoonful every six hours, in warm sage or orange-leaf tea.

This is only to be used during the febrile state; after which I give:—

℞. Sulphate of quinine, gr.iij
Sulphate morphine, gr. ⅛. M.
Sig.—Three times a day, in conjunction with old port wine, porter, ale, beef tea, etc., as a tonic.

After the patient has taken his first draft of tea and pediluvium, and been in bed one hour, if diaphoresis does not set in, I then immerse the entire body in a warm mustard bath; rub the body and extremities dry; replace him in bed and repeat the tea. During the bathing, and especially while getting off and on the bed, the greatest care should be taken to exclude the cold air, to prevent chilling him. While in bed, with plenty of good warm cover, fresh air must be admitted into the room, but not so as to blow on the patient.

Good nursing, excluding the cold air, by having a requisite amount of good, warm

bedding; keeping up a mild determination to the surface (diaphoresis) by warm teas; regulating the bowels with oil; supporting the system by liquid nourishments, tonics, etc., constitute the sheet anchor of success in the treatment.

I also use cold mucilaginous drinks in place of water, always to be given immediately after the warm tea.

During the febrile excitement, if the body becomes dry, the patient will become very restless, and it is often the case that it is with great difficulty he can be kept on the bed.

I then have the body and extremities freely sponged with equal parts of dilute acetic acid and alcohol (good vinegar and brandy will answer). In five or ten minutes the patient will quiet down and drop off into a sound, sweet, refreshing sleep, and remain quiet for several hours. This must be done by placing the hand under the cover, so as to exclude the air. But all our skill will sometimes fail us, unless aided by Deity, and good experienced nurses, who should be vigilant night and day.

Give me cases in midsummer, and two good nurses to each case, and I will obligate to cure nine out of ten; but with inexperienced and careless nurses, and cases such as we often have in Texas late in the fall, after the northers set in, and in open rooms, you might safely reckon your loss nine out of ten, or one-half at least.

In close rooms, with good fireplaces, and a plenty of good fuel, and a thermometer well watched, thereby regulating the temperature, you may treat cases successfully in winter. Watch your cases closely for ten days, and never let them leave their rooms under fifteen days, keeping them strictly dieted the whole time.

If black vomit should occur, give

℞ Tincture sanguinaria, ℥j
Creosote, gtts.x
Syrup stilingia, ℥ij
Essence of peppermint, ℥j
Sulphate morphine, grs.ij. M.

Sig —Give a teaspoonful three times a day.

Or,

℞ Nitrate of silver,
Gum opium, āā. gr.xij. M.

Sig.—Make into twelve pills; give one three times a day; alternate, so as to give the medicine three hours apart, keeping up the free use of the mucilaginous drinks.

J. F. Matchett, M. D.

THE EPIDEMIC OF 1873, IN COLUMBUS, TEXAS.

The occurrence of various epidemics in different parts of the State during the latter part of last year; their extreme virulence, and the great death-rate that marked their progress; the obscurity of their origin, and the conflict of opinion among medical men as to their intrinsic character, furnish important material for the consideration of the profession. The prevalence, simultaneously, of like epidemics in some of our sister States should likewise engage our attention; and if, upon comparison, we find a sufficient coincidence of circumstances, we may possibly obtain the clue to their causes, and thus enable ourselves to ward them off in future, or arrest their progress in case of their development. To promote this object is my

purpose in the present paper, and to that end I propose to submit, briefly as possible, a history of the epidemic as it occurred in Columbus, during the months of October, November and December—the term of its endurance—interspersed with such facts and clinical observations as may seem conducive to a just appreciation of its character.

Before I proceed, however, it is proper to note the fact, that while Marshall, Denison, Calvert and Columbus, *all inland*, suffered severely, our coast towns and cities —many of which have hitherto been considered the home of epidemics, and, in some instances, hot-beds for the generation of pestilence—have not only escaped, but have been sufficiently exempt from disease of every description to make them places of resort for safety by refugees from the inland pestilence. The fact is startling, and affords material for the most careful consideration, the most thorough investigation our profession can give it. Shreveport and Memphis, it is true, had a fresh-water connection with the coast, through New Orleans, where yellow fever prevailed, but, from all the information I have been able to obtain, to a very limited extent, and within circumscribed boundaries; while in the former places the disease spread with unprecedented rapidity, and was marked by a most appalling mortality.

Columbus, with a population of about three thousand inhabitants, is situated on the west bank of the Colorado river, at a point where that stream, sweeping around a bend some fourteen miles in length, approaches the eastern limit of the town from the northeast, and then veers off in a southeasterly and easterly direction. The bend comprises something more than three-fourths of a circle, which is completed by a strip of low land, or a sort of slough, which connects the river from above with Ratcliff's creek, which empties into it a mile below the bend; thus surrounding us with a belt of low, marshy land. The low land on the eastern side of the river, where it approaches the town nearest, is about half a mile in width, and tolerably thickly set with timber and the ordinary undergrowth common to unreclaimed river lands. The actual site of the town, however, may be termed high, sandy bottom land, with occasional "dips" or small basins distributed over it, but which dry readily after ordinary rains. The entire town is admirably located for cheap drainage, but no such precautionary measure has yet been adopted.

Isothermally, Columbus is nearly on a line with Alexandria, Gibraltar, Pensacola, Mobile and New Orleans, and has an elevation above the level of the sea of from ninety to one hundred feet. Perhaps one-third of the town is subject to overflow on rare occasions—every fifteen or twenty years. An extreme overflow of this description occurred in 1869, and another in 1870,* the first in July, and the second in September; but neither one of them was succeeded by any material increase of sickness in town or in the country. The lower lands contiguous to the river are overflowed, more or less, every year, particularly during the summer and fall months.

Notwithstanding these surroundings, Columbus, and indeed the country in its vicinity for miles around, near the river and on the hills, has hitherto been exceptionally healthful, until about the 1st of July last, when the manifestations occurred which culminated in an epidemic, which, although trifling compared with others, was still so fearful in contrast with all the former experience of our people, that they were at once panic-stricken and utterly demoralized.

Of the meteorology of Columbus, it is to be regretted that accurate observations

* Old citizens say these overflows almost invariably occur two years together, the last one before this having occurred in 1853 and 1854, the predecessor of that in 1832 and 1833.

were not made and recorded, as without them I can only state, generally and indefinitely, that the rainfall was greater probably than on any previous occasion, and the summer heat was protracted far into the fall season; the winds, instead of the pleasant, bracing Gulf breeze to which we are accustomed during our summers, prevailing mostly from the northeast, east or southeast. For a month or two prior to the outbreak of the epidemic a peculiar but very offensive, or, as some expressed it, "sickening" exhalation from the small basins in different parts of the town was very manifest during the night, though scarcely perceptible through the day.

The low lands near the river were overflowed on four or five different occasions between the months of April and November. One of these overflows, occurring about the 25th of August, was remarkable for the enormous quantity of *dead fish* floated down the stream. The column was scarcely broken during a period of two days and nights, and the current being strong, the quantity passed is altogether beyond estimation. Occasionally, they were floated away from the main current, and lodged in the drift-wood of the overflowed low land, where, covered with a thin coating of sediment from the muddy flood, vast quantities of them were left to swelter and decay. The source from whence they came, and the cause of their death, are questions that up to the present time have defied scrutiny.

The recession of this overflow was not attended with any palpable increase of sickness, citizens of the town being more than usually healthful.

But to return, for a moment, to an earlier period in our history. The health of the country for miles around, particularly near the river, was much worse than usual. During the months of June, July and August,* intermittent, remittent and bilious fevers prevailed, with nothing unusual to mark their course; but in the latter part of August and first of September there was a manifest change in the type of the disease. Patients were attacked with a chill, as usual, but in a great many cases the intermission or remission was nearly, if not entirely, absent; the heat of the surface was peculiarly pungent; the tongue large, clean and intensely red; the eyes glassy; pulse small, hard and quick; stomach irritable, with some tenderness, extending obscurely into the bowels. The fever rarely abated before the twelfth day, and the intolerance of quinine in any of its stages was universal in my experience. In some few instances the fever disappeared on the fifth day. Cases of this general character were mostly confined to river plantations above and below town, though some few were met with on plantations in the vicinity of Skull creek, a small stream of considerable length and swampy bottoms, from seven to twenty miles west and south of town. In two or three cases that came under my observation there was a marked hemorrhagic tendency; and one that I remember was attacked on the evening of the 26th of August with a severe and protracted chill, succeeded by fever; small, quick, hard pulse; half comatose. In twelve hours was a deep bronze color, and voiding bloody urine by the gallon. 27th, no abatement of fever. Medicine operating freely; stools of dark grumous material; stomach irritable, and stupor deep as ever. Gave a saline purgative, with directions to follow its action with full doses of quinine. 28th, fever seems to be subsiding; stupor not so deep; pulse softer and slower; bowels have been moved freely, the evacuations consisting of large quantities of material similar to the first passed;

* The winds during this period prevailed from the south almost exclusively, thus sweeping whatever of malarial or other poison might have been developed along the river away from town, while river plantations were still more or less exposed to it.

has ceased to void bloody urine, but is retching and vomiting a little matter similar in appearance to his stools. Directed brandy in milk punch.

The patient died with black vomit 48 hours after the attack.

Another case that I was called to see on the 16th of September, on Hervey's creek, nine miles west of town, terminated in an inveterate attack of *purpura hemorrhagica*, that resisted every remedy, until I put him on bromide of potassium and ergot. The amount of blood he lost from the nose, mouth, throat, urinary organs and bowels was incredible. But little escaped through the skin. The patient lingered until the middle of November before he was fairly convalescent.

These cases involved deviations from the ordinary course of the class of cases under consideration, but only in the respects indicated.

Prior to this time the town had been remarkably healthy; and no case of the peculiar type of disease which had been ravishing the county had occurred within its limits; but the extraordinary rainfall and protracted heat, combined with an intolerably bad sanitary condition, were beginning to manifest their power, and on the 16th of September I was called to the first case of this peculiar type of disease within the corporation. Four members of the family were attacked in succession, and each case proved more obstinate than its predecessor. In the fourth case I was induced, contrary to my judgment, to repeat the ordinary purgative on the fifth day. On the sixth, he had black vomit, but eventually recovered, though with feeble health and a severe jaundice for several weeks after. This case occurred in the extreme western limit of the town, but in close proximity to the slough before mentioned.

The next case of great gravity that I saw was a young man, who, for six weeks or two months preceding, had been gathering pecans near the river, but some twenty miles below town. He came into town on the evening of the 25th, feeling quite ill, and considerably jaundiced, but free from fever. About ten o'clock at night had a severe chill, followed by fever attended with delirium. I was called on the morning of the 26th, and found the patient still suffering from fever; pulse 120; tongue large and red; eyes red and suffused; urine scanty and of a reddish yellow color; tender over the region of the stomach and bowels, and manifesting a considerable amount of nervous anxiety. Prescribed an active cathartic, to be followed by spirits nitre and aconite until his fever abated, when quinine was to be exhibited in full doses. The purgative operated finely, but the fever continued without mitigation. His stomach becoming irritated, and his kidneys still acting sluggishly, I directed turpentine emulsion and spts. nitre, and an embrocation of oleum terebinth. over the stomach and bowels; saw him again in the evening; skin hot, but soft and moist; pulse 108; kidneys acting more freely. 28th. Patient had a restless night; otherwise no change. Discontinued the terebinth. emulsion, and ordered,

R.	Potassa acetat,	ʒij	
	Potassa citras,	ʒj	
	Morphia,	gr.ij	
	Aqua,	f.ʒiv.	M.

Sig.—A teaspoonful every three or four hours.

In the evening, his fever had declined considerably, and he was, to a great extent, free from the nervous anxiety or trepidation that had previously been a troublesome feature in the case. Bowels had not been moved, and he was somewhat clamorous on that subject; continued same treatment, however, through the night.

29th, 9 o'clock A. M.—Medicine has acted well, patient apparently recovering rapidly; ordered quinine. At 12 o'clock I was sent for in great haste, my patient having in the interim grown greatly worse. Found him with a full, strong pulse, 54 (?) to the minute; skin soft and moist, but with a warm, uneasy sensation in the region of the stomach, and occasional fits of vomiting, in which he threw up copiously of a dark, grumous-looking material, which soon separated, the black granular matter sinking to the bottom, and leaving a semi-transparent, yellowish fluid on top, which showed acid reaction. Discontinued quinine, and directed a mustard sinapism over the stomach, and internally the following mixture:—

R.	Magnesia,	℥j	
	Aqua,	f.℥iv	
	Spirits of ammon. aromat.,	f.℥ij.	M.

Sig.—A tablespoonful, to be repeated in two hours, and after that at intervals of four hours.

Patient continued to vomit occasionally throughout the balance of the afternoon, but his pulse increased to 60, and the uneasy sensation about the stomach was less troublesome. Treatment continued.

31st. Patient apparently better; had ceased to vomit during the night, and got some sleep. Pulse 45 to the minute.

The patient continued to improve as rapidly as cases of such severity generally do, but the attack has left him with an intermittent pulse, and subject to severe fits of palpitation, from which it is probable he will never recover.

I give the details of this case more fully than I should otherwise have done, on account of its bearing upon the question of the origin of the disease, in connection with which I shall refer to it hereafter.*

On the 2d day of October we were visited with another, and the last partial overflow of the season. The weather was hot and sultry, and, although there were no *dead fish* to be seen in the turbid current, the stench from it was intolerably nauseating; the odor of decaying fish and rotting weeds combined. Occasionally the skeleton of a fish, with fragments of flesh in an advanced state of decomposition, might be seen floating just beneath the surface. Other carcases were also floating down the muddy torrent in abundance, some in advanced states of decomposition, and others but recently dead.

About this time a death occurred in a boarding house on the south side of the public square, which Dr. Bowers said resembled yellow fever very much. The subject, a Swede, who knew scarcely any English, was at first supposed to have come from Shreveport, but upon careful investigation it was found that if he had ever been to Shreveport at all, it was at least several weeks before his arrival here; and if he had yellow fever, he had also several other things that are not good to have, of which it is sufficient to mention an enlarged and indurated spleen; and, very probably, tertiary syphilis. My late lamented partner, Dr. B. B. Palmer, saw him and prescribed for him some two or three weeks before his death, and is my authority for this statement. After Dr. Palmer's prescription in the case, the subject of it went about thirty miles west, to work as a common laborer on the Galveston, Harrisburg and San Antonio railroad, where he continued to grow worse, until the day

* This case was treated at the residence of Mrs. P., who had lost a son a few weeks before, with a disease somewhat similar. His death was preceded some twenty-four hours by a total suppression of urine. The attending physician considered it a case of hæmaturia miasmatica.

before his decease, when he returned to town to die, and furnish matter to feed quarantine discussion.

The condition of affairs now was well calculated to excite the most alarming apprehensions in all reflecting minds. Surrounded by a flood of filthy, stinking water, the streets and vacant lots of the town covered with a rank growth of matured weeds, which were falling down and rotting rapidly under the influence of repeated rains, and a high temperature; numbers of carcases of dead hogs, dogs, etc., decaying in various parts of the town; privies unpoliced; and, to aggravate this multitude of evils, a city government that, whenever it was addressed upon the subject of a sanitary police, insisted upon establishing *quarantine* against some place that it imagined had yellow fever; and, as if intent to precipitate us into an epidemic, at this junction this said government passed an ordinance requiring the hogs to be removed from our streets, thus depriving us of our only scavengers, and leaving the offal from our kitchens to add its noisome effluvia to the mass already on hand.

The result is not difficult to imagine. While our city government continued, from time to time, to adopt quarantine ordinances, the health of the town grew gradually worse; the number of cases increased, and the attacks were more violent, frequently terminating on the seventh or ninth day, but generally in convalescence.

The treatment which I found most effective was only slightly modified from that adopted in the earlier cases, and consisted of a thorough purgative of either rhubarb and bicarb. potass., or, if the patient was at all plethoric, a saline,

℞. Magnesia sulph., ℥iss
Pulv. doveri, gr. xv. M.

Sig.—Divide in pulveres iij. One every four hours until the bowels are thoroughly evacuated.

with three to five grains Dover's powder. The action of the cathartic to be followed by the turpentine emulsion,

℞. Ol. terebinth. pur., f.℥ij
Ol. sassafras, ♏xx
Mucilage of acacia,
Syrup simp., āā ℥iv. M.

Sig.—A teaspoonful every four or six hours.

or turpentine emulsion and spirits nitre. If this prescription was not tolerated by the patient, I substituted spirits nitre and tinct. of aconite; or if there was any tendency to suppression of urine, the mixture of acet. and cit. potass. before mentioned. If nausea and vomiting occurred, the magnesia mixture was generally ordered, because of the invariable presence of acid in the stomach, sometimes with a mustard poultice on the stomach and bowels, but more frequently with a wet compress, particularly if the temperature of the body was high.

As soon as the fever began to decline, the patient was liberally nourished with fresh milk and liquor calcis boiled together, if the nausea was troublesome, otherwise beef tea was preferred; and after the complete abatement of the fever, beef tea and sherry wine. Champagne was, if not detrimental, at least of no value as a therapeutic agent, since it aggravated the tormina that frequently proved troublesome in the latter stages of the disease, however it terminated. In cases of extreme prostration, beef tea and brandy were of great utility, and were always well borne.

It was always of great importance to confine the patient, during the entire period

of convalescence, to a light and easily digested diet, and Borden's extract of beef and pemican, of which the generosity of Mr. H. L. Borden gave us an ample supply, afforded both an eligible and available material for this purpose, combining convenience for immediate use with all the qualities of unirritating nourishment of beef tea prepared by the tedious process of preparation in a water bath.

On the 7th day of October the waters began to subside, and on the 8th the river was within its banks. The winds now prevailed for some weeks almost continually from the east, sweeping over the broad strip of low land so recently flooded, where thousands of carcases of dead fish, hogs, cattle and horses had been left to decay in the drift and mud, with the mercury rarely indicating a temperature below 90° Fahrenheit. Every member of the profession in the place was busy, and my labors were incessant. And although there were but few, if any, fatal cases, it was evident that the type of the disease was daily becoming more severe. There were still the large, clean, red tongue, tender stomach and bowels, ushered in with chill; but there was more remission and intermission in the febrile stage of the disease, and a greater tendency to congestion. Still quinine was not often tolerated, nor did the patients bear well the repetition of any purgative medicine until after the disappearance of the fever, when, in cases where the nausea was protracted, I sometimes gave syrup rhei aromat. alternately with the magnesia mixture, until the dark grumous matter ceased to pass from the bowels.

But yet there was no panic among our people. It was not until the 18th, on which three deaths occurred, that the cry of yellow fever was started, and our entire population so utterly demoralized. Vast numbers fled precipitately to the country; some few whose circumstances justified the expense, to Galveston and other places, where medical aid would be convenient in case they needed it. It was estimated that there were not three hundred white persons left in town, but this was evidently an error, for there were subsequently something more than a thousand cases of the disease reported. My own opinion is—and I have taken all possible care to approximate the truth—that there were from one thousand to twelve hundred whites, and probably some eight hundred negroes in town, throughout the greater part of the time that the epidemic prevailed, a large number of our negro population being absent, as usual at that season of the year, picking cotton.

On Saturday, the 18th day of October, there were three deaths in town, and the disease from which they occurred was emphatically pronounced yellow fever. Whatever it was, it unquestionably prevailed with unabated malignity, from about this period until the 31st day of December. But before we proceed with a description of its ravages, let us fix some landmarks to aid the reader in a just conception of its onset, and assist him in keeping pace with its progress.

Charter street constitutes the eastern boundary of the town, but is cut into and obliterated by the river for the space of three squares near its centre, leaving only its southern and northern extremities. Front street is entirely parallel with, and one square west of, Charter. Travis, Milam, Bowie, Live Oak, Prairie and Austin streets, are the next, in the order in which they are named, parallel with, and west of Front street, as far as they need be enumerated. Jackson street, crossing these at right angles, is as far south as any case of the epidemic occurred, and, proceeding north from it, we encounter successively Washington, Spring, Walnut, Crockett, Preston and Dewees. The boundary thus indicated, *i. e.*, from Chester street west to Austin, and from Jackson street north to Dewees, includes about two-thirds of the population of the town, and that portion of it to which the epidemic was con-

fined. As an additional aid, we may also mention that the Courthouse square is bounded on the north by Walnut, the east by Travis, the south by Spring, and the west by Milam streets. And the Galveston, Harrisburg and San Antonio railroad penetrates the town through the eastern extremity of Crockett street, diverging at the crossing of Travis to the northwest to the passenger depot on Milam, between Crockett and Preston streets, and to the freight depot and lumber yard west of Milam, and north of Preston street.

Let us now return to the three deaths which inaugurated the panic, if not the epidemic. I have not been able to obtain much reliable information with respect to the predominating symptoms in either case, but some few facts in the history of two of them deserve notice.

Mr. Sachs, laborer in a lumber yard near the freight depot, and residing on the northwest corner of Bowie and Jackson streets, of feeble health and regularly a "hard drinker," was the first of the three. He probably had chronic disease of the liver, as he had for some years been subject to attacks of jaundice, though they rarely interfered much with his daily avocation; was considered jaundiced when attacked with his last illness. This was very brief, his death occurring some eighteen or twenty hours after the initiatory chill. Vomiting large quantities of dark-colored, offensive matter before, and an intense jaundice immediately after death, were the prominent features in the case, as detailed by his widow.

The next in the succession was a young man whose place of business and lodging was at the passenger depot. He had been under treatment for gonorrhœa for five or six weeks before his decease, in the course of which he had changed his physician several times, finally placing himself in the hands of some medical wiseacre who gave him enormously large doses of *copaiba* and *bromide of potassium*. The result was an irritation of the stomach, from which he never recovered. There was no jaundice in this case.

Of the other two, I have not been able to learn anything, except that they were railroad laborers, and had come in from their work quite sick, a few days before their decease. I saw one of them half an hour before his death, at which time he had more symptoms of cholera than of yellow fever. Severe cramps alternated with vomiting and involuntary purging; extremities cold, and surface wet with perspiration, and pulse barely perceptible at the wrist, were the most obvious features of this case at that time, whatever they may have been before.

These cases occurred at a boarding house for railroad laborers of the lower class, that deserves special notice. It was an old wooden building, on the south side of the public square, that had long been used as a drinking saloon. The timbers and floor were badly decayed, which, combined with the slops and other filth incident to the dispensation of large quantities of various "drinks," for which it was a mart, made it peculiarly and extremely offensive to the nasal organs of most men. A close, high enclosure, which cut off ventilation to a great extent, also contributed to its disease-breeding properties.

The promulgation of the statement that three deaths had occurred in town from yellow fever, and that that dread disease was prevailing in an intensely epidemic form, overwhelmed the entire community with terror and confusion. All ordinary business was abruptly suspended; the shock of an earthquake could not have made a more profound impression. Then, after a momentary pause, a scene of wild disorder and terrific apprehension ensued, that defies description. No class of our people, save the negroes, seemed to be exempt from the insane fear. Of those who

were able to get away, many fled precipitately, and, in some instances, to the shame of humanity be it said, the ties of the nearest relationship were insufficient to stay their maddened flight. Some of our prominent physicians even deserted their patrons, and took refuge with the frightened mass wherever they could find it; and on Monday morning Dr. Bowers and myself were the only representatives of our profession on duty in the place.* The sick, of whom there were more than had ever before been known at one time, shrank, cowering and dismayed, as if from the doom of death, many to despair and die. Doubtless the shock of fear and terror contributed largely to the mortality.

On Sunday, the 19th, there were but two deaths, though the disease was prevailing all over that portion of the town of which I have heretofore given the boundaries. I did not see either of them, and, consequently, can give no information with respect to them, except that one was a man of about thirty-five years of age, and of very intemperate habits. This death occurred at the boarding house on the south side of the public square.

The other, a young man of excellent habits, died at his father's residence, on Front street, between Walnut and Crockett, near the railroad bridge across the Colorado river.

On Monday, the 20th, there were probably three or four deaths, but in the confusion and demoralization that prevailed throughout the community, it was impossible to obtain reliable information on the subject. One of them, a young man, the first death that occurred in my practice, deserves special notice.

The father of this young man had been attacked on the 10th of the month with, apparently, a simple bilious remittent fever; was treated with the ordinary remedies for that disease, and, although the quinine nauseated him considerably, he bore it, and was convalescent on the 16th, though severely jaundiced and voiding dark, bloody-looking urine, but not in large quantities. On the 14th, this son, who had nursed his father with zealous care, was attacked with a chill, and the usual sequential fever; was prescribed for accordingly, believing the attack to be due as much to fatigue and loss of sleep, as any other cause. On the 15th, patient was much better; had slept well and sweated his fever off during the preceding night. Gave quinine in full doses, but in the evening the chill recurred, and was succeeded by a more protracted and higher grade of fever, and considerable irritability of the stomach. Prescribed spirits nitre and tr. aconite, under the influence of which the fever abated about 10 o'clock on the morning of the 16th, leaving him with a pulse moderately full, soft, and eighty to the minute. Skin moist, but not perspiring freely. Tongue had cleaned off, and looked entirely red and raw on the edges. Thirst considerable, and some nausea, with a decided nervous, restless solicitude for his condition. Prescribed turpentine emulsion with spirits nitre, and gave him pounded ice instead of water. On the 17th the fever recurred without any perceptible chill (though his feet grew cold for half an hour before), three hours later than on the previous day, and patient had a very restless night; urine scant and very high-colored; pulse 110; but little nausea, though very tender over the region of the stomach. Prescribed the potash mixture with tinct. aconite, and applied a wet compress over the epigastrium; saw him again late in the evening; perspiring and restless; otherwise no change. On the morning of the 18th, found my

* Dr. Weller was still in town, but too ill to be of any service to the sick; as was also Dr. Palmer. Dr. Brown was detained at home with a sick family, and did not subsequently take any part in the practice.

patient with high fever; pulse 120, and a raving delirium which continued without abatement or mitigation until death closed the scene, on the morning of the 20th. His stomach was extremely irritable, and he vomited repeatedly during the day and night of the 19th, but ejected nothing resembling black vomit. The high temperature of his head, and his frequent complaint of pain in the temporal region induced me to try to cup him, but the effort was only partially successful, and wholly without benefit. Ice bags were applied, but in his delirium he would not let them remain. In an hour after death he was thoroughly jaundiced; a dark bronze over the chest and stomach.

On the 18th, from solicitude for his son, I suppose, the father relapsed, and continued to have light fevers and an intensely irritable stomach for several weeks, but eventually recovered.*

The death of this young man took place in a new tenement, on the east side of Travis street, between Washington and Spring, near the boarding house to which I have before referred.

In the meantime new cases were multiplied with great rapidity, and our limited stock of professional aid was being exhausted with proportionate speed. Various telegrams were sent to Galveston and other places, perhaps, for assistance. The citizens of Galveston responded with a noble generosity, that rarely finds a parallel, and promptly dispatched both physicians and nurses to our assistance, placing, at the same time, an ample sum of money to our credit, with which to procure such supplies as might be necessary.

Tuesday, October 21st. There were now between seventy-five and one hundred cases under treatment within and nearly equally distributed over the limits heretofore indicated, and the mortality attained its maximum, the number of deaths from all cases being six, of which one was probably from enteritis. He had been ill for several weeks, during which time he had taken oleum tiglii repeatedly; had an imperfect convalescence and a relapse before the beginning of the mortality. His death occurred at the corner of Washington and Travis streets; one on Jackson street, between Travis and Milam; one at the corner of Crockett and Travis; one at the boarding house, south side of public square; one on Crockett street, between Milam and Bowie; one at the corner of Preston and Live Oak streets, and one on Austin street, between Jackson and Washington. Of these I saw only two—the one on Crockett street, an Irish woman—moribund when I was called. The other a young German, whose place of business was on the corner of Preston and Bowie streets, adjoining a large hide house, the stench from which was very offensive; his residence was on Austin street, between Jackson and Washington.

The father of this young man was attacked on the 8th, and had fever continuously until the 12th, when it abated, and he appeared to be convalescing well. His bowels had not been moved since the 9th, and I ordered a mild purgative at bedtime, which acted twice copiously in the morning of the 13th, and was succeeded by a return of fever with irritable stomach, which did not yield until the 16th. No vomiting nor jaundice. The son was attacked on the 15th, with a chill and fever, which ran the usual course, and I found him clear of fever on the morning of the 16th when I called to see his father. Prescribed quinine, 3ss., ext. valerian, q. s.; make fifteen pills—one every two hours. The quinine was well borne, but the chill and fever returned at the expiration of twenty-four hours from the first one, and was

*This gentleman represented himself to have had yellow fever in 1850, at Havana, Cuba, and again at Victoria, Texas, in 1867.

marked by considerably more febrile heat than on the previous occasion, and decided tenderness in the bowels. Prescribed a saline purgative, to be followed with quinine as before, as soon as the fever abated. Found him much better on the morning of the 17th; continued quinine. 18th, had some fever during the preceding night, but it had passed off with moderate perspiration. Complained of the quinine nauseating his stomach and distressing his head. Directed its continuance at intervals of three hours, instead of two.

On the morning of the 19th found my patient much worse; fever had returned during the night and increased until it had attained a very high grade; thirst excessive; tongue large, red and glazed; retching and occasionally vomiting a little water and glairy mucus. Prescribed turpentine emulsion, with spirits nitre.; ice freely, and a mustard sinapism over the stomach. Saw him again in the evening. No abatement of fever; vomiting a dark granulated material, mixed with a yellowish, serous-looking fluid, and complaining of great pain in his bowels. Discontinued the turpentine, prescribed syr. rhei. aromat. and bicarb potass., and a cold compress over the stomach and bowels; ice.

20th. Fever abated considerably and vomiting arrested; pain in the bowels still very severe; continued the rhubarb and potash until it acted freely, evacuating large quantities of material similar to that ejected from the stomach the day before, except that it was thicker.

On the morning of the 21st I found my patient feverish, restless, and with some increase of pain in the bowels; urine scanty and very red; stomach quiet, however, and I thought doing reasonably well. Directed a weak mustard plaster over his bowels, and the acet. potass. mixture.

His fever rose gradually through the day, the pain in the bowels increased, and he died, with a temperature of 104° Fahrenheit in the axilla, at 11 o'clock P. M.

On Wednesday, the 22d inst., there were six deaths, as follows:—One on Crockett street, east of Front; one on Preston, between Milam and Bowie; one at the corner of Preston and Live Oak, it being the second death at that house; one at the corner of Jackson and Austin streets; one at the boarding house, on the south side of the square; and one at the corner of Bowie and Washington streets. Of these, the latter case only was under my care, and its prominent features are worthy of note. A German lad, aged ten years, had been gathering pecans, of which he had eaten freely; was attacked on the 13th with a chill and fever, for which his father gave him at night Simmons' Liver Regulator. The medicine failed to operate, the fever gradually increasing until the evening of the next day, when I was called. Found the patient hot and thirsty, with pulse 120 to the minute; tongue lightly coated and very red on the edges; bowels tender and painful: prescribed fl. ext. jalap, ʒj., tr. verat. vir. ♏iij., to be repeated every three hours until his bowels were moved; also, large cold water enemas alternately with the above, and cold compress over both stomach and bowels. The medicine acted early next morning, copiously, the first evacuation being dry and hard, covered with mucus, streaked with fresh blood; succeeding ones thin, dark and offensive. Fever abated some, but thirst and pain as great as ever; tongue dry; prescribed turpentine emulsion and spts. nitre alternately with Dover's powders. Saw him again in the evening, and discontinued the Dover's powders, the pain being relieved to a great extent, though the fever was unabated. Gave ice freely, and continued the cold compress.

16th. Patient about as he was on the preceding day. Treatment continued, with the addition of cold water enemas.

17th and 18th brought no decided changes; a slight abatement of fever; occasionally some perspiration, but undiminished tenderness of the bowels; treatment continued.

During the day, on the 19th, there was a gradual increase of fever, great restlessness and some delirium; bowels ceased to act from the syringe. Ordered acetate potass. mixture and the enemas continued, sometimes with soap and water, at others with salt and water.

20th. Patient rested better, but otherwise without change; prescribed aromat. syr. rhei., and bicarb. potass., which operated during the night, removing large quantities, first of dark, granular, offensive matter, and subsequently, thin discharges, resembling the bloody urine in hæmaturia miasmatica. Ordered the turpentine emulsion, with spts. nitre and creasote.

21st. Patient decidedly worse; fever high, restlessness intense, some delirium, and a total suppression of urine. Prescribed the potass. mixture at intervals of three hours, ice and the cold compress. During the day there was some improvement, and his father, observing the relief from the morphia in the potass. mixture, gave it every hour, under which, in three hours, he sunk into a deep coma, with a failing pulse and slow respiration, which gradually increased until the morning of the 22d, when he died, apparently from the effects of narcotic poisoning. No jaundice.

At 2 o'clock P. M. of this our second day of gloom and sadness, Dr. Azincourt* arrived from Galveston, and took charge, without ceremony or invitation even, of every case of disease he could hear of, unhesitatingly pronouncing each and every one "true and unadulterated *hæmagastric fever*, of the most malignant type." The utter recklessness of this decision determined me to telegraph Dr. Peete to come, or send some member of our profession competent to determine the matter; in response to which Dr. Samuel A. Towsey arrived two days later. The same "train" which brought Dr. Azincourt, however, gave us the assistance of Mr. Hardy Eddins, one of nature's own noblemen, in charge of a corps of nurses and an abundance of supplies, furnished by the munificence of our friends in Galveston. The energy and unflagging self-sacrifice with which he addressed himself to the task of supplying the wants and alleviating the sufferings of our stricken people will be cherished in the memory, and excite grateful throbs in many a heart, when his own is cold in the embrace he averted from numbers of our people.

Thursday, the 23d, was a cool, cloudy day, with a northeast wind and occasional showers of drizzling rain. No death during the day.

In the evening, Dr. W. B. Briggs, and some more nurses, arrived from Galveston, contributing greatly to the relief of Dr. Bowers and myself, as well as to the comfort and safety of the sick.

On Friday, the 24th, there were two deaths; one at an old hotel on the south side of the public square, three doors west of the boarding-house at which other cases had occurred, and one on the corner of Travis and Washington streets. Did not see either of them. Weather cool, damp and cloudy.

Saturday, the 25th. Another death at the old hotel, south side of the public

* Dr. Azincourt proved to be a disciple of Hahnemann, who, if he did not believe "the hair of the dog was good for the bite," believed something not much worse: and proceeded to dispense, in accordance with his diagnosis, infinitesimal yellow fever to his patients, without regard to symptoms or indications, at the proposed rate of seventy-five dollars per patient, notwithstanding he had contracted with the Mayor of Galveston to render his services for the daily stipend of ten dollars. It is due to Mayor Hurley to state, however, that he knew nothing of the gentleman beyond his own representation, that he had treated yellow fever recently, both in New Orleans and Shreveport. He did not remain long in Columbus.

square, and one just without the limits of the corporation, northwest of the town; the latter a patient of mine. This case was a German widow lady, aged thirty-five years; was attacked at her residence, corner of Preston and Live Oak streets, on the morning of the 20th, with a severe chill, attended with copious vomiting of some undigested food, succeeded by a paroxysm of fever, that passed off with free perspiration in the course of the day. Prescribed ordinary treatment for an intermittent fever. Chill and fever returned in about twenty-four hours. Having evacuated the stomach and bowels very thoroughly, increased the dose of quinine, but without avail. The chill again occurred at its regular period, and the succeeding fever was attended with nausea and some vomiting, but subsided with a copious perspiration, as usual in intermittent. Prescribed the turpentine emulsion, with spts. nitre and tr. aconite.

23d. Patient is free from fever, but stomach very irritable. Directed a blister, and continued the turpentine. Patient having been deserted by her kindred, was removed out of the corporation.

24th. No change; treatment continued, with ice freely.

25th. Patient much worse; vomits frequently water and mucus; urine suppressed; refuses medicine.

Dr. S. A. Towsey having arrived on the 2 o'clock train, I invited him to see this lady with me. He did not hesitate to pronounce it yellow fever, though he sanctioned my treatment, suggesting as a supplement to it a turpentine "stupe" over the lower portion of the bowels. She died at 11 o'clock P. M., without jaundice before or after death.

Mercury 82° Fahrenheit; wind northeast, and misting rain.

On Monday, the 27th, two deaths were reported, one of which, a negro, occurred at a boarding house on Bowie, between Walnut and Spring streets; and the other, a child, on Spring street, between Front and Travis. Did not see either of them. No other deaths occurred in town until Thursday, the 30th, notwithstanding we had a pretty sharp norther and cloudy, drizzling weather most of the time.

On Wednesday, the 29th, however, there were two deaths in the country, which resembled yellow fever very much, and, on account of the circumstances under which they occurred, are worthy of note.

Mrs. P's residence, on Washington street, between Milam and Bowie, was not quite a square southwest from the county jail, which our inefficient officers* had permitted to become intolerably filthy and offensive. She had lost a son with suppression of the urine some eight or nine weeks before she herself was taken. Then the young man, who had black vomit on the 28th or 29th of September, was confined at her house. As soon as the yellow fever was announced, she removed from town, and took refuge with a friend three miles south, whose residence was near the low margin of the river, and where the prevailing winds swept over the wet and putrid mass. She was attacked on the 22d, and died with black vomit on the 29th day of October. A lady friend, who assisted her to nurse her son first, then the young man, and finally herself, was taken a few days later, and died with black vomit and suppression of urine on the 5th of November. Yet no member of the family with which they were domiciled contracted the disease. I did not see this case, but gathered the facts from Dr. Towsey.

*The extravagant humanity of these same officers would not permit them to keep their prisoners in this jail, after the appearance of the epidemic. They took them out on the prairie, where they were so effectually guarded, and their health so well protected, that most of those charged with murder or other grave crimes escaped.

The other case, a Mr. Scott Price, aged thirty-five years, a northern man, but recently arrived in the country, was employed at Borden's meat factory, on Harvey's Creek, nine miles west of the town. Had not been away from his post, or had communication with Columbus or any other infected place for three months. Was taken with a chill on the 24th, accompanied with severe pains in the head, back and limbs, fever, which seemed to rise gradually for twenty-four hours, and then remained stationary for two days, and began to decline. On the fourth day he became jaundiced and had suppression of urine and nausea. I was called to him on the evening of the fourth day of his illness; found him extremely restless, but uncomplaining; skin a bright lemon yellow, vomiting occasionally a dark material, which, upon being allowed to stand a few minutes, deposited a dark fleecy-looking sediment, the supernatant fluid being a deep straw color and intensely acid. The patient died during the night of the fifth day of his illness. No other case occurred on the premises.

On the night of the 29th we had a light frost.

On Thursday, the 30th, Mr. B—— died at the old hotel, on the south side of the public square, probably from the effects of a tablespoonful of aqua ammonia, furnished by his druggist by mistake for liq. am. ar.

Another frost, and the mercury at 42° Fah. at 9 o'clock, A. M.

On Sunday, November 2d, there was but one death, and that occurred on Washington street, between Front and the river, where subsequently four other members of the same family died in succession, all of whom were treated by Dr. Briggs and myself in connection. Disease of the heart was undoubtedly the cause of death in one of these cases, though the intermittent character obtained in all of them, except the last, of which I will give the details hereafter.

On Monday, the 3d, there was but one death, a German girl, treated by her father with Simmon's Liver Regulator. This occurred on Travis street, between Washington and Milam.

On Tuesday, the 4th, three deaths occurred; one on Washington street, between Front and Travis; one mulatto woman on Washington, between Travis and Milam streets, and one negress, on ———.

On Wednesday, the 5th, there was but one death, on Washington, between Front and Travis streets.

Thursday, the 6th, there was but one, at the boarding house, south side of public square, after which it was evacuated, never to be occupied again.

Friday, the 7th, there was one death, on Chester street, at the eastern extremity of Preston.

Saturday, the 8th. One death, on Travis, between Preston and Dewees streets.

Sunday, the 9th. One, a negro, on Crockett, between Front street and the river. This case occurred in my practice, and was undoubtedly a well defined case of hæmaturia miasmatica.

On Tuesday, the 11th, one death, corner of Front and Washington streets.

On Friday, the 14th, there were two deaths, both in my practice; one, at the corner of Travis and Walnut streets, had recovered from original attack and relapsed, recovered, and relapsed again, and died. The other, on the corner of Travis and Preston streets, had no symptoms of anything but a remittent fever until the day of his death, and then peculiarities of the case suggested the idea that he was dying from poison.

On Sunday, the 16th, there was one death on Spring street, between Milam and Bowie.

Tuesday, the 18th, one death on Front street, between Walnut and Preston, the second death in this house.

Stiff norther blowing and bitterly cold.

Thursday, the 20th, one, on the corner of Washington and Front streets.

Saturday, the 22d, one death on Front street, between Walnut and Crockett, the third of this family.

Sunday, the 23d, one death on Bowie, between Spring and Walnut streets.

Thursday, the 27th, there were two deaths, both negroes, on Spring street, between Travis and Front.

Monday, December 1st, there were three deaths, two of the same family, on Jackson street, between Live Oak and Prairie, and one at the corner of Travis and Crockett.

Tuesday, the 2d, one, on Spring street, between Milam and Bowie.

Wednesday, the 3d, one, the second in the house, corner of Travis and Walnut streets, northeast corner of public square.

Thursday, the 4th, one, corner of Live Oak and Walnut streets.

Wednesday, the 10th, one, corner Prairie and Jackson streets.

Thursday, the 11th, one, Bowie street, between Spring and Walnut.

Friday, the 12th, one, on Spring street, between Milam and Bowie; had black vomit and hæmaturia.

Sunday, the 14th, one, corner Crockett and Front streets.

Tuesday, the 16th, there were three deaths, two on Spring street, between Bowie and Live Oak, and one at the corner of Austin and Jackson streets.

Wednesday, the 17th, one, Spring street, between Live Oak and Prairie, negro.

Wednesday, the 31st, the last case of the epidemic, died on Spring street, at the same house at which the death on the 17th occurred.

I have been thus particular in enumerating the deaths and their several localities, because they represent very fairly the extent to which the disease prevailed in different sections of the town, from the period of its inception until its termination. Of the cases that came under my care I have almost invariably given the leading characteristics; and, it will be observed, they were, in nearly every instance, marked by a distinct periodicity—palpable intermission or remission. I would not have it understood, however, that all of the cases that occurred presented this peculiar feature, nor, indeed, more than a small proportion of them. But, so far as my observation extended, at least, this periodicity was almost universal in fatal cases, while, where the character of a continued fever, with the large, red tongue, tenderness in the epigastric region, etc., before detailed, was maintained, patients generally recovered.

Some other points I have omitted to mention that are valuable in a diagnostic point of view.

The secretions and evacuations were almost invariably *acid*, even the lachrymal secretion and the saliva showed the acid reaction. After the first few days, too, I invariably took the temperature of cases of considerable gravity, and in no instance did it exceed 103°, rarely 102°. In the case of the patient who took the aqua ammonia by mistake, I was informed it reached 108°. I also tested the urine for albumen in a great many of the severest cases, but never found it in considerable quantities, and never, unless the urine was stained with blood.

Of the specimens of black vomit submitted, you will perceive that some of them have a large coagulum, others are changed to a dusky or slate color, and only one or two retain the characteristics of that substance, *i. e.*, black vomit.

In conclusion, it may be observed that while the disease made its appearance almost simultaneously in nearly every part of that section of the town to which it was subsequently confined, it failed to spread in the western quarter, indeed, ceased to prevail there to a very great extent until the latter part of the period of its prevalence, being confined mostly to streets near the river and around the public square, where filthy houses and neglected privies made the atmosphere intolerable.

Another fact of importance: There were quite a number of Northern, unacclimated men in town throughout the entire period of its duration, visiting and waiting upon the sick day and night, all of whom escaped unscathed. One of these men kept his family in town, and two of his children had the disease lightly and made rapid recoveries after the fifth day.

I have notes of some other cases presenting peculiarities that I desire to submit to the consideration of the medical profession, but the length of this paper admonishes me to seek another opportunity.

R. H. HARRISON, M. D.

THE EPIDEMICS OF 1873 IN DENISON, CALVERT AND COLUMBUS.

In the prosecution of the inquiry with which your committee was charged, many obstacles have been encountered—the chief and most formidable of which have been the paucity of accurate observation of the conditions antecedent to, and the phenomena characteristic of, the several epidemics in question. The importance of the subject, however, not only to the medical profession, but to the entire community of our people, has urged the effort, and albeit an unquestionable conclusion may not have been attained, it is hoped it has not been made wholly in vain.

The investigation contemplates the discovery of the "causes, character and natural history" of the several epidemics—and in the attempt to discharge this comprehensive duty, your committee has sought to divest itself of preconceived opinions as well as to exclude rigorously the hasty judgment of witnesses—accumulating from every accessible source such *facts* as are pertinent to the inquiry. In the compilation of these facts, free use has been made of the various published matter on the subject, as well as the testimony of competent observers, which, indeed, constitute the principal sources from which the data for this report are obtained.

In this connection your committee desire to express its obligations to Dr. W. L. Coleman, of Calvert; Drs. W. H. Howard, Eugene Palmer, B. Powell, and D. F. Stuart, of Houston, and Dr. G. Dowell, of Galveston, for the courteous promptitude with which they responded to our inquiries. Their several responses will be referred to hereafter, when the value of the information they furnished will be apparent.*

Of the epidemic in Denison, no information in addition to that contained in the able report of Dr. Alexander W. Acheson (Transactions of Texas State Medical Association, 1874, p. 133 *et seq.*), has been obtained. Nor is it presumed anything more is necessary to conduct the reader to a reliable conclusion. His detail of all the circumstances having relation to the inquiry is full; while the summary of

*Dr. Samuel A. Towsey, of Galveston, alone, of all the physicians addressed, formally declined to answer the inquiries of the committee.

symptoms attending the disease in typical cases, and *post-mortem* appearances in the few cases in which examinations were made, comprehends an abundance of evidence to establish the character of the disease beyond question, and its natural history is sufficiently known, at least to all southern and western physicians.

The epidemic in Calvert occurred under circumstances which afford, perhaps, equally as much evidence as to the causes, though their relation to the effect is not so palpable, nor is the character of the disease so evident. The obscurity in the case is enhanced, too, by the promulgation of hasty judgments in the premises, and subsequent efforts to find facts to support theories.

The assumption by prominent medical men that the citizens of Calvert were suffering from an epidemic of yellow fever, and all of the excitement and apprehension consequent upon an announcement of that kind, doubtless contributed much to blunt the perceptions and impair the judgment; and it is not wonderful that many important facts in the premises have been entirely overlooked, or, to a great extent, disassociated from their legitimate value.

In dealing with the question, therefore, your committee has ignored, as far as practicable, the mere opinions of the profession, while it has attempted a collection of established facts upon which to found an accurate judgment.

Pursuant to this idea, we may first consider the *topography* of the city and its surroundings, in connection with the season of the year, and such approximate meteorological observations as may be accessible—for most of which I am indebted to Dr. B. Powell, of Houston.

Calvert, with a population of about fifteen hundred souls, is located 31° north latitude, on the Houston and Texas Central Railroad, about five miles east of the low marshy lands contiguous to the Brazos River, Little River intervening, and immediately west of "*Mud Creek*," which, in its course from the northeast to the southwest and west, presents to the southern limit of the town quite a formidable belt of low, marshy swamp land, just beyond which is located an extensive beef packery, where large quantities of beeves are slaughtered, the offal from which is left, with characteristic indifference, to swelter and decay in the open air. The season of the year is very early autumn—the range of temperature extraordinarily high—the prevailing wind south, southeast and east, and the rain-fall greater than usual. According to Dr. W. L. Coleman, "during the months of July and August an *obstinate and unyielding* character" of malarial fever prevailed to an unusual extent. This fever, Dr. Coleman says, was a "*Continued Fever.*"

Dr. Powell, whose acquaintance with the topography and diseases prevalent in the place for some years past, and whose accuracy of observation and reliability no one will gainsay, says: "Malarial fevers always prevail there during the summer and autumnal months." Dr. Palmer says "the sanitary condition of the town was bad—pools of stagnant water, the decay of a rank growth of weeds and newly exposed earth from deep digging, contributing greatly to the unhealthy condition of the atmosphere incident to the location of the town. Dr. Stuart confirms the statement of Dr. Palmer, and on the same subject Dr. Dowell speaks of the town as "recently built, on timbered land, near Little River, and subject to malarial fevers." None of the observers indicate whether the hemorrhagic form of these fevers prevailed then or at any previous period.

These are all of the details your committee has been able to collect, of the sanitary conditions and prevalent diseases upon which the epidemic supervened—conditions, it must be confessed, looking favorable to the development of an epidemic of malig-

nant quality and overwhelming proportions, without the aid of the yellow fever germ, which it is alleged was introduced by the young man Hughes, from Shreveport, on the third of September, and from which the epidemic is presumed to have originated.

Of the case of this young man Hughes, Dr. Coleman gives the following description: "He arrived on the third of September, fleeing from yellow fever in Shreveport, where he had been employed as a clerk" *** "was much excited and alarmed." *** "On the night of the fifth he was taken with a chill, and I was asked to see him twenty-four hours afterward, in his room at the Haynes House. He presented all the characteristic symptoms of true, genuine yellow fever, of the most malignant character. The upper portion of his face was of a dark purple hue, the temperature high, and the pulse, which had already reached the maximum, was beginning to decrease. The tongue was heavily coated, and he complained of soreness of the throat. I ordered three compound cathartic pills and mustard foot-bath. The next morning the pulse had reached eighty-four and was still steadily decreasing, the temperature being rather on the increase. The mucous membranes of the mouth, throat and nostrils had become spongy, with tendency to hemorrhage, a considerable quantity of dark black blood being discharged from these surfaces during the day. The following morning, Wednesday, September the 8th, his pulse was down to sixty, and the temperature almost normal. Had he remained quiet, he might possibly have recovered; but feeling much better, he concluded to change his boarding-house, and without consulting me, got up, dressed, and walked the distance of two blocks to Main street, and took a room up stairs in a brick building. On visiting him an hour afterwards, I found all the symptoms aggravated, with incipient delirium and his body turning very yellow. He continued to grow worse, and died at six o'clock on the morning of the 10th, throwing up a small amount of black vomit. *** After his death I pronounced it a case of yellow fever, and made the attempt to have his bedding burned and the room fumigated." *** "The bedding upon which Hughes died, instead of being burned, was thrown upon the roof of a little house almost at the foot of Main street, and left there three weeks in the sun. The prevailing wind blowing almost up the street, the whole town soon became impregnated with the poison." From that time until the 27th, several other cases occurred, of which two fatal ones were at the Haynes House, and these latter cases developed the panic which evacuated the town of nearly two-thirds of its inhabitants.

"On Monday, the 29th, the authorities telegraphed to Houston for aid. Three physicians were sent up to examine into the disease and report. Two of them, and one of them an old physician of forty years' experience in your city (New Orleans), after remaining here twelve hours, decided, positively, that there was not a case of yellow fever in town, and returned. Dr. Howard *** remained, stating that I had yellow fever, and that there were several other cases in town."

These quotations are from Dr. Coleman's letter to the New Orleans *Medical and Surgical Journal*, January, 1873, and are made copious, as affording the only available description of the epidemic in its inception, as well as the different views of its character. At a later date, when the disease had attained the proportions of an epidemic, other physicians, of distinguished ability, visited Calvert for the purpose of determining the character of the disease, but the same discordant opinions obtained amongst them that characterized the investigations of the first commission; thus leaving the important question as much in doubt as it was in the beginning.

The subject-matter for the investigation of your Committee is thus fairly represented, and it may now proceed to consider such additional testimony as it has been able to accumulate through its correspondence and conference with the various medical men who observed it on different occasions during its progress—first submitting the conclusions of the observers, and then their recital of the considerations upon which they were founded.

The opinion of Dr. Coleman has already been indicated; as has also that of Dr. Howard, of the committee from Houston which visited Calvert on the 29th of September. Dr. Eugene Palmer, of the same committee, whose learning and experience afford eminent qualifications for a reliable judgment in the premises, is clearly of the opinion that it *was not yellow fever*, but that it was a *hemorrhagic malarial fever*. Dr. D. F. Stuart, another member of said committee, inclines to this view of the case also, and cites the late Dr. W. B. Fields' observation to the effect that the same disease had prevailed in the vicinity of the Brazos river for several weeks before it appeared in Calvert.

The reputation of both of these gentlemen for scientific attainments, accuracy of observation and reliability, is beyond question.

Dr. Greensville Dowell, who visited Calvert at a later period, considered the epidemic a complication of *yellow fever* and *dengue*, and so denominated it in a paper submitted to the Sixth Session of this Association; while Dr. B. Powell, whose eminent qualifications and extensive experience of disease in Calvert and its vicinity, give weight to his judgment, seeing it at the same time with Dr. Dowell, was as thoroughly convinced that it was only one of the modifications of *malarial fever* to which that country has heretofore been subject.

Now, let us look at the basis upon which this conflict of opinion has been established.

With the purpose of contributing as much as possible to the solution of the problem, your Committee addressed the following letter to the several gentlemen whose views have been quoted:—

COLUMBUS, TEXAS, March 22d, 1875.

My Dear Sir:—

The Texas State Medical Association, at its last session, appointed a Special Committee to investigate the "Causes, Character and Natural History" of the Epidemics of 1873, in Denison, Calvert and Columbus. As chairman of that Committee, I desire to collect from skilled observers the facts upon which the solution of the several inquiries rests. Will you, therefore, do me the favor to return answers to the following questions with respect to the epidemic in your city:—

1. What were the prevailing types of disease and what peculiarities, if any, were manifest prior to the onset of the epidemic?

2. What was the sanitary condition of Calvert and vicinity immediately before and at the commencement of the epidemic? What were its exposures to noxious influences?

3. What was the general character and course of the disease (epidemic) from its inauguration to its termination. What were the morbid phenomena and their sequence?

4. Was it a continued fever, or was it characterized by remissions or intermissions? Was it composed of more than one paroxysm?

5. Were the pulse and temperature accurately noticed, and what was their course in representative cases?

6. What was the character of the evacuations from the stomach, bowels, and kidneys? Did the urine contain albumen?

7. What were the symptoms referable to the stomach, liver, spleen and brain?

8. Were any *post-mortem* examinations made, and if so, what were the revelations?

Please let your answers include as much detail of fact as practicable, and add any other information in your possession that is calculated to elucidate the problem.

Very respectfully, yours,

R. H. HARRISON, M. D.

All of the observers concur in the statement that "*Malarial Fevers*" prevailed in Calvert prior to the appearance of the epidemic; and the only peculiarity noted is by Dr. Coleman, to the effect that they were "*continued*," *** and "disappeared upon the establishment of the epidemic, with one or two exceptions." All agree, too, that the sanitary condition was exceptionally bad, and the exposure to noxious influences great—as indicated by the topography of the place, foul, open privies, swampy surroundings, and close proximity to a large beef packery and "numbers of slaughter pens around the town."

In the several replies to the third, fourth, fifth, sixth and seventh of the foregoing inquiries, the discrepancies of observation and opinion are so numerous and great as to involve the whole question in an almost inextricable confusion.

Dr. Coleman says:—

"The fever was continued, with no intermission, and confined to one paroxysm. In some few cases there was a remission, but it was always in fatal cases, and I have observed this in all other epidemics. I regret to say the pulse and temperature were not accurately observed through the epidemic. In the first four or five cases I kept a register of them, and they correspond with Faget's description of the same. I was sick, myself, nearly two months, and had five other cases in my family, so I know but little, personally, about the rest of the cases; and I think a physician ought not to offer anything but his own personal observations. I know of no examination of urine, and no *post-mortems* were made.

"In my own case I threw up coagulated blood, which I think had been swallowed during sleep. Hemorrhages from the nose, mouth and mucous surfaces generally, were common, and, in some cases, hard to control. About the fourth day of my relapse I passed large quantities of black vomit discharges from the bowels; my son did the same. He was on the verge of convulsions when these commenced and relieved him. The disease differed from no epidemic I have seen since 1853, except that it seemed more easily communicated, and I know of several instances where it was communicated to country people."

While Dr. Howard, in reply to these same inquiries, asserts:—

"It was intermittent and remittent—the pulse ordinarily below 100—gastric irritation not excessive—no enteric inflammation—and would not tolerate quinine. In all bad cases the pupil of the eye was dilated from the onset, and this was a distinguishing feature. I observed but few cases, but this was the differential symptom between yellow fever and malarial fevers."

Dr. Howard's vast experience and the high esteem in which he is held, is our guarantee for the reliability of his statements.

But to return to this subject of opinion. Dr. Greensville Dowell, in his reply, gives us the following summary:—

"Pulse from 80 to 100—rarely over or under, except in extreme cases. Temperature about 102°, rarely over 104°. Evacuations from the stomach in first twenty-four hours bilious, with food and bile mixed; or water and mucous in white flecks. The ejections were various, following no general rule, as some cases never vomit at any time during an entire attack. The vomit in first stage is very dangerous, unless produced by medicines; generally getting worse, from white to flakish white, and finally black or rust-colored, with, at times, pure blood, sometimes only a mouthful or so, and at others for days, and by bowlsful, with great tenderness over the epigastric region, with slight swelling.

"Bowels were as in other fevers, perfectly natural, or with green stools and indigestible matter, produced, usually, by purgatives. In extreme cases, *melæna* were very offensive, with a dull black matter mixed with blood. Generally attended with a livid yellow skin, and never occurring before the fifth day, and often as late as the fifteenth, ending most usually in death, being as fatal as black vomit itself. There is usually but little smell about black vomit at any stage, but this *melæna* is the most offensive discharge I ever smelt.

"The urine was generally perfectly natural—a little redder in those who were subject to bilious attacks, or were taken with bilious fever, which often runs into yellow fever. In most epidemics the

urine is perfectly natural, when the skin is yellow or pumpkin or livid yellow: a true test of yellow fever as compared with jaundice, or hæmaturia miasmatica. I do not recollect of ever seeing bloody urine in a yellow fever case uncomplicated with malaria or jaundice. Urine is frequently suppressed at the close or cessation of the fever, and the patient usually becomes furious and uncontrollable, and dies from uræmic poisoning. This is the common cause of death in most of the cases treated by the sweating process and restraint from water, and no mercury given. Sometimes there is a large amount of albumen present, but this is not at all reliable as a means of diagnosis, as we often find the urine entirely free from it from the first to the last.

"*There are no constant symptoms in yellow fever.* I have had undoubted cases in which the stomach was not the least disturbed; and again, the patient vomits from the hour taken until death, with great præcordial tenderness; commencing with water, mucus and blood; then bile and mucus; then, from the third day on to death, *black coffee-ground matter without much taste or smell*, sometimes acid and sometimes alkaline; and when this black vomit continues from day to day, it will increase in redness and be almost pure blood, and blood will ooze out of the face, nose, beard, and from blisters and any sore.

"Liver is often perfectly sound, even in malarial patients, or patients exposed to our rivers and prairies. Again, it will be tender and of a grayish appearance, and become soft after the fifth or eighth day.

"Spleen in most cases is soft and easily penetrated with the finger, filled with dark, very dark or black blood, but at other times it is perfectly sound, and even in cases dying of black vomit.

"Brain always clear until the third or fourth day, usually painful, and in cases where patients are exposed to malaria, are out of their heads or slightly delirious; in the first twenty-four hours the pulse and heat is generally at its highest.

"Kidneys are usually very hard, and patient sometimes complains severely of pain in their region, but this is not usual, and not so great as in bilious or dengue fever.

"The blood undergoes a complete change and becomes fibrinated the first day or stage of the fever; then it changes to a semi-fluid state, and will ooze out through the skin, the mucous membranes, such as the nose, the mouth, about the teeth, from the tongue, from the stomach, and in any part of the intestines and from the womb, which is common in menstruating women, and soon after the flow has normally ceased. Melæna are but decomposed blood mixed with the alimentary secretions, which gives it the awful smell and makes the difference between it and black vomit, which usually has no smell of itself when first vomited."

* * * * * * * * * * * * *

Comment on these extracts is deemed unnecessary. The inconsistencies of the several observers with one another, and incoherence of one of them, are sufficiently evident without an effort on the part of the Committee to display them; while the reflections they suggest are too humiliating to our profession to be indulged.

Drs. Palmer, Powell and Stuart, who saw the epidemic on the same occasion, and as manifest in the same subjects, to a great extent, did not recognize it as yellow fever; and, in reply to the interrrogatories submitted, gave the reasons for their faith, as follows:—

Dr. Palmer says:—

"The cases which we saw, on our first visit to Calvert (on the 29th of September), were all of a remittent or intermittent type, the accesses being twenty-four hours apart. Among the twenty cases, not *one* case of a continued fever was met. Our report stated that we found '*no yellow fever at Calvert.*' At the time of our visit the disease had become intensified—the cases were not uniform, and I have no doubt but that some of the severer ones resembled a 'continued fever.' Many suffered from pain in the head, diffused and contusive, not confined to the supra-orbital region, as is always the case in yellow fever. Fatal cases of this class were turbulent from end to end; and we do not find among the reports of cases thus far rendered that second stage of marked repose, which is so characteristic of yellow fever.

"We thought this fever to be malarial in all its different phases, and we think so still. It was not cholera at Denison, yellow fever at Calvert, nor petechia hemorrhagica at Columbus. We rather say, with that distinguished physician, Dr. J. C. Faget, of New Orleans, 'what a protean is this malarial poison.'

"The injected and yellow conjunctiva, periodicity in vigorous constitutions, the bronzed and mottled liver (reported in Denison), leave no doubt of the malarial character of that epidemic—while

the appearance of the tongue, so strongly insisted upon by some observers in typho-malarial cases, points to the same end. Indeed, every phase of the epidemics of 1873, so far as Denison, Calvert and Columbus are concerned, may be included in the four divisions made by Beringer, Ferand, Faget, Michel, and other modern observers who have written upon malarial fever of the hemorrhagic kind.

"We made no record of the temperature of the body or character of the pulse, nor were the secretions from the kidneys chemically examined. We made no examination of the 'black vomit' by the microscope, and we are not aware of any *post-mortem* examinations."

* * * * * * * * * * * * *

Dr. Powell replies:—

"3, 4. The general characteristics of *the fever* were different from any fever I have ever met with in many particulars, and I feel I should do you and myself injustice did I not fully describe what I saw and what I heard from Drs. Fields and Gilson, both victims of the pestilence. With the above-named gentlemen, I visited some fourteen cases in all stages of the disease, from the first symptom to dissolution, and will endeavor to give as lucid a description as my poor memory will permit. The typical case was ushered in with a chill, lasting from fifteen minutes to two hours, followed by the hot stage. The hot stage lasting from ten to twenty hours, when remission and frequently a complete intermission occurred. During the hot stage, vomiting of a yellow matter in large quantities frequently annoyed the patient. This ejecta was similar in appearance to yellow corn meal mixed intimately with thick, glary, ropy mucus. There was always distressing nausea whenever this peculiar matter was present. The urine was invariably deeply colored, and frequently presented the peculiar appearance of the urine in malarial hæmaturia. The discoloration of the skin I only noticed in three cases, and only well marked in one. I saw two cases where the slate-colored vomit occurred; one died two hours before our visit, the other lived three days from the first appearance of this peculiar vomit. After an intermission or remission of from four to twenty-four hours, the fever returned in full force and followed the course of the first paroxysm, and several cases continued to follow this course for ten days, until a slow convalescence or death ensued. Drs. Gilson and Fields assured me they could show me cases of '*this disease*' in the Brazos bottom, eight and ten miles distant.

"5. Not noted.

"6. Did not note evacuations from bowels. Tested urine in three cases—found some albumen—saw some specimens tested by Drs. Gilson and Fields, in which albumen was found; these were from the earliest cases. Several specimens had somewhat the appearance of the urine in malarial hæmaturia.

"7, 8. First answered above. The second, can only say my time was so occupied while in Calvert, that it was impossible to note only most prominent symptoms.

"9. None that I know of.

"10. In reference to the specimens of vomit you were so kind as to leave with me for examination (microscopically), I think I discovered in two of the specimens deteriorated blood corpuscles, though I would not be positive, as they were very old when received, and such chemical changes may have taken place as to render their microscopical appearances delusive. I do not wish to obtrude my opinions upon you, my dear doctor, yet I will not permit this occasion to pass without reiterating what I said to you in conversation, that the epidemic in Calvert differed so much from all epidemics of yellow fever that I have witnessed, that I could not bring myself to believe that the Calvert disease was yellow fever—first, the intermission and remission continued from day to day; the bloody character of the urine; the peculiar *yellow* vomit; the absence of peculiar *black* vomit; and last, but not least, the non-exemption of several (18) who were known to have had yellow fever heretofore; though their deaths (and all died I believe) were attributed by one of the writers on this epidemic to excessive use of alcoholic liquors. I fail to see the exact point where one hundred persons who never had yellow fever should take it and die, and eighteen who were known to have had yellow fever should take the same disease and die, and their death be attributed to excessive drinking.

"I am decidedly of the opinion that the *Calvert epidemic* was what the profession understands as *malarial hæmaturia* or *hemorrhagic malarial fever*, modified materially by the dengue epidemic then widely prevalent throughout the Southern States, and possibly still further modified by occult local causes, of the origin and nature of which we are still totally ignorant."

And Dr. Stuart's answers are:—

"2. The cases which we saw on our first visit to Calvert were all of a remittent or intermittent

type, the *accesses* in the latter twenty-four hours apart. Among fourteen cases, the number we saw during our first visit, not one was continued fever.

"At the time of our second visit, six days later, the disease had become intensified; the cases were not uniform, and we have no doubt but that some of the severer ones were continued fevers. Many suffered with pain in the head, diffused and contusive, not confined to the supra-orbital region, as is always the case in yellow fever. The fatal cases of this class were turbulent throughout their entire course.

"3. We made no record of the temperature of the body or the character of the pulse, nor were the secretions from the kidneys chemically tested. We made no examination of the black vomit with the microscope, and we are not aware of any *post-mortem* examinations being made in any case that died at Calvert.

"In reply to your questions about the health of the town before the disease appeared in Calvert, the late Dr. Fields, who was an accurate observer, informed us that it was not good, and that the disease had prevailed on the borders of the Brazos river some weeks before it invaded the town of Calvert, and in his opinion it was, up to the time of our visit, the same disease."

In conclusion, your Committee beg leave to submit the following excerpts and dismiss the subject—believing that its further discussion will be productive of more harm than good. In the discussion of yellow fever, Dr. Copeland (Med. Dict., vol. 3d, p. 193) says:—

"From what has been advanced above it may be admitted without any assumption, 1st—*that this pestilence is altogether different in its causes, progress and nature from every form or grade of remittent fever.* 2d—*That it is infectious in its nature, among the predisposed, and more especially in a warm, humid and close atmosphere;* and 3d—*That it attacks the human frame only once, the exceptions to this being even fewer than in respect to any other infectious malady.*"

And (p. 195) in reply to the query whether remittent or periodic fevers proceeding from malaria can "*so change their characters and properties under circumstances of crowding, insufficient ventilation, and a high range of temperature as to become this distemper and to assume its infectious properties:*—

"The occasions certainly have not been few on which a large number of persons affected with remittent or periodic fevers produced by malaria have been confined in close apartments, or *otherwise placed in circumstances favorable either to the evolution of a new character in these cases or to the production of a distemper with different properties from those attending the pre-existent malady;* and yet I can find no satisfactory evidence of such conversion of disease having occurred within the tropics, *or in more temperate climates during hot seasons.*"

"Remittent fever is characterized by the occurrence of remissions, whence is derived the name of this disease, and it is apt to eventuate in intermittent fever. Yellow fever is devoid of remissions, and does not end in intermittent paroxysms.

"Yellow fever attacks chiefly unacclimated persons. Acclimation does not protect against remittent fever.

"An attack of yellow fever exempts from a subsequent attack in the immense majority of cases. This is not true of remittent fever."—Flint's Practice, p. 940.

"Though the subject of tropical fevers is too little known to warrant decided opinions on many points, yet the true yellow or hæmagastric pestilence is so clearly stamped with characters so peculiarly its own, that it takes its place as a *specific fever of a continued* * * * *type.*"—Aitken, vol. 1, p. 439.

"The identity of the yellow fever miasm with the malarial miasm has been widely maintained, and in the West Indies it is still not unusual to hear the similarity of the two infectious materials insisted on. The difference in their operation is said to depend only upon the person affected. *But besides* various other grounds for rejecting this view, we have the fact that malaria is chiefly developed in rural swampy regions, while yellow fever is a disease of cities.

* * * * * * "The refuse which accumulates along the shores, and comes partly from ships and partly from houses, is often, through inefficient police supervision and carelessness of the inhabitants, allowed to be exposed for a long time. Being soaked twice a day with sea-water at the flood-tide, and then at the ebb subjected to the influences of the tropical sun, such substances rapidly decompose, and undoubtedly furnish a most congenial soil for the development of the very minute organisms which we accept as the source of yellow fever. But they must, from their mode of opera-

tion, have a *very different character and differ essentially* from other miasmal seeds, and in reality this difference is most probably due to the *surroundings of a port.*"—Haenisch, Ziemssen's Cyclopædia, vol. 1, p. 493.

"The contagiousness of yellow fever formerly afforded a fruitful topic of discussion among medical men. The course of the late epidemic, to all candid minds, must have finally settled the question; and we shall only revert to the subject very briefly, for the purpose of giving direction to the public mind. The evidence going to demonstrate the fact that no one ever contracts the disease from contact with an individual laboring under it, is at the present day so overwhelming as not even to admit of argument. In no instance coming under our observation did a case occur where a suspicion of its being contracted by contagion could for a single moment be entertained. The testimony of every physician who practiced in Portsmouth goes to sustain us in this declaration. To take this disease, a person must be exposed to the atmosphere of the locality where it prevails."—Schoolfield, Epidemic of Portsmouth in 1855, *Va. Med. Jour.* for May, 1867, p. 372.

"That yellow fever is a specific fever, caused by the introduction into the human organism of a specific poison, which manifests itself by the production of specific symptoms.

"That this specific yellow fever poison is not of the same nature as our common malarial or paludal poison, and is not generated through the operation of the same agencies.

"That, consequently, specific yellow fever, epidemic and pestilential, is not a variety of malarial or paludal fever—that is to say, of what we commonly call bilious remittent fever—but a fever *sui generis*, and independent of all malarial influences."—Cochran, Epidemic and Endemic Diseases of Mobile, p. 17.

"As far as my investigations extend, albumen is an invariable constituent of the urine in well-marked cases of yellow fever, and may appear as early as the first day of the disease, but most generally it appears upon the second, third or fourth day.

"The first fact recorded with reference to the occurrence of albumen in the urine of yellow fever is to be found in the following note, by Dr. John Davy, to the third edition of Dr. Daniel Blair's work on the yellow fever of British Guiana:—

"'In many instances, in the fatal cases of yellow fever in Barbadoes, the kidneys have exhibited a congested state, with ecchymosis of the investing membrane; and the urine, during life, has been found to be albuminous, coagulating, when heated, on the addition of nitric acid; this I have learned from Staff Surgeon Dr. Collings, who has made many observations and experiments on the subject.' * * * * * * * * * * * *

"Blair, in his subsequent report, records similar facts."—*British and Foreign Medico-Chirurgical Review*, vol. xvi, appendix, p. 245.

"Crocker Pennel says that albumen is always present in the urine of yellow fever, and sometimes in such quantity as to make the urine quite solid with heat."—*Medico-Chirurgical Trans.*, vol. xxxvi, p. 245.

"Ballot found albumen invariably in three hundred cases.

"Dr. Robert D. Lyons gives as a result of his examination of the urine during the Lisbon epidemic of 1857, with reference to the presence of albumen:—

"'Albumen was found in the urine in the following order of association:—

"'(*a*) As the only abnormal element, with or without other blood element.

"'(*b*) In company of abundant deposits of lithates, with or without deposits of purpurin, or other coloring matters in excess.

"'(*c*) In connection with biliary coloring matters, the presence of which was shown by the usual re-agents.

"'(*d*) In connection with pyrexial states; and

"'(*e*) In connection with apyrexial states.'

"Various other observers, as Dr. B. F. Gibbs, surgeon U. S. N., and Dr. Peyre Porcher, of Charleston, have confirmed the accuracy of the original observations of Dr. Collings, as contained in the work of Daniel Blair."—Jones, Natural History of Yellow Fever, *N. O. Med. and Surg. Jour.*, p. 467.

"One of the most interesting forms of pernicious malarial fever is that marked by a tendency to hemorrhages. The tendency to hemorrhage is sometimes general to the system, but in a great majority of instances it is limited to some particular surface. One of the strangest facts with regard to hemorrhages in malarial diseases is, that in certain epidemics the bleedings occur almost or quite exclusively from the same selection of surfaces. * * * * * * *

"If yellow fever be taken as a type of hemorrhagic disease, it appears probable that the last-mentioned conditions concur in the production of the hemorrhage. At least, we feel warranted in stating that the destruction of blood consistency is merely a clinical event, and that depraved nutrition of solids must and certainly does very soon ensue. The consequences are, that in grave attacks of yellow fever the disposition to hemorrhage is so universal to the system that, to borrow a strong expression,

which I have heard used to define the hemorrhage, the 'blood slops out' wherever the capillaries are not supported by dense tissues. It must be extremely rare that a hemorrhagic crasis as general as this obtains in uncomplicated malarial fevers. Nevertheless, localized hemorrhages, or hemorrhage restricted to particular surfaces or tracts, do attend certain malarial attacks, and, as has been said, what is remarkably strange, they are phenomena signalizing special epidemics to a wonderful degree, while other epidemic visitations, scarcely less fatal in results, may be entirely exempt from them. Surgeon B. F. Gibbs, U. S. N., writing of the 'calentura,' or congestive fever of Nicaragua, states that 'black vomit, the almost pathognomonic symptom of yellow fever, never occurred; there was, however, in the collapse, the development of hemorrhage from the lungs and stomach, as well as the fissures in the tongue.'

"Alvine hemorrhages, 'colliquative bloody stools,' are often referred to as having characterized certain epidemics, and bloody urine is spoken of by many authors, old and recent, as a grave clinical event.

"Wunderlich says: 'Hemorrhages are very frequent in malarial diseases. In more than half the cases of recent intermittent fevers, more or less abundant epistaxis presents itself, and is sometimes repeated. But it is when a prolonged cachexia already exists, that with more certainty these hemorrhages and other sanguineous extravasations present themselves.'

"It would seem from these observations, that malarial maladies may be attended by hemorrhages under two somewhat different conditions. First, although very rarely, the hemorrhages are due to morbid processes set up by the fever-producing cause, and in that event may occur in acute primary attacks of malarial fever. The morbid processes in this class of cases must relate principally to alterations of the blood, and those commotions of circulation so characteristic of these fevers."—Bemiss, *N. O. Med. and. Surg. Jour.*, New Series, vol. 1, p. 42.

No limit can well be fixed to the amount of matter of this character that might be produced, but any addition to the foregoing is deemed unnecessary. The discriminating reader will have no difficulty in making the application.

Of the epidemic in Columbus, your committee has failed to collect any facts differing from those submitted to the last session of this Association, in view of which the foregoing data are as applicable, in estimating its character, as they are to the epidemic in Calvert.

One other remark and we are done. Yellow fever is alleged to have occurred at various times within the State, notably at Hempstead, Brenham, Chappel Hill, Alleyton, Fayetteville and La Grange (all inland towns and villages) in 1867. Now, although it was prevailing all along the Gulf coast at that time, and nearly all of these places were "quarantined" against it, it is probable that each of them had some intercourse with infected localities, and they *may* have acquired the disease in that way; but it should be borne in mind that every one of them had been exposed to yellow fever infection, repeatedly, on former occasions, without contracting the disease or incurring any ill consequences from the contact. If then, in addition to these facts, we take into the account the palpable exposure of the several places to malarial poison, a season and surrounding circumstances favorable to its profuse development, we find, in the opinion of your committee, abundant reason to regard the question of the prevalence of yellow fever in these places, on this occasion, as far from being settled—unless, indeed, we accept the theory of *varieties* in the disease, and adopt the nomenclature of our distinguished and venerable confrère of Galveston, and call it "*Texas Yellow Fever.*"

The question is of importance as affecting the fair fame of our State, and deserves more careful attention than has yet been bestowed upon it.

REVIEW OF YELLOW FEVER REPORTS.

YELLOW FEVER EPIDEMIC IN 1833.

The first appearance of this disease in this State, so far as I can learn, was in 1833. Dr. John Tinsley and the late Dr. Jeager, of Galveston, were then living in Columbia, on the Brazos, and in partnership; the former a druggist and the other a well-educated German physician. There were about sixty cases and about thirty-two deaths. This history I received direct from Dr. Tinsley, and corroborated by Dr. Jeager and a Mr. James Hahr, of Columbia. Columbia was then one of the principal ports for introducing goods into the country, and ships were there from New York and New Orleans. The mouth of the Brazos was the principal port of entry for the State at that time. Asiatic cholera was also introduced that year, with yellow fever, and prevailed together in the fall. There had been a great overflow in the Brazos that spring, and the water was higher than was ever known before or since. Cholera again appeared on the Brazos in 1842, but yellow fever has not appeared on the Lower Brazos since, except sporadically. It was very bad in Richmond in 1853, but did not occur below that point, nor did I ever hear of a sporadic case below Richmond, up to 1853, and I was then living at Sandy Point, in Brazoria County. The epidemic of yellow fever in 1833, as described to me by Dr. Tinsley, was of the congestive type, and most cases died with black vomit. It was of an asthenic character. The treatment was mercurials, quinine and opiates. About every other case died. The next time the disease appeared was in 1839, of which Dr. Ashbel Smith has given a faithful account in the *North American Journal of Medical Sciences*, vol. iii, page 213 (1839). This was a very fatal epidemic. Dr. Smith says that it prevailed on the Strand and did not cross the morass, now called Bayou, south of the city. Dr. Dickerson says it was introduced from New Orleans, on the 27th or 28th of September. Dr. Smith says from the 30th of September to the 8th of October the thermometer was from 84 to 88 degrees, but on the 9th there was a norther blowing, and it fell to 66½ on the 11th. "Within the fifteen hours immediately preceding the norther and the fall of the mercury, I was called to eight new cases, and I had been informed of some others. During the prevalence of the norther, I do not believe, after careful inquiry, a single new case occurred. Subsequently the epidemic reappeared in a somewhat modified form, the first fresh attack recurring, I believe, about 5 P. M. on the 11th."

He further says the disease continued until the 7th of November, when there was a slight frost, which he hoped had put an end to the epidemic, but does not say it did, but remarks: "That although the northers prevented new cases, they were believed to be pernicious to persons seriously attacked." Galveston was settled in 1836, and no cases are reported until this epidemic, though they were in weekly connection with New Orleans. The town then contained about two thousand inhabitants. Local filth and commercial intercourse were both present in Galveston, and Dr. Drake says the origin of this epidemic is undetermined, after quoting Dickerson, who says it was introduced from New Orleans.

Dr. Smith at first used calomel as a purgative, but abandoned it for rhubarb and senna given in infusion. Dr. Smith gives the post-mortem of eight cases; in the stomach he found black vomit and thickening and softening of the mucous mem-

brane (always greater near the pyloric extremity), which was sometimes injected, at others a pearly white anæmic duodenum. Dr. Smith says the duodenum was less often affected than the stomach.

THE OTHER INTESTINES.—Dr. Smith observed tumefaction of the glands of Peyer, and he saw patches of hyperæmia in various places. Black vomit was common, and in one case the color was remarkably white and contracted; there was a deficiency of bile in all cases, but in none a structural derangement of the liver. The kidneys were sound in every case, the bladder was generally empty and contracted, but in one case he found it nearly filled with limpid urine. In another the quantity was smaller, with flakes of white mucus, and the entire internal coat was engorged with blood, giving it the appearance of the lining membrane of the eyelids in conjunctivitis. In a single subject, immediately below and rather behind the kidneys, near the spine, on each side, there was a clot of blood in the cellular tissue, three inches large and half as much in width. Dr. Smith found the heart sound; sometimes there was an unusual quantity of yellowish serum in the pericardium. The limbs were rigid. Dr. Smith's account is the most complete history I have found of any epidemic that has yet occurred, and I have above given his special observations for future reference. In 1839 the disease also prevailed in Houston as an epidemic, and was treated by Dr. Ewing with laxatives, baths, oil, quinine, venesection and cathartics, with about the same success, but he accords his opinion in favor of mercury. The disease again became epidemic in Galveston and Houston in 1844. I cannot find any accurate account of this epidemic, and only an allusion to it by Dr. McCraven, stating that he followed the same plan as he did in 1848, of which epidemic he has given us a very good and succinct account as it prevailed in Houston that year. There were a few cases in Galveston in 1847 and 1848, but not considered epidemic.

YELLOW FEVER IN HOUSTON, 1848.

Dr. McCraven says the first case came under his notice on the 30th of August; it was under the care of another physician, and in the fifth or sixth day when he saw it. "It was a well-marked case; hemorrhage ensued the next day, and black vomit and death the day following." This case occurred at a boarding-house, near the steamboat landing; and he saw another case in the same house, which proved fatal on the sixth day. The landlord died, and his wife and two or three children, in this house. Cholera made its appearance in this same house, in some German emigrants just from Germany, on the 20th of September of this same year, 1848. (Cholera also came to Columbia in 1833, the same year yellow fever came, as I have before stated; and in 1866 it was in Galveston, both introduced about the same time.)

Dr. McCraven further stated that the fever, during the first week of September, occurred in various other parts of the city, and in a few days more the epidemic was fully developed and general throughout the town. "It continued until after frost, very few unacclimated persons escaping, and some who had previously had the disease suffered a second attack. Several of these I had attended in 1844," says Dr. McCraven; "none of them were fatal." I presume he means those who had a second attack. The deaths amounted to something over a hundred, perhaps six or seven per cent. of the whole number of cases. The epidemic appeared in every variety of type, from the mildest to the most malignant; the latter was comparatively rare, the mild cases greatly predominating. He states that the disease was easily managed, and that he treated about three hundred in all, and only lost seven—only losing three cases he treated throughout, being one per cent.

he lost under regular treatment. "Many of the cases were so mild that but for the prevailing epidemic they would not have been classed with it." He gives it as his experience that during an epidemic but few other types of fever occur. I believe this is an error, and that many cases of remittent fever are called yellow fever, and one-third of the cases called yellow fevor, during an epidemic, are of the malarial type. Dr. McCraven says most of the children had fever, and he does not believe that natives are exempted, but he has many reasons for believing otherwise; though in young subjects its attacks were very mild. The population was about five thousand, and of this number some fifteen hundred or two thousand were attacked. The deaths amounted to something over a hundred, perhaps six or seven per cent. of the whole number of cases. All I can say, these are very vague and unsatisfactory statistics, and consequently no just conclusions can be drawn from them. "Hemorrhage," says Dr. McCraven, "and black vomit, were more frequent than I have heretofore witnessed." This is strange, after telling us he had only seven deaths in about three hundred. How is this? Surely he must have written without thinking.

Dr. McCraven says he does not consider a man a fool who believes that yellow fever is contagious, but knows of "no rational grounds to suppose that the disease was imported last August;" but he had come to the conclusion "the disease was of domestic origin." The city was badly policed and badly drained, and filthy, and there was not much rain during the latter part of summer, making it remarkably dry. I believe this to be an error and that no one has a second attack, and as Dr. McCraven says none died, therefore none had it. The late Dr. Stone believed and maintained no one took a second attack, and I have never seen one. I believe animal filth is the food of yellow fever, and that it *will not* spread in a clean city.

DENGUE COMPLICATED WITH YELLOW FEVER IN 1858.

This epidemic was complicated with dengue. Dr. McCraven says he knows very little of this strange disease as it occurred this year. "At some uncertain period of the fever, or during the convalescence, the patient would be attacked with deep-seated, excruciating pains, very similar to those of rheumatism, sometimes in the fingers and toes, sometimes in the arms or legs; in several cases they were general from the hips down, while the other parts of the body were exempt; in several the tibia or radius was the principal part complained of, and in one it was confined to the great toe, and in another the pains were universal from the neck to the feet, and so agonizing that the slightest motion was almost intolerable. They were very different from the pains which usually attend the first stage of yellow fever; more violent, more local, but occasionally, like rheumatism, migrating from one part to another. Toward the close of the epidemic I encountered a good many of these cases uncomplicated, most of them in persons who had, during previous epidemics, had yellow fever, and some in those convalescent from recent attacks. It then usually came on with chilliness, attended with thirst and the pains above described, but little fever followed; surface generally moist, and temperature normal. The pains continued from one to three days and gradually subsided."

DR. McCRAVEN'S TREATMENT OF DENGUE.

"The warm bath, quinine, anodynes, were the only remedies I found available. No case proved fatal, so far as I know."

Dr. McCraven believes "it is confined to yellow fever localities and prevails at the same season; often, as I have been informed, attacking the unacclimated when the acclimated are suffering under the latter."

YELLOW FEVER OF 1853.

As a continuation of the history of yellow fever in this State, we extract the following table from the *Bulletin* of this city:—

YELLOW FEVER EPIDEMICS IN GALVESTON, 1853, 1854, 1858, 1859, 1864.

		1853	1854	1858	1859	1864			1853	1854	1858	1859	1864
Aug.	9,	0	4	0	0	0	Oct.	5,	6	0	11	4	8
"	10,	0	0	0	0	0	"	6,	6	0	3	4	3
"	11,	0	6	0	0	0	"	7,	7	3	13	0	1
"	12,	0	3	0	0	0	"	8,	5	2	8	0	7
"	13,	0	7	0	0	0	"	9,	2	2	6	5	2
"	14,	0	1	0	0	0	"	10,	4	4	10	1	1
"	15,	0	2	0	0	0	"	11,	3	1	6	4	5
"	16,	1	5	0	0	0	"	12,	6	1	10	7	3
"	17,	0	1	0	0	0	"	13,	1	6	6	6	5
"	18,	1	3	0	0	0	"	14,	5	3	10	8	6
"	19,	2	1	0	0	0	"	15,	2	5	12	6	2
"	20,	0	4	0	0	0	"	16,	8	0	10	0	5
"	21,	3	7	0	0	0	"	17,	5	1	10	4	5
"	22,	0	5	0	0	0	"	18,	2	1	8	3	2
"	23,	0	7	0	0	0	"	19,	9	0	6	6	2
"	24,	1	4	0	0	0	"	20,	4	2	6	4	2
"	25,	2	4	0	0	0	"	21,	7	1	6	5	3
"	26,	0	6	0	0	0	"	22,	3	2	1	4	6
"	27,	1	7	1	0	0	"	23,	0	4	9	3	2
"	28,	3	3	1	0	0	"	24,	6	0	4	2	2
"	29,	2	9	0	0	0	"	25,	5	5	4	0	3
"	30,	5	9	0	0	0	"	26,	2	6	2	0	2
"	31,	1	5	0	0	0	"	27,	4	3	4	13	0
Sept.	1,	2	5	0	0	1	"	28,	7	7	7	5	4
"	2,	8	7	1	0	1	"	29,	2	4	5	4	2
"	3,	8	7	0	0	2	"	30,	1	2	2	5	0
"	4,	14	8	1	0	1	"	31,	3	1	2	5	0
"	5,	7	9	2	0	2	Nov.	1,	5	2	3	5	1
"	6,	9	17	1	0	0	"	2,	4	1	6	4	1
"	7,	4	9	4	0	0	"	3,	2	0	0	6	2
"	8,	8	15	5	0	3	"	4,	3	0	2	2	0
"	9,	7	13	1	0	2	"	5,	4	1	4	1	3
"	10,	9	14	2	0	1	"	6,	5	0	4	4	0
"	11,	9	11	4	0	2	"	7,	2	0	1	1	1
"	12,	18	14	5	0	2	"	8,	3	0	5	1	3
"	13,	9	13	2	0	0	"	9,	4	0	1	0	1
"	14,	14	8	1	0	5	"	10,	5	0	3	0	0
"	15,	7	8	8	0	3	"	11,	3	0	0	0	0
"	16,	12	10	1	0	4	"	12,	2	0	0	6	1
"	17,	11	7	5	1	5	"	13,	0	0	1	0	1
"	18,	13	4	1	1	3	"	14,	4	0	1	6	0
"	19,	15	9	0	0	3	"	15,	5	0	0	0	0
"	20,	11	3	4	0	8	"	16,	3	0	0	0	1
"	21,	9	4	3	0	12	"	17,	6	0	0	3	0
"	22,	10	2	4	0	11	"	18,	2	0	0	3	1
"	23,	3	3	5	1	11	"	19,	0	0	0	2	1
"	24,	17	2	4	0	14	"	20,	1	0	0	4	1
"	25,	15	3	8	3	5	"	21,	3	0	0	1	0
"	26,	9	3	7	3	13	"	22,	4	0	0	2	0
"	27,	9	5	6	3	3	"	23,	2	0	0	2	0
"	28,	14	1	8	1	8	"	24,	1	0	0	0	0
"	29,	7	5	6	3	5	"	25,	4	0	0	2	0
"	30,	8	4	5	0	8	"	26,	3	0	0	0	0
Oct.	1,	5	2	2	0	10	"	27,	0	0	0	0	0
"	2,	4	5	7	0	4	"	28,	1	0	0	2	0
"	3,	5	0	10	0	1	"	29,	0	0	0	1	0
"	4,	9	1	4	0	3	"	30,	0	0	0	3	0

Recapitulation of deaths during the epidemic of 1864: Second Texas Regiment, 31; Cook's Regiment, 21; Bradford's Regiment, 5; Elmore's Regiment, 16; Pyron's Regiment, 5; Hobby's Regiment, 2; Timmons' Regiment, 2; Terrill's Rigiment, 1; DeBray's Regiment, 1; Wilkes' Battery, 14; Dege's Battery, Sappers and Miners, 3; Marine Service, 4; Signal Corps, 1; Soldiers' Command, not reported, 4; Blockade Runners, 6; Citizens under 10 years, 63; Citizens over 10 years, 63; Negroes, 16; Grand total, 259.

P. S.—In the year 1853 sporadic cases of yellow fever occurred up to January 1st, 1854, but only two or three more deaths, not included in the above table.

From Flake's Bulletin of the 27th of November, 1864.

It will be perceived from the table that the great epidemic of 1853 commenced about the middle of August; the first death reported was on the 16th, Total number of deaths, during the epidemic, was: in August, 22; in September, 306; in October, 136; November, 81. Here the table ends, but the paper states that there were sporadic cases in January, 1854. In this table, which is copied from the sextons' reports, are included all cases, and about one-sixth should be off, as that is the usual amount of burials of these months when there are no epidemics, the whole amount being, during the four months, 545: one-sixth off leaves 444 as the number from yellow fever. Galveston then contained about five thousand inhabitants, and of these we suppose some three thousand had it; but it is a supposition, and I cannot find any record or reports of our physicians of this year. It spread that year to Richmond, Fort Bend County. Was very bad in Houston; seven physicians alone died with it in Houston. It was at Liverpool, Brazoria County, some four deaths out of six cases. Was bad at Hockley and Cypress, where more than half died. There were sporadic cases in various other places throughout the State, but it did not spread. This was, perhaps, the worst epidemic that ever occurred in the United States, and prevailed generally, with so many facts that lead to the general belief in its infectious character. As to how or when it reached Galveston I have no information. I had just settled in the country and was living at Sandy Point, Brazoria County, but did not see any cases, as I then believed; but since I have seen more and learned more of the disease, I believe I treated two cases, Col. O. Young and Boner Ryle, colored. After there was a severe frost I visited Houston and was there nearly a week, and while there, there were six deaths. A Mr. Hogan had returned to his father's and took it, and died. A judge, from Iowa, also died at the old capitol. The boy, Boner Ryle, I took with me had it after our return, as I now suppose, but I treated him at the time for bilious fever, and he recovered.

YELLOW FEVER OF 1854.

This year it appears to have commenced much earlier than in 1853, as we find reported on the 9th of August four deaths; this, judging from 1853, would indicate that it commenced about the middle of July. There were in August one hundred and three; in September, two hundred and twenty-two; October, seventy-six; November, four. Total, four hundred and five; taking off, as before, ninety, we have, from yellow fever, three hundred and fifteen, to about three thousand inhabitants who were liable to it. This was a large amount, considering that the year before there had been some three thousand who were exempt, from having had it the year before. This year it was generally believed to be more malignant than the preceding year. It did not spread in the country this year, nor was it bad in Houston.

YELLOW FEVER IN 1858.

We hear no more of yellow fever until 1858, four years, when we find the first case reported in the table the 27th of August, there being only two deaths in that month. In September we have one hundred and nine; October, two hundred and four; November, thirty-three; total, three hundred and forty-eight. Take off ninety for three months, and we have two hundred and fifty-eight deaths from yellow fever, out of a population of six thousand at that time, and of that number we may presume, from our former data, that four thousand were protected. Consequently we have two hundred and fifty-eight deaths out of two thousand inhabitants.

YELLOW FEVER IN 1859.

This year the first case reported in the table was on the 17th of September, and that month there were sixteen deaths—none reported in August; October, one hundred and eight; November, sixty-four; total, one hundred and eighty-eight; off ninety, and we have ninety-eight deaths from yellow fever, out of the number of increase of inhabitants and those that escaped the previous year.

YELLOW FEVER IN TEXAS, FROM 1859 TO 1864.

Again we have an exemption of five years in this city, but during that time it had occurred at Matagorda in 1862, where there were about five hundred inhabitants, and one hundred and twenty died. About one-half died who had it. It did not spread into the country, and it was never known to occur there before, and it has never been there since. It was believed to be imported by a blockade runner, which was, no doubt, true. In 1863 it occurred in Sabine, and some fourteen deaths occurred; a few cases were reported in Houston, but none here. It was also believed to be introduced into Sabine by blockade runners. This year it also prevailed at Brownsville and Corpus Christi, but few deaths occurred, so far as I can learn.

MY OWN PERSONAL EXPERIENCE IN YELLOW FEVER.

In 1844 I was a student of medicine, living at Raleigh, Tennessee. My uncle, B. F. Dowell, had been to New Orleans, and came to see us at Raleigh, stopping with my brother, Dr. Alep Dowell. He was sick when he arrived, and was treated by my brother as a bad case of bilious fever. On the sixth day he began to turn very yellow, and died on the eighth day. Passed no urine, and died comatose. My brother, who had lived in New Orleans when a young man, pronounced it a well-marked case of yellow fever. In 1848 I visited New Orleans, in April, on my way to Texas. On my return, in June, I visited the Charity Hospital with Prof. Brickell, who was a student in Philadelphia with me, and he was kind enough to show me two cases, the first that were brought to the hospital that year. One was very yellow, and the other was a dark yellow, with black, livid spots, almost spotted. Both cases were in articulo mortis, and died, and were reported in the New Orleans *Medical and Surgical Journal.* In 1853 I settled (in September) at Sandy Point, Brazoria County, forty-five miles west of Galveston. The yellow fever was then raging at Galveston and Houston, and I was afraid to visit either place. Col. Overton Young came through New Orleans and Galveston, from Georgia. In a few days he was taken with a high fever, and I treated him as a mild case of bilious fever; but as he had been exposed to the epidemic at New Orleans and Galveston, I treated him as if he were a case of yellow fever. He recovered, but turned slightly yellow in his eyes and along his neck—different from any case of bilious fever I had ever seen in the Mississippi bottom, where I had lived from 1837 to 1852, and practiced from 1846 to 1852, among the worst cases of congestive fever I had ever seen, and all forms of bilious fever that ever occurred. After several frosts in Brazoria, I went to Houston with a negro man named Boner, who went up to have a wagon repaired. He slept out with some of his friends; I stopped at Old Capitol Hotel. While there it turned very warm, and many new cases occurred, and three deaths. Mr. Hogan, who had returned after the frost, and a judge from Iowa, died at the hotel. I did not see him, but heard his cries. I attended his funeral in a Masonic procession, and at the grave the cemetery smelled terribly, almost unbearable. The cemetery was the old one, which was in stiff black clay, and the graves were filled up with black clods, which permitted the effluvia to pass up through them; some few graves were covered with sand to prevent its escape. I stayed a week, and one day had a severe headache and fever, with a vomiting spell; took some calomel and quinine, and was up the next day. On our return home Boner had the yellow fever, and I treated him as a case of bilious fever that might be yellow fever, and he recovered. Mr. Cecil and his family were visiting his father-in-law, a short distance from my plantation. After the frosts they returned to Galveston, where his wife and one child died from yellow fever. These cases show that it is dangerous to return to a locality where yellow fever has been epidemic for at least a month after all cases have recovered.

In June, 1863, I was sent to Galveston to take charge of the negro hospital, and that summer we had a general epidemic of dengue, and I had it in September. No case of yellow fever that year, though it was at Sabine, and had been in Matagorda in 1862. In 1864 I was placed in charge of Cook's regiment of heavy artillery, in addition to my duties in the negro hospital. Nothing unusual occurred and the health of the troops was excellent, until about the middle of August, when yellow fever broke out from a blockade runner (see Dr. Farner's letter to *The News*, for the manner of its introduction and spread).

From the experience I had up to this time, I was wholly unprepared to express a positive opinion on this disease, which was marked with so many peculiarities, so different from our malarial fever, with which I was familiar, having practiced for seventeen years in two of the most malarial districts in the United States, Mississippi and Brazos bottoms, in full practice, besides living in a doctor's shop at Raleigh and Germantown, Tennessee, for nine years, making pills and waiting on patients for all the doctors of each place. So I claimed to know as much of malarial fevers as anybody, having had many attacks of almost every variety myself. We said of this disease it was not malarial fever, and if it were not yellow fever, we knew it was different from anything we ever saw. The excitement was very great. Drs. H. L. R. and C. published a card saying it was not yellow fever. The army surgeons, Fisher, Francis, Otis, and myself, said it was yellow fever, at least something we had never treated before. Drs. Farner, Fredeman, Lancton, and W. R. Smith said it was yellow fever, and they were old practitioners in yellow fever. Dr. Ashbel Smith (then Colonel of the Second Texas regiment) was for a long time non-committal, but leaned to the belief that it was yellow fever. The controversy ran very high and was very bitter, though there were five or six cases of black vomit by the 1st of September. By this time I became fully assured of its nature, and positively declared it was yellow fever. There was great alarm and many soldiers were talking of deserting. It was then they threatened to court-martial me, and I believe they would have done so but for Dr. W. R. Smith and Lieut. Col. Manley, of my regiment, who had had the fever; he seconded my move to quarantine all the forts where the heavy artillery troops were stationed, and a strict quarantine was kept up until after several severe frosts, which entirely protected all the troops, even at Fort Scurvy, only two hundred yards from the city hospital. The troops were provisioned from the city by wagons sent into the quarantine grounds, the drivers of which were changed, and men from the fort carried in the provisions and drove back the wagons to the quarantine line, where they were taken in charge by the Quartermaster's drivers and driven back to the city. This was done daily until the close of the epidemic.

After the 6th of September all agreed that it was yellow fever, and the gentlemen came out in the *Bulletin* stating it was epidemic. General Hawes ordered the troops in the city down the Island, and sent prisoners to Millican, where it followed them, as the reports will show. I saw at least twenty cases before I had charge of any myself, and three cases of black vomit—one a soldier's wife, on Post Office street, between Twenty-second and Twenty-third, which was as well marked a case as I ever have seen; one a soldier Dr. Labadie speaks of in his report; another, a patient of Dr. Labadie's, which was afterward turned over to me because he would not admit it was yellow fever. These cases all died.

From the 4th I was very busy—had all I could do—treating patients in the Quartermaster's department and in families of the soldiers, but no case at the forts,

and I believe I did not have to go to the forts more than three times during the three months. Colonel Manley had an old man, sixty years of age, who had it. His tongue was red at the edges and black in the centre; very tender over pit of stomach. He hallooed and cried out—the first case of the kind I had seen. He could not tell us where it hurt him, though he was conscious until he died. I treated him with calomel and Dover's powders until his fever left him; after the fever left him I gave him quinine. His pulse was not more than 100 at the beginning of his fever, and after the fever left not over 60. This was the first case I saw in a negro that died, and the second to Boner, spoken of before. He had some yellowness in his eyes, and his skin was rough and injected. Several of Major Van Horten's children had the disease, and one was well over it when the baby, about six months old, took it. I came to see him a few hours before I took it myself, and found the fever gone but his head greatly affected; ordered cold water to his head and a hot bath. He got the bath but went into spasms, and Mrs. V. came for me in great haste about nine o'clock, a few minutes after I had taken my bed. I mention these two cases in children to show that the brain was much affected in this epidemic, and that many children had it, so many, that it was called at first the children's disease, it will be seen that one-half of those that died this year were children. Dr. W. R. Smith was sent for and treated this child, and he recovered; on this same street, Winne, between Twenty-fourth and Twenty-fifth, were quite a number of children sick; at this same time, at Mr. William Poole's, several died; one of Mr. Poole's children died on the second day, with black vomit; attended by Dr. Smith, who said it was the first case he had known of black vomit so soon. A few days before I was taken sick I visited, with Surgeon Fisher, at the Bolton House, between Twenty-second and Twenty-third streets, on avenue M, Col. Bell, Captain McAlpen, and another soldier whose name I have forgotten, who all had taken the fever and were sick in the same room. Dr. Fisher was following Dr. Labadie's treatment—chlorine mixture, hot teas, and warm blankets; in other words, the sweating plan, with Dr. Labadie's chlorine mixture. We visited them twice a day. The three men were cheerful and hopeful, but their tongues were all black-coated, skin injected, eyes red and suffused. I insisted, the morning of the 13th, on a change from the chlorine mixture to Dr. W. R. Smith's powders, which I had seen him give with such good effect; I had had several of Dr. Labadie's patients just in this stage turned over to me, and had used these powders with the happiest effects; but Fisher would continue this treatment, and I left him fearing greatly the results. The next morning Fisher was taken himself, and Dr. W. R. Smith took charge of these cases and treated them with his powders, which I give here:—

℞. Hyd. ch. mitis,
Opii et ipecac pul.,
Quiniæ sulphatis, āā gr.ix. M.

Fiat chart No. 3.
Sig.—One every two hours.

All these cases recovered, but I really believe all would have died but for the change in the treatment. At this time, Surgeon F. M. Hall, of Mann's regiment, had the disease, and about the time he had gotten up, his son took it, and I treated him for yellow fever, though Drs. Hall, Campbell and Francis did not believe it was yellow fever, nor do I believe Dr. Hall (now living at Bryan) believes his son or himself had yellow fever then; but, in 1873, his wife had it at Bryan, and died, and I believe another member of his family. He sent for me while I was at Calvert, but

I could not go, for every hour was taken up—no less than twenty patients to see every day. See case 3, Johnny Hall, in report of cases. Among my first cases was Mr. Johnson, case 2, which is reported in full. He, as will be seen, turned very yellow before I saw him, and it was thought by Dr. Goode to be jaundice, but any one well versed in the symptoms will see at once that this was a genuine case of yellow fever, as his urine was perfectly clear. Edwin Brock (Case 1), I have given; his was a death from black vomit, and no doubt from eating butter and toast; he had not a sign of yellowness, but even to the time his fever left he looked more like a case of measles before the eruption comes out. After his fever left his skin was cold until fever returned, and with it black vomit. This was the first case I had then seen die from black vomit without turning slightly yellow. Surgeon Fisher was taken on the morning of the 14th of September, and the Chaplain of the Post, Baldwin; both were at Mrs. Rody Thompson's, and after I had made my rounds in the morning I went to see them. Both were in the same room; Dr. Fisher was sleeping; I did not wake him up, but felt his pulse; it was bounding, and at least 130, the highest pulse I had seen. Rev. Mr. Baldwin was about the same; he complained much of his head. Great drops of sweat were over both of them, and Baldwin was somewhat confused in his mind. I told Mrs. Thompson and the nurses they were too hot, and the covers should be taken off, but Mrs. T. said that was the doctors' direction, and she was giving them hot orange-leaf tea. I said well, if it's the doctors' direction, follow it strictly; they ought to know; but I would not think any one could live in such a rage. I did not see Fisher any more. Baldwin recovered, and is living yet. I had seen all these cases, and two hours before night I called at the negro hospital to see two patients; the steward, Mr. Robert Watkin, had been very bad; had relapsed two or three times; was yellow and much emaciated; looked as if he had had dysentery, and his bowels were troubling him. I recommended prepared chalk and Dover's powders; he got well, studied medicine, and graduated at the Galveston Medical College. While at the hospital I drank some coffee, which did not agree with me, and I belched it up. See case 4. Fisher died while I was sick, and the nurses told me *he was all right;* I did not know he was dead until I got up, and read his death in the *Bulletin.* While I was sick a great many died, about thirty in all, before they would let me read. I was not really fit for duty until after Christmas, as will be seen, but as soon as I could go out I visited all the cases of my regiment, as Dr. Rugely, my assistant, was absent at Sabine, I believe. It will be seen that my regiment lost twenty-one; only three out of these twenty-one were treated by me. Lieutenant Madden relapsed on 30th day of December, and died January 1st; see case. I visited Francis several times, but took no responsibility of his case. He was dreadfully frightened before he was taken, and I advised him to get a furlough, but his pride kept him, and he died. Dr. Otis, of the Signal Corps, stayed to assist, and he took the disease and died. He sent for me after he had black vomit and was spotted yellow, but perfectly conscious. When he had vomited up more than a pint of pure black vomit, he asked me what it was. I told him black vomit; he said "that is what I call it," having reference to our severe disputes about it at the commencement of the epidemic.

It will be seen from the table that all the regiments lost some cases, but careful notice will show that they died in about the same proportion in all the regiments, except the First and the batteries. The First was quartered in the centre of the city, and became completely infected before they were sent out of the city, six miles down the Island to a hospital established on the beach; but I learned that only six cases had

it after they left the city, showing plainly that they had the disease in their systems before being moved. They were not quartered close together, but wide apart. Wilkes' battery suffered worse than any. They were quartered on Market street, near Mr. Allen's (called Marble Allen), who treated most of them, and used cold baths and wet sheets, until there was an order to stop it, or nearly all would have died. So many surgeons were sick, they recalled Surgeon Randall and put him in charge of the hospital down the Island, and Dr. McMurry, of Sabine, who had treated it the year before at Sabine. One day when I was down there he was very sick, and the nurses disliked him so much that one told the other to pull the cover off of him and let him die. This shows that all believe to be uncovered is very bad, and there is no one thing of more serious import than to be uncovered or subject to a draft in the fever stage of this disease. There was one case of black vomit in this hospital that recovered after throwing it up seven days. Just before I was taken sick, the old Tremont Hotel was fitted up for a hospital for the patients in the city, and I was attending it. I had men taken out of warm beds and in a comfortable sweat, and carried to this hospital, who were made worse, and one at least died, who I shall ever believe *would* have recovered if he had been treated in quarters. I never could get him into a perspiration again, and he could not lie still, but turned and tossed until he died. I then gave orders for none to be permitted to undress or go to bed before coming to the hospital. I have seen many brought to the city hospital in the same condition, and they are always worse or die. So I make it an invariable rule, if patients are at all comfortable, not to move them; if they have undressed, and have plenty of bed-clothing, I do not allow a particle of air to get to the body; and if the bed is changed, the sheets must be made as warm as possible before the patient is put in them. It has been seen that I *do not* believe in smothering up a patient or sweating him to death with blankets and hot teas, but they *must be kept moist*, or they cannot lie still. It is most undoubtedly a zymotic disease, and if this fermentation is checked by drafts or cold air, or by any means, it kills.

In examining the number of deaths in each regiment, it will be found that only a small number died from each command. This was owing to the most of the troops being quartered out of the city; only the men in the Quartermaster's department and the surgeons had quarters in town. Drs. Throckmorton and Haley, of Hobby's regiment, thought they had had the disease before, but both had it very bad, and turned yellow. They both had been in other and greater epidemics, and had not had the least symptoms of the disease, so it is more than presumable they did not have it before. I saw several cases at the Port Hospital that were well marked; while I was there, one day, a case was brought in, perfectly yellow and much debilitated, and Dr. Nagle prescribed croton oil; of course, the man died. This was prescribed owing to his yellowness and constipation, and the belief that he was exceedingly bilious. Purgatives, as a general thing, were injurious, and only laxatives, to just move the bowels, were best. Where active purgatives were used the patients were more apt to die of hemorrhages and black vomit. It is generally the belief that cold weather is injurious to patients. This has not been the case in my practice, especially in 1864, for I treated a soldier in a room without fire, while there were icicles hanging from the roof, and I treated several other soldiers who recovered. Miss Della Shackelford had it while there was a sleet on the ground. She suffered from hemorrhage from the nose, but no other bad symptom, and recovered perfectly. I took some blood from this young lady's nose, and put it on a plate of glass, and examined it with a microscope; I saw in it black flakes, and the globules of blood

quite changed and broken up. This led me to believe that the black specks were like the pigment niger of the eye; so I took some pigment and mixed it with mucilage, at my office, and put it on a plate similar to that containing the blood, and also some animal charcoal on another, and examined all these specimens with the same power; the black particles looked the same and I believe were the same. I kept these preparations for several years, showing them to students and physicians at various times, and they all concurred in the belief that they were the same. I tried this experiment again in 1867, with the same results. Mrs. Shackelford had the disease after her daughter, but treated herself—taking simple purgatives (patent pills), remaining in bed—and recovered. Negro boy at the same house had it, and recovered.

As soon as I got up, so that I could practice, I was called to Mrs. Muller's little girl, on Post Office street, in the same block with Edwin Brock; this was a similar case, in all respects, to his. I did not let her eat butter and toast, and she got well. I treated several pregnant females, and all recovered except one, who miscarried with a child of six months, and died of hemorrhage. She was very yellow before she died. She had three boys sick with the disease at the same time, near my office, on the south side of Post Office street; they were carefully nursed by Mr. Albert Ball and others; one of the boys also died, turning very yellow before death. They were the wife and children of a soldier, but he was away in another command; their bedding was poor and scant, and they could not be made comfortable where they were.

Nearly every lady I treated that was not pregnant had a hemorrhage from the womb, whether it was their regular time or not, and some suffered nervous symptoms before it came on, but none died; and when the flow came on these nervous symptoms ceased. This I also noticed in all our epidemics of dengue, as will be seen. It ceased without any treatment, and nothing was given to relieve it but a little brandy and water, to quiet the nerves, or valerian.

There were no post-mortems made this year that I recollect of. I did not make any myself. In 1863, after I had had dengue and while I was convalescent, I found, at Captain Lufkin's, a copy of the *Medico-Chirurgical Review*, and in it was a review of Blair and the epidemics of '50, '51, '52, '53, and '54 in the West Indies. This article and Dr. W. R. Smith's practice were my guide in treatment, and my success was wonderful in comparison with others. I must also refer to much good advice from the writings of Dr. Morton Dowler, of New Orleans. He was the first author who favored the refrigerant treatment in preference to hot teas and hot blankets; giving plenty of cold ice water and even lumps of ice. In this epidemic we had no ice. We were blockaded and could not get it, and the best we could get was good cistern water. This, and the almost universal plan of treating the disease with hot teas, blankets, and baths, I think was the cause of the great mortality in children. Hence the pulse and temperature were so high. Many mothers would not give their children even cistern water, and Mr. Dennis Neil, when he stayed with me, would not give me more than a third of a glass at a time, and I got very restless and thirsty before day. When he left the Rev. Mr. McNair called to see me, at daylight, and gave me a full glass, which I drank with more zest than I ever drank in my life, and I broke out into a fine perspiration; my head became easy, and I soon fell asleep, which I had not done before during the entire night, and I believe the restraint from water was the cause of my trouble. Since that time I have not failed to give my patients all the water they want. But, as I have remarked before, when one has been restrained they should not be allowed all they will drink at

once, or it will do harm, but give it at regular intervals and often, until they get plenty. If no restraint is imposed from the first, no one will hurt themselves, and by so doing, many accidents are avoided; restrain, and they will slip out of bed and drink too much, in spite of the careful watching of the nurse. Plenty of cold water will keep up the perspiration, if patient is kept in bed and carefully covered; but should the perspiration stop, by getting up, being uncovered—or from any cause—a cup of warm orange-leaf tea will usually start it, and if this fails, then the feet should be put into mustard bath under cover. If this fails, the powders mentioned so often, of calomel, Dover's powder, and quinine, should be given, and these never fail me; they usually put the patient to sleep, and he becomes moist all over and rests easy. These powders became known as 3 and 3 powders, and were Dr. W. R. Smith's favorite prescription, and when not continued to ptyalism, or after the fever left, I never saw them do harm, and many times—*hundreds of times*—I believe they alone saved my patient. See report of cases for special application. The calomel prevents uræmia, and hence, delirium; the potash in Dover's powders acts upon the skin and kidneys; the opium relieves pain and irritation, and predisposes to sleep; the ipecac acts on the skin and mucous membrane, and prevents hemorrhages. It is not sufficient to produce nausea and vomiting, but should it do so, leave out the ipecac, and give potash and opium in same proportion. The quinine is useful in all malarial districts, and prevents intermissions or remissions in the febrile stage, which is always bad. The fever should be regular and continued—gradually declining from the first day, until it ceases; it is not apt to rise again if it last for three days, but if it intermits or ceases before the third day, I look out for a return, and the most unfavorable results, and it is likely to remain in this irregular manner until the fifth or last day, and end in hemorrhage or black vomit. Quinine has never acted well with me in the cold stage, as before stated. When given, it depresses the pulse, which is usually low after the fever leaves, about sixty, and even as low as thirty-two. This condition needs brandy, and when patient is or has been subject to intermittents, I give the following:—

℞. Tinc. cinchonæ,
Tinc. colombonis,
Tinc. gentianæ, āā ℥ij. M.

Sig.—Tablespoonful in a little water every two hours, until four doses are taken each day.

This has generally acted well. When in this stage there is a tendency to hemorrhage, I give this mixture, and an additional two ounces of tincture ferri chloridi, and if there is suppression of urine, instead of iron I give the tincture of cubebs, two ounces, and continue it until six doses are taken. This was the general plan I pursued in the year 1864, and the results were better than others, but it is impossible for me to tell the number treated during this epidemic; I suppose about three hundred, and I believe I have mentioned all the deaths except those turned over to me by other physicians and consultations, in all six: Edwin Brock, boy at Mr. McMahan's; soldier, on first of January, at South Battery; woman and child on Post Office street; negro man at Colonel Manley's. Lieut. Madden I did not see until he had black vomit. Several suffered from protracted hemorrhage from the nose, and I had to plug the nose with cotton saturated with tannin, and the prescription before mentioned internally. These cases were *piebald*—yellow streaks and white lines, and then livid spots here and there. This mixed color I have never seen in any other disease; I wish I had a painting or chromo to show this peculiarity, for I have seen it many

times since. The skin is not so dark as that shown in chromo with yellow skin and hemorrhage, copied from Blair.

Quarantine was established after the surrender, by the U. S. Post Commander, in 1865, and Dr. C. H. McGill, now of Marshall, Texas, was appointed, by Dr. White, Medical Director, as quarantine surgeon. We did not see or hear of a case in Texas that year. In 1866, it will be seen by the table, there were twelve cases and one death; all treated by me in the City Hospital. All but two were sailors. The only death was attended with black vomit, and I made a post-mortem (see case 1, in table of post-mortems made by me). Two were from the city; one a porter at Washington hotel (mentioned at page 14), who had not been out of the city; the other, a negro from Captain McCloskey's, who came from Alabama, through Mobile and New Orleans. Both recovered and returned to the city. The fever did not spread, nor was there another case in the State that year, that I have heard of.

THE GREAT EPIDEMIC OF 1867.

The spring of 1867 was very dry, and Hitchcock's Bayou was dry before we had any cases, which I have mentioned in my climatology of Galveston, page 53. This bayou nearly surrounded the Waters House and the Bolton House, where Col. Bell and Capt. McAlpen had the fever, before mentioned; I remember riding across the centre and deepest part of the bayou while I was visiting them; in ordinary wet weather this required swimming; it became full in 1864, before the close of the epidemic, and came up to Broad and Twenty-first streets; I remember treating a case of yellow fever in the little house still standing on the northeast corner, and I had to ride up to the banquette, which was filled up with oyster shells, to get off my horse. This bayou continued still higher up Twenty-first street, and there was quite a pool of water on and between this and Twenty-second streets. These, as I said, have been filled up, but the places are still too low, and whole lots are now, at times, covered with water, but it runs off in a few days. I give a table of the meteorology of this year, kept by me at the City Hospital, except the week all my students and assistant surgeons were sick (see table). I before mentioned that this bayou dried up every year we had yellow fever, since I lived in Galveston (see page 54). When it dried up, it produced a very disgusting odor, from dead crabs, crawfish, minnows, snails, worms, weeds, etc. When this was dry similar places were also dry, and smelled almost as bad. Noticing this fact led me to believe that *animal filth was the food of the germ of yellow fever*, or cause. Whatever it may be, all the reports referred to give similar conditions where the fever has prevailed; but we will have more to say of this hereafter.

General Griffin was in command of the U. S. troops on the Island this year, and he or Dr. Taylor, his medical director, appointed Dr. R. K. Smith quarantine surgeon, but how efficient the quarantine was I cannot say. However, early in June, as will be seen by Dr. Reuss' report of the epidemic at Indianola, the yellow fever was in that city, and from there we received the case that died in Galveston, of which Dr. Welch speaks. But, as Dr. Welch remarks, we had it in the City Hospital on the 22d. I was in charge, and had not merely hearsay reports of yellow fever, but when four cases came in from one ship from Key West, all of the same character, and all with symptoms of yellow fever in the first stage, I remarked to the

assistant surgeons and students that if there was a case of yellow fever about, then I would call these yellow fever ; and they turned out to be genuine cases, as will be seen by the notes I made in the *Galveston Medical Journal*, which I was then publishing, for August, 1867, written on the 23d of July, which we copy :—

"About the 1st of July we had a case of yellow fever in the City Hospital, and we have had from four to ten cases at a time for the last two weeks—two deaths from black vomit, and one which indicated it in the colon and intestines generally. In all these cases the spleen was softened, and easily torn, being a reddish disorganized mass. Stomach much injected, with spots of ecchymosis. Liver natural in one, and gall bladder with little bile. The other two much enlarged, and gall bladder full, distended with vicious, black bile. In first case bladder full of urine, in other cases only a few ounces. The first case was not suspected of being yellow fever, as he had had two distinct paroxysms of fever. I was giving him quinine to keep off the third, when he commenced to vomit black matter, and did so until he died. The second case was in hospital for an injury below his ribs on the right side, which had produced a severe contusion. I did not see him until he commenced to throw up black vomit, as I was sick when he was taken with the fever, and he did not receive any treatment but for the wound until he commenced to vomit. The third and last case died this morning, July 23 ; was very yellow when he came into the hospital, and continued so until he was buried. He passed a good deal of black matter through the bowels, and vomited a dark greenish matter for twenty-four hours before he died. He was partially delirious, and moaned and screamed during that time in a pitiful manner. The omentum was very black and injected; free from serum ; also the intestines were dry, and the colon filled with a dark reddish matter. There have been, in all, twenty-four cases diagnosed yellow fever. All have recovered or are convalescent except these three.

"There have been several cases in the U. S. Hospital, and some three deaths, and cases are still occurring. As to the history of the disease in Texas, I would refer the reader to the May number of last year, and to the following from the *Civilian and Gazette*, of July 6th inst., as to the treatment and character of the disease. So far, I only remark that there are a much larger proportion of yellow cases, there being seven in the twenty-four. The disease yields readily to judicious treatment. It has occurred at least one month earlier this year than usual. It is, no doubt, epidemic at Indianola, and will be in all our cities along the coast before winter.

"Are we to have an epidemic? seems to be the main question in Galveston just now. Those who have never seen yellow fever are about as well able to answer as those who have been a lifetime here and seen it in all its phases. We have seldom known a season in which cases did not occur exhibiting characteristics of yellow fever; yet in thirty years we have had but eight epidemics, occurring without any regularity as to intervals of time or appreciable regard to wet or dry seasons. The earliest appearance of cases in epidemic seasons was July 5, 1844, and the disease became epidemic after the 1st of October, in 1846. The first epidemic occurred in 1839, a few cases in 1838—(Ashbel Smith.)

"So far as the statistics of mortality from the disease, and the periods of its recurrence here are concerned, they are, as nearly as records have been preserved, as follows—see table, page 187—each visitation lasting about three months, except that of 1844, which was unusually malignant, and seemed to exhaust the whole population liable to attack in about six weeks.

"The number of recoveries cannot be so accurately stated, but the general estimate is that one person dies, on an average, to between three or four cases. In the early epidemics but few children or negroes, and comparatively, but few ladies, died. Since then the distinction has been less marked.

"The longest intervals between epidemics was from 1847 to 1853, six years. The severe epidemic of

1853 was followed by one almost as severe in 1854, the first case in which fever occurred two years in succession.

"We have always reported promptly the first appearance of yellow fever in our midst, as those who wish to leave the city in order to avoid it should not wait until there is danger that they have contracted the disease. It is progressive, and the number of cases usually increases until the epidemic is about half over, and then gradually diminishes, many of the last cases being among returned fugitives who get over their fears and return before the air has become pure. As to remedies and modes of treatment, we can only repeat what we have often said, that we do not believe there is in general use any better or safer mode for its treatment than there was a hundred years ago. Good physicians and good nurses save many lives; but it is impossible, and ever will be, for all patients to have these; and quacks and injudicious or neglectful attendants, and imprudence in the sick and convalescent, cause more deaths than the judicious prevent.

"The idea that yellow fever will ever wholly disappear has but little foundation. We do not believe that there is a spot on the coast of the Gulf of Mexico, or in any of the country near the coast, which is not liable to visitations of yellow fever. The only compensation this city has found for these visitations is the extreme healthfulness at other times, and particularly for a year after the fever has prevailed. It seems to forestall every other disease, and pick out in advance all who would have died from other causes, including a large number of those whose systems have been undermined by intemperance. As a general rule, however, the disease respects no one save such as have already had it; and they are not always spared.

"The health of the city was never better, and its sanitary condition is better than it ever was. Yellow fever may not become epidemic in the city, as we had twelve cases last year without any in the city. But every one must have observed the resemblance of this summer to that of 1853, preceding that great epidemic. The rains have been the same, and the disease has been quite prevalent in the West Indies all the winter."

Post Surgeon Charles Rowe, M. D., Assistant Surgeon United States Army, was in charge of the Post Hospital; he was an intimate and particular friend of mine, and visited the City Hospital with me, and I with him visited the Post Hospital every day, noting the cases. Surgeon Rowe was not familiar with yellow fever, nor, I may say, were any of the army surgeons then on the Island, not even the quarantine surgeon, Dr. R. K. Smith; in part, he would answer to Dr. Matchett's description of a quarantine surgeon. Dr. Mintzer, now of Philadelphia, of the Freedmen's Bureau, was an early convert to its being yellow fever, and urged General Griffin to remove the troops and the Post Hospital out of the city; this he refused to do, and ridiculed him, and finally secured his resignation, which he thinks saved his life, as all the others (except Dr. Smith) died; as the sequel will show.

The first case of death in the City Hospital was not suspected of being yellow fever, as we have seen, but we had several others yellow. This was the patient we had such a quarrel over, mentioned on page 27; at this post-mortem were Drs. Welch, D. Port Smyth, J. H. Webb, John Howell, W. H. Gantt, R. H. Horner, Supervising Surgeon C. W. Rowe, M. Campbell, and C. H. McGill. I shall not repeat what I have said, but McGill, who had had the disease at Richmond, in 1853, afterward said he really (at that time), did not believe it was yellow fever, but was sure of it after the epidemic was well developed. This was before Muller's death, spoken of by Dr. Welch in his report of his death on the 3d of July. A few days after this, Dr. Haden called me to see a lady on Market street, who was vomiting up a white ropy mucus, which often precedes black vomit. She was wet with perspiration, and, as I thought, dying, and she did die. She was spotted—black spots about the size of a small pea, supposed to be from mosquito bites, which they probably were, but the blood was so hemorrhagic it spread. About this time I was called to see Mr. W. Patch's family, corner of Post Office and 20th street, northwest side;

he was a cabinet maker, and lately from New York; his family were Irish by birth, and had never had a fever in their lives. Mr. Patch lived in the same block in which Muller died, and was attacked eight days after Muller's death. Patch, his wife, and wife's sister, took the fever the same evening, at 9 o'clock. He sent for me; his fever was very high; face almost red; pulse full and strong, and he said he had had a slight chill before his fever arose; his wife and sister-in-law were about the same. I gave Patch the 3 and 3 powders so often mentioned, to wit:—

℞. Calomel,
Dover's powder,
Quinine, āā gr.ix. M.
Fiat chart. No. 3.
Sig.—One every three hours.

The fever was not so high in the wife or sister-in-law, and I only gave them some castor-oil, to move the bowels, pronouncing them all genuine yellow fever. There were two other young men working in the same shop, who slept in the room above, and ate with the Patch family. One of them went off, and got some friends, and Dr. Haden, who pronounced the fever not yellow fever. Haden was non-committal, but came over to see me, and asked me if it was yellow fever. I told him it was, undoubtedly. His reply was, "*Pshaw! you have got yellow fever on the brain.*" I said before a week you will have it on the brain too. He then asked me why I thought it yellow fever. I replied, because three persons in the same house had taken it within four hours of each other, and I never knew bilious fever to affect three persons on the same day so near together, and they had never had a fever before; came from New York, where there is no bilious fever, and have been in this city and nowhere else. And again, their faces were red and flushed, more like scarlet fever than bilious fever, but no grown persons ever have scarlet fever so bad. Their great nervousness, also, was a diagnostic symptom. This, he replied, was fear. But this nervousness is greater in children who do not know what is the matter with them. In reference to so many taking it at once, I instanced Dr. Fisher, Rev. Mr. Baldwin, and myself, in 1864. We visited all the yellow fever cases together. Baldwin and Fisher took it in the morning, and I in the evening. He then said he would wait until morning. One of the young men commenced to drink hard to keep it off, but in two or three days he was taken down, and the other left for San Antonio. The young man who began to drink took black vomit on the fourth day, and died on the fifth. The other had it in San Antonio. I heard no one dispute its being yellow fever after this. Surgeon Taylor, Medical Director, went to Indianola, and from there to New Orleans, to see if it was yellow fever. He came back and took the disease, but before he was taken sick he had had me employed as visiting surgeon to the post hospital to assist Assistant Surgeon Rowe. It was then more or less all over the city, and all the doctors were busy. The number of new cases was increasing in the city and post hospitals.

After the 23d of July I was so busy I made no examination of the dead bodies, nor had I time to take records of pulse, temperature or urine, but I gave my apparatus up to Surgeon Adams, who took quite a number of observations, which were lost by his death. My young men at the hospital also took some, but owing to the press of business they were too imperfectly taken to be of any practical use. I only remember the urine was albuminous in about three or four cases; pulse usually the highest on the first day, declined until the third or fifth, when it went off, unless

the patient was kept too hot, when it usually ran to the fifth day. Pulse rarely above 120 the first day, and gradually declined to the end, and even fell in bad cases until perfect reaction was restored. When it rose in number after the fever left, the patient was considered in a critical situation, and was closely watched, and each case treated according to indications.

About the 28th of July Surgeon Taylor was taken, at Exchange Hotel. Drs. Rowe and Adams attended him until he was very bad, and then they called me in. At my second visit he was much oppressed, and we were holding him up to give him some medicine, when the lightning struck the steeple of the Presbyterian Church in an adjoining lot, making a bright flash and a loud report, which killed him instantly as if it had actually struck him. All patients suffer more during thunder showers; I have watched their effects ever since. Surgeon Adams was taken in a few days and died. Dr. R. K. Smith was also taken, and Dr. Goodall treated him; he drank freely of champagne, but turned very yellow and lingered for a long time. One of his sons had died with black vomit, and his wife and daughter were both sick, and Dr. G. came for me in consultation. Mrs. S. got up in a few days and appeared quite well, but her nurse left her, and Miss Rebecca's nurse was taken down, and Mrs. S. had everything to do, and in a few days relapsed and died in spite of all I could do. Miss R. was very sick for a week, every day threatened with black vomit, which was kept in check by the creasote mixture, but her catamenia returned, and she became very nervous and could not sleep. I called Dr. Rowe to see her with me, and he suggested ten grain doses of valerianate of zinc, which acted well; I have used it often since, with the best results.

Rowe was taken down the next day after his visit to Miss Smith. Miss Smith finally recovered, but her nurse relapsed and died. Mr. Kelly, a soldier, sent as a nurse, took it here, and I sent him to the City Hospital. When he got there he was so delirious they would not take him in, as he cursed and went on so, that the steward thought him drunk, and he stayed out all night, but could not tell where. He recovered. The last of August, too, the disease was very fatal, especially among our doctors. I wrote and published the following in my journal:—

The yellow fever epidemic still rages in this city. This has been a very fatal month, and thousands have had the disease, and about seven hundred citizens have died and twenty-four U. S. troops. Many are still down with the disease. Several of our physicians, viz.: Drs. B. F. Clarke, R. G. Salmon, Surgeon Taylor, Medical Director of the State of Texas, Dr. Ulrich, Homœopathist, and Dr. Barnett, have died; Drs. W. H. Gantt, R. H. Hanna, Asst. Surg. C. R. Rowe, Asst. Surgeon Samuel Adams, Drs. Ernest Brake, Daniels and Tompkins, are now down with the fever; Drs. Watts, Garrett, Spann, Davis, C. R. Wilkerson and R. K. Smith, have had it and recovered; Drs. Chas. Trueheart and Henry Shearer have had light attacks, supposed to be second attacks, as they thought they had had the disease before. We do not believe in second attacks, as we have said before. We think they were sick from fatigue and exposure, and really did not have yellow fever, as such cases do not die.

So far, I believe, at least one in every five of those taken have died. So far as my own notes go and the City Hospital shows, I will state: City Hospital treated in all, patients and employees, 311, of these 73 have died; at U. S. Post Hospital, 164 have been treated, 27 have died; in my private practice I have treated 110 cases, and 8 have died; among these 26 children, and no deaths. Two recovered from black vomit, and seven grown persons have recovered, in all nine. I saw two chil-

dren in articulo mortis, and I visited, in consultation with other physicians, twenty-two cases; of these six have died.

The type of the disease is the same as given in the August number. Many cases have turned yellow, about one in seven; about half of the deaths were from black vomit, and the others from congestion of the brain, suppression of urine and hemorrhage.

But few children or negroes have died—only two out of thirty in all I treated, of negroes. One employee of the hospital (the laundress) died, out of twenty-one employees during the month, all except the matron having had or now have the disease.

The treatment in the City and U. S. Hospitals has been the same, as I have attended both during the month, as prescribing physician, and I have pursued the same plan in private practice. The general plan has been to let the patients take as much ice lemonade or water as they wish, to put them in a mustard foot bath, and give them a dose of castor oil or solution of citrate of magnesia, or any mild purgative; this is to be done in the cold stage, or in the first twelve hours. After that time these are omitted, as by this time the fever is usually at its height, and if the bowels have been moved I have given the following:—

R. Hyd. ch. mitis,
Opii et ipecac pul.,
Quiniæ sulphatis, āā grs ix. M.
Fiat chart. No. 3.
Sig.—One every three hours.

If the fever is very high and skin dry, I give ten drops of tinct. of aconite, and other sudorifics, according to circumstances. I also vary the proportions according to the case, and do not adopt any routine practice. These powders repeated will break the fever, but if they do not I still repeat them, and I will say that when they have failed everything else fails. I cup when there is a determination to the head or stomach; and I have bled four patients—one in articulo mortis, and one man twice; his fever did not break, and he died; the other two recovered—all bad cases. After the fever leaves I throw off all covering except a sheet, or one blanket, which I prefer, and give plenty of beef tea in preference to anything else. If there is vomiting after the fever leaves, I blister the stomach at once and give the following, to prevent black vomit:—

R. Brandy, āā ℥j
Water, gtt.x
Creasote, gr.ss.
Morphiæ,
Sig.—Tablespoonful every two hours.

If this failed everything else I have tried failed too; and with it I have cured all the nine cases mentioned. I have given the oxalate of cerium, in from five to ten grains, with good effect, and I believe it to be a most excellent remedy in all cases, both with or without fever, where there is vomiting. I have given the valerianate of zinc, to produce sleep and allay restlessness, with the most happy effect, where the patient tolerated the valerianate. I keep my patients at all times comfortable, neither too hot nor cold; never let them get hungry or faint. I give pure brandy in preference to anything else, and an alkali when the stomach is acid. Prepared chalk is my favorite. I eschew wines of all kinds, porter and ale, except to the

usually intemperate, but much prefer gin or brandy to all others, diluted to the patient's strength and taste. I prefer gin to brandy where the urine is scant or suppressed. Many patients would sink after the fever went off, without a timely dose of brandy, and unless the brain is congested it will promptly produce reaction.

I condemn the hot bottles, orange-leaf tea, and hot drinks in general, and the application to the head of ice or cold water when the patient sweats. Allow fresh air, plenty, but no draft; rooms must be well aired; no getting up to mugs, but use mugs in bed and bed-pans; no exercise or sitting up, for at least five days after all bad symptoms leave patient. Second day after fever leaves, the sheets may be changed in bed, and patient lying down, sponged off with brandy and warm water. No one should get up and fatigue themselves or eat too much. Be prudent in all things for a month, and by all means avoid a relapse, as they are nearly always fatal, and the best treatment for relapse cases is none at all. Always keep patient in bed and comfortable, and counteract anything that may have caused a relapse. Plenty of cold water and nourishment as remedies, which in all cases should be animal food instead of vegetable, and black meats instead of white, or rather fibrinous than albuminous.

This, so far, has been my course, and I give the statistical results. I endeavor to see my patients at least twice each twenty-four hours, and three times if possible, as the disease is the most changeable and insidious I have ever treated. I say nothing of diagnosis, as good descriptions are in any book on practice, and this epidemic is no exception nor any worse than others described by all authors I have read. I have used all the other remedies recommended, but they have disappointed me.

Drs. W. H. Gantt, R. A. Hanna, Assistant Surgeon Rowe, Assistant Surgeon Samuel Adams, and Dr. Ernest Brake, died, of those sick the 1st of September. There is a full report of this disease in the Surgeon General's report of yellow fever at Galveston in 1867, made by Dr. Bacon, but his statistics are not correct as to the Post Hospital or St. Mary's, as the mortality in St. Mary's, as I know, was over fifty per cent.; they did not report the first cases as yellow fever, but as congestion of the brain and stomach, while at Post Hospital the proportion of cases to deaths was much greater, as many mild cases were put down as remittent or intermittent that were undoubtedly cases of yellow fever, but as I did not put the disease on the card, the steward and attending house surgeon overruled my diagnosis.

The disease continued to rage and increase daily in mortality, until the 18th of September, when it reached its height, the daily mortality being thirty-four. Of the doctors who were sick on the 1st of September, in addition to those mentioned above, Drs. Alexander and Barnett, died. Dr. Barnett was a patient in the City Hospital. He had consumption—so did Alexander—and died on the third day after his attack, soon after the fever left him. He was livid in spots, as if the blood had settled under the epidermis. I do not remember a single case where a confirmed phthisical case recovered. Dr. Hanna had it lightly at first, and we did not continue the three and three powders long enough, as Dr. C. H. Wilkerson was salivated, and for fear of salivating Dr. Hanna, we did not give the powders on the third day; his fever rose and he died with black vomit. He was very much afraid of the disease, and went to confession and obtained absolution the week before he was taken sick. My nephew, Dr. G. A. Dowell, had it also; all three in the same room. At the time Dr. Hanna died, my nephew became much alarmed and cried out almost continually. When I would ask him what was the matter and what hurt him, he would say uncle I am dying. I would feel his pulse

and find it to beat strong and regularly, but only sixty. He would halloo so loud, I was afraid he would frighten the patients in the hospital, which at this time was full, one hundred and sixty or over. I would tell him he was strong or he would not halloo so loud. I am losing my breath. He hallooed so loud, I would say, no wonder; but nothing would satisfy him. He continued to halloo the whole evening. He was as dark or darker than I ever saw any one who got well, which he did, making a rapid convalescence. Dr. C. W. Rowe was over it and able to sit up when these young men were taken. I had stayed with him every night up to this time, when I left him to attend my young men. He had had a severe attack and was very yellow; bled from the nose and lips like the case shown in chromo, but not quite so dark a yellow. He felt weak and asked me to let him have some wine. I protested, and said it was bad, but he said Dr. R. K. Smith took champagne and he was well. Some friend, however, sent him several bottles. He had it put on ice and drank very moderately of it, and when I returned in the evening he had a sour stomach and was belching up the wine. This continued until he had black vomit. I gave him the creasote mixture.

R.	Creasote,	gtts.xxiv	
	Spiriti vini, gallici,	℥vj	
	Morphiæ sulphatis,	grs.ij.	M.

Sig.—Tablespoonful every two hours, in a little water.

This checked it, and he lived to the fifteenth day from his attack. The vomit at last turned almost to pure blood; continued to bleed from nose and mouth, and his stools turned black, and from that to almost blood; even the pimples on his breast and blistered surface, oozed out blood. He was a fearful sight to look at. At last he died, comatose, but was conscious up to a few hours before his death. Surgeon Adams I did not see, but he died about the same time. Rowe's nurse had the disease, and was over it when Rowe died. It excited him so much he would get up out of his bed and go to him; when Rowe died he cried and fretted so, his fever rose, and in a few days he died, almost as much exhausted as Rowe, and nearly as yellow. After Rowe's death all was confusion. The commander put Dr. Moran in charge. He had been surgeon to a negro regiment, and was discharged in Texas. He settled in Galveston, and had had a good practice. He had had the disease and recovered. He took one-half of the wards, I the other. As we differed so much in treatment I could not practice with him. The mortality was fearful; six died in one night. I recommended a change of doctor. So, finally, Assistant Surgeon Conkright was sent to take charge, and when he came things again changed for the better; upon my advice they moved the hospital, or rather received patients, out on the beach, where the Commander had erected a Post Hospital. The present one was in the Female Academy, near Exchange Hotel, H. and Twentieth streets, in the heart of the city. Dr. Conkright, wife and child, a boy about five years old, had it, but all three recovered. Dr. Conkright treated his son himself, and he was only sick a few days, two days and a half in bed. He had it so light, the doctor said he really did not think he had it; but he told me he fainted in going from his quarters across to the Post Hospital, which confirmed me in its being yellow fever. For I have seen many faint in taking only what would be thought moderate exercise. Dr. Baylor, at Navasota, said he did not have the fever when it was there, but he had a high fever of a bilious character during this time, but was up on the fourth day, and went to visit a patient in town, and fainted, which he had never done before. "Enough,"

said I, "you have had yellow fever; you will never have it again." Speaking about fainting as a symptom, it is common. I came near fainting myself on the seventh day of my attack. I had been washed and dressed, and allowed to read. I got out of bed, and went to my library to get a book. I found them upside down, and misplaced; so I attempted to arrange them, and while doing so I became very sick, and knew I was about to faint; so I dropped on the floor and lay there until my sickness passed off, when I crawled back to bed, and did not get out soon again. As further proof of this weakness I will mention Dr. R. G. Salmon. He was over the disease, had an appetite, was taking nourishment, was dressed and up. He sat down and wrote a letter to his wife, congratulating himself on his recovery. He sat writing too long, and became faint; took some alcohol, which he was in the habit of using, saying it was the only pure liquor he could get; made himself a toddy, drank it, went to bed, his fever rose, and he died the next day. I had a negro man in the City Hospital; he was sitting up in bed; had a good appetite, was quite over the disease, but too feeble to go out. His mother had been his nurse, and she wanted to go home. She asked me to let her dress him and carry him home. I said no, he is not strong enough even to be dressed, but she insisted that he had no fever, and had ate a good breakfast. But I still refused, and said it would be dangerous, and not to do it. Notwithstanding all this, when I left she washed and dressed him, and while doing so he fainted. She became frightened and left, and when I made my visit at 12 M., I found him sitting on the edge of the bed, looking much depressed. I asked him where his mother was. He said he did not know, in a confused manner, which led me to believe he was not in his right mind. So I felt for his pulse; *he had none.* I immediately gave him brandy, but it did no good; he died that night, living twelve hours without the sign of a pulse. I have seen many similar cases, but none so apparent. *I warn all from* any fatigue, or sitting up, for some five or six days after all symptoms have left, and the blood completely restored. To faint is very bad, for the stopping of the blood current for only a few seconds produces embolism, and the patient dies comatose, from congestion or syncope.

But to return to the Post Hospital. While Dr. Conkright was sick, Assistant Surgeon Bacon was sent from Austin, and he continued as Post Surgeon during the winter, and made a very complete report of the epidemic to the Surgeon General, giving a history of the whole epidemic. In his report there are several errors, as mentioned before. The number of cases of yellow fever in Post Hospital was one-fourth greater than given; as the steward put his own diagnosis on many of my cases, as I saw when I was acting as Post Surgeon, and had to sign the returns; this will lessen the ratio of mortality in like proportion. But from the death of Rowe, or from the time he took sick to the time Bacon took charge, all was confusion, as I have said before, and the management was, to me, simply horrible—steward sitting in the door, reading a novel; nurses at the windows, to keep cool; men getting out of bed to get water; some even going out of the house to the water-closet; others delirious, throwing off cover, etc., etc. In fact, the usual hospital bed is too narrow to treat a yellow fever patient in, at best, and he cannot turn over without partially uncovering himself, which I have often mentioned as bad. Some were suffering from uræmic poison, and would get up in spite of nurses, sometimes requiring two men to hold them in bed. These I requested to be tied down to the bedstead by both hands and feet. This was impossible in the City Hospital, for I could not get nurses, and all the nursing any patient had after the first of July was from convalescents, who would give them water and put on the covers, and when any became furious, I would not let them

hold them down—in fact, they could not; even in private practice, where there were plenty of nurses, they could not keep them from getting up; it is a great deal better to tie them down, although it looks cruel. A handkerchief to each limb will do, and any one can tie another down by watching the chance. I saved several lives in this way, at the City Hospital. One Irishman was very stout. It took four persons to put him on his bed. We tied him down, and he twisted and screwed around until all the cuticle came off of his back, and where the bands were around his wrists, and hemorrhage took place from the abrasions after his fever left, yet he got well and is living in Galveston yet. Another, an old sailor, came in partially delirious, but could walk about. I put him in an upper ward, as all was full below. Gave him a good bed at 12 M. At 5 o'clock I met him coming down with his bed all rolled up and tied with the ropes we had tied him down with. I asked him where he was going; he said, "out in the yard, it is too hot for me up there." I told him it would kill him and he must go back with me. We carried him back by force and tied him down again. That night he untied himself, went out on the back gallery, and either jumped or fell off; his head struck an old stump, which cut him badly, and from which he bled profusely. He was brought back and tied the third time, and on my rounds next morning I found him conscious and his fever gone; he recovered without any further trouble, and is now a wiper of bottles in a drug store at Galveston.

Mr. Jenkins, a hack driver, came in with a high fever; was delirious, and wanted to be sent back to the city. I told him he was out of his head, and to go to bed and keep still, but he followed me through the wards and threatened to whip me, if he ever caught me out of the hospital. He got out as soon as his fever left him, but was sent back the next day with a return of his fever, but conscious. This time I got him to obey orders, which he did, and recovered; is now, August 12th, a driver, at Philadelphia, to and from the Centennial grounds. A German girl took up her bed and went out in the yard and slept in the dew. She also recovered. A young man, Mr. Meyers, came to the hospital partially out of his head; was slightly comatose; passed his urine incontinently. Fever lasted five days; he turned livid black, cuticle slipped off his back, from over his testicles, along his thighs, and he was, all in all, the most abject sight I ever saw. He recovered. and is living yet. A Jew musician took quinine as a prophylactic, and became delirious, at Mr. L. Blum's; he was so troublesome he sent him to the hospital. He laid in the same condition as the above patient; his back sloughed; after his fever left, he was conscious. I could not heal up the sore; tetanus set in and he finally died from its effects. No doubt his delirium was caused by the quinine, as he was peculiarly affected, different from any other case I have seen before or since. A printer came in, delirious. When his fever left, he went back to the *Bulletin* office and worked, I believe, one day. Fever returned; he was sent back without his consent, and that night he got out. Was missed the next morning, but supposed (as he had deserted before) he had again gone back to the office. Three days after, he was found northeast of the hospital, lying in the water. The crabs and crawfish had eaten his face until he was a frightful sight. The papers made a great cry about it, and blamed me and the hospital steward greatly, but what could we do but tie such men down. We did do this, and saved some men, but this happened while all my assistants were down, and I had the entire medicines to put up for my hospital, as well as prescribe for both hospitals, and, moreover, all my nurses left me, for they could get eight and ten dollars a day, and I could not keep one only a few days at a

time. Johnny Keenan, my ward-master, was faithful to the last; and John, my colored servant, stuck to me to the last, burying all my dead, and making the coffins himself. He had it lightly at the close of the epidemic, but recovered on the sixth day.

I have mentioned the fact of the revenue cutter Delaware coming up to the city and coaling at the wharf the week Patch's family were sick. Four officers came from the vessel to the city—first lieutenant, first and second engineer, and steward. The vessel afterward went six miles below the city and anchored in Bolivar channel, as stated. Eighteen or twenty days afterward the first lieutenant and first engineer took sick, and the next day the other two. They sent for me and I went out every day to see them. Two died. I made the same prescription for these as I did for the others, as will be seen, but though they had plenty of nurses, and good ones, they could not make them do right. The first lieutenant requested me to buy him a rocking chair to use when he got better. He was in his bunk and perspiring freely. I sent him the chair that night, and next day when I went over, what should I find but him sitting up in the chair and a young man fanning him. I had cautioned him and the nurse about getting up, and had a bed-pan for him to use, so he would not have to get out of bed. I scolded the nurse, put him to bed, got him in a moisture, and left. I sent back with the boat a nurse just from Indianola, who had come well recommended. Gave him full directions about the medicines and how to nurse him. The next morning before I got around the wards the nurse was back and said his patient was dead. I hardly could believe it, but it was true, and when I got over to the ship the second engineer was taken with black vomit and died. I then told the second lieutenant, now in command, not to let another man go to bed on the boat, but to put them in a skiff and send them to the hospital. This he did until all the crew, thirty-three men, had it. He would not go down in the cabin, but slept in the rigging, ate on deck, and kept away from the sick. He alone escaped, of the entire crew. I put all these men, as they came, in a ward that only had one outside window. They all recovered, but one went up town without leave, ate condensed milk and apples. He brought some to the hospital and gave it to his shipmates, and he and two others relapsed, but he alone died. I had them watched by the steward, and my orders were, with this exception, strictly followed; but there was another fact of importance in relation to these men: they all had good constitutions; all were taken alike; I prescribed the same for each, and gave the same food, but the one next to the window was always the worst; all who occupied that bed turned yellow, while not more than two or three turned yellow who did not use that bed. This experience, more than anything else, made me believe in the plan of treatment I had adopted. With it fully carried out not more than one in thirty will die. Compare this result with other marine hospitals, and what do we see? One in three die, and sometimes more; among the U. S. troops, where I did the same work and made the same prescriptions, one in seven died; but my directions were not followed. Not one of these men ever had a hot foot-bath or a cup of hot tea. All perspired freely as soon as put to bed and one of the three and three powders given. None suffered from uræmic symptoms. All had plenty of ice water, none were allowed to get out of bed, using bed-pans and urinals in bed. All had their bowels moved with castor oil if they had not acted the same day they came in; but if bowels had moved no purgatives were given. The three and three powders moved the bowels gently about six or eight hours after the first dose was given, and if it did not act by the next day castor oil was given. I tried the solution of

citrate of magnesia, but it did not do so well and had a tendency to stop the perspiration, so I do not now give it, unless in the first six hours after the fever begins. All who needed stimulation after the fever left, had good French or peach brandy, and blisters over the stomach if there was much tenderness over the pit of the stomach. No one suffered much from sick stomach during the fever, and those that did had mustard put over stomach, and if very plethoric were cupped. Head symptoms were unusual, and I have never seen that *supra-orbital* pain so many speak of; *I think this is the result of the sweating or heating treatment resorted to by most practitioners, and nearly always by nurses.* This is the great cause of the high pulse and temperature also spoken of; I have seen it cause the fever to be prolonged to five days, when without it the fever will leave on the third or fourth day at most. I tried, and often saw tried, the chlorine mixture of Dr. Labadie. It always increased the fever, and from that fact I gave it in depressed and congestive cases; I think it is a good and safe prescription in those of weak lungs, and hemorrhagic tendencies, and in *no other cases*, and I think, upon a close examination, in the nineteen cases of black vomit Dr. Labadie reports, more is due to the creasote and tincture of iron and morphine than to his chlorine mixture. This chlorine mixture was a favorite of Dr. Fenner, of New Orleans, as Dr. Heard says, and may have been used in the æsthenic or adynamic variety. Another important fact worthy of special note, is that with every rain there was a depression and the mercurials had to be stopped or given in smaller doses, which I usually did, changing to the following:—

℞. Hyd. ch. mitis, gr.vj
Opii et ipecac pul.
Quiniæ sulphatis, āā gr.ix. M.
Fiat chart. No. 3.
Sig.—One every three hours.

I gave a greater proportion of these powders to children than to adults, risking six and six from four to ten years, and from one to four years, four and four grains, one every three hours, and I did not lose a single case in forty-two cases I treated this year. I only saw two die; one, a patient of Dr. R., was in convulsions and died in a few hours. The other, a patient of Dr. H., a negro child, literally burned up with hot teas, blankets and hot bottles; skin was spotted with excessive heat; was out of its head, and died from uræmia. Four of my forty-two cases had black vomit. Two of Mr. Cook's children had it when they first called me in. The family had treated them without a doctor, until they saw the black vomit. I gave them the creasote mixture and both recovered. Mr. Marshall's boy, about ten years old, had it one night, but expecting it, I put him on the creasote mixture, and the next morning he was better and the black vomit had ceased; I blistered this boy over the stomach, which was very tender, besides giving him the creasote mixture in teaspoonful doses all night, and next day when reaction was fully restored I gave him the tonic mixture:—

℞. Tinc. cinchonæ,
Tinc. gentianæ,
Tinc. ferri, āā ℥ij.
Sig.—Teaspoonful every two hours, in a little water, until four doses were given.

The other was a little boy on avenue A., near the City Hospital, who had the vomit for three days; he was blistered over the stomach and took the creasote mix-

ture until the vomit ceased, and then the tonic mixture, and recovered. We had twenty-seven recoveries in the City Hospital this year, out of six hundred and sixty-seven cases treated; how many had it I do not now remember. I think about one in three recovered from the black vomit; this was much better than I have ever done before or since, though I have tried everything mentioned, and this year stuck closely to this prescription; and when it failed, as I have before said, all others failed; but I began it sooner and kept it up until reaction was fully restored.

It will be seen I do not give any quinine in the cold stage of yellow fever, and believe it to be injurious unless there is a decided intermission, showing the complication of malaria; but then I always give it with some stimulant, as brandy or the tonic mixture. The sequel will show, at Calvert, that I had often to resort to quinine in relapsed cases, and with good results, but even then I did not give it until there was a second paroxysm, showing a decided malarial tendency. This epidemic nearly ceased by the 5th of October, and I was wearied out; so I left Galveston and went to Houston, with the intention of going up the railroad, where it was then prevailing, and where the mortality was frightful; I had taken up the idea that it was from giving too large doses of mercury, and too severe purgatives in the hot stage and quinine in the cold stage, as they treat malarial fevers, and I wished to assure myself if my conjectures were true. I staid with Dr. Brickell while in Houston, visited all his patients, and found him treating the disease on the same plan I had been, and with good success. In the night he was called up to see a young lady at Mrs. Young's school, whom we had visited in the day, and as she was an old Brazoria friend of mine, he asked me to go with him to see her. We found her very nervous, with no apparent just cause, as her fever had left, and her pulse good; I suggested that perhaps the catamenia had returned, or was about to return, and this was the cause; I spoke of Miss S., of Galveston, and other cases I had seen; upon inquiry we found this was the case. We prescribed the valerianate of zinc, used in Miss Smith's case, and it acted like a charm; the next morning she was cheerful and happy, and recovered. I visited the Eureka Mills, within four miles from Houston, with him that day, where he had some eight or ten cases, and several very yellow, and one with black vomit. He was using a solution of perchloride of iron, which I found was popular in Houston, and they had been successful with it. The great storm came that day, and it was reported that Galveston had been washed away; cars were stopped, and bridges broken. So I abandoned my further trip up the country, and returned on first boat to Galveston. This storm had no effect on the disease at Galveston or Houston; it continued to linger in Galveston, and we had seven and eight patients at a time until near Christmas. I tried the perchloride of iron on all the cases of black vomit that came into the hospital after my return, and four cases recovered out of five. Dr. Wilkerson, house surgeon, watched them closely himself, even giving the medicine himself. It should be observed that we gave the medicine earlier in the attack than at the commencement of the epidemic, and this may have caused the greater success.

Before leaving the great epidemic of 1867, it is proper to state that cases occurred up to January, 1868, and a few deaths at the three hospitals. At St. Mary's Infirmary there were thirteen deaths from yellow fever before any record was made of yellow fever—calling the cases uræmia, congestive or pernicious fever, when they died conscious, from hemorrhage. Dr. Nagle, surgeon in charge, could not be made to believe it was yellow fever. He had been in the East Indies, and said it was the fever he treated there; gave his oleum tiglii and mercurials, as in 1864, and exhausted his

patients; when he did admit it to be yellow fever, the sweating plan was carried out, and the mortality was at least one in three, and according to Surgeon Bacon's report, 42 per cent. in the whole epidemic; 32 per cent. in Post Hospital, and 28 per cent. in City Hospital, where I had charge. The Post Hospital, as I have stated, was rather too high, and the St. Mary's Infirmary too low, for the reasons I have given, and I know I speak the truth; Surgeon Bacon said, in his report, I was "*good authority*" (Yellow Fever at Galveston, 1867. Surgeon General's Report on Yellow Fever and Cholera).

A few more facts about this epidemic at Galveston. It commenced on the 22d of June, and the last cases I treated were in a block next to the City Hospital, where some negroes lived through the epidemic, and did a great deal of washing for yellow fever patients. A family came down from Gonzales county, a mother and two children; they were all taken on the 15th of February; had well-marked cases, but all recovered. These were my last cases, and the last I saw and heard of yellow fever until 1870. It was undoubtedly introduced from three sources: New Orleans, by my patient that died of black vomit while I was giving him quinine to keep off his chill. Four sailors from a steamship from Key West, the 22d of June; and Muller, from Indianola, who died on the 3d of July, of whom Dr. Welch speaks in his report. These were all undisputed after the epidemic got full headway. Surgeon Taylor believed he caught it in St. Charles Hotel, New Orleans, where he had been to see if the epidemic was yellow fever, but we had quite an epidemic in Galveston when he took it. It will be seen that it raged for three months, which is the usual time it lasts in all warm countries where it is not cut short by cold weather, but it has lingered on for over six months in Galveston, and but for the cold of our winters would never die out, while we have so much immigration and new food for it. So Dr. Welch is much mistaken if he believes it is not killed out by frost. There are hundreds of instances outside of Texas, in which it has been killed by frost. The reports of Dr. Heard and other physicians, in Texas, show that it was killed out by frost that year. In all our interior towns nothing else did kill it. I will also instance the epidemic at Galveston, in 1848, when it commenced in October, and was killed in six weeks by frost; while if there had been no cold weather it would have been at its highest. (See table of epidemics at Galveston, page 137.) There is no fact so well established as that it cannot spread in a temperature of 32°, but it may be in the patient's system and break out, or the germ may be kept in the clothing or rooms, where the temperature never falls below 32°. Black vomit has been kept by Drs. B. and M. Dowler for fifteen years without any apparent change, and I kept some from 1864 to 1871, when my office was burned, and I could not see any change.

I treated this year six hundred and sixty seven cases in City Hospital; one hundred and ninety-six in Post Hospital; forty-two children and over two hundred adults in private practice, making in all over ten hundred and sixty-three cases; some days prescribing and visiting two or three times, over two hundred cases. I saw in consultation and at the other hospitals, at least one hundred more; losing twenty-four per cent, in City Hospital, which was under my immediate and entire control. It was a general hospital, but very few females or children were received. Patients were admitted from city, county, United States marines, from foreign vessels, Hebrew Benevolent Society, and Howard Association. Several were received in a dying condition, and two died before we got them to bed. The Howard Association sent a committee to examine their patients every week, and they reported in the city papers that they sent their poorest and worst patients—nearly

all men—to my hospital, and we cured more than were cured at St. Mary's, where they sent nearly all their women and children, best patients. The sweating plan was strictly followed at this institution, and this was the main cause of their great loss. I had great trouble to have my directions carried out in private practice. They would sweat them with hot bottles, baths and teas, and restrain them from water, in spite of me; I had a negro nurse belonging to the Howard Association to throw away my medicine and give his own; he had the impudence to acknowledge it to me. I lost my patient, and I drove him off. If another ever serves me thus again I intend to have him tried for murder, for it is nothing else. I lost an Irishman on Avenue B., from the family keeping him too hot, in spite of me. They would give him hot teas when I was gone. I bled him and did everything I could to break his fever, but it never cooled until death, though he sweated profusely. I bled three other cases this year—one died and the other two recovered; all four were hopeless cases, nothing would break their fever, so we bled them, and two out of the four were saved. All were stout, with ruddy complexion, and had a high bounding pulse. They all took the three and three powders.

Upon the whole it was the best success, with such cases, ever reported from any general hospital. What proportion had black vomit I am unable to tell. The exact proportion that turned yellow I am also unable to say, as I was so busy I could not take notes after the 23d of July, as before stated. The deaths in the City and Post Hospitals are given from the hospital records, by Assistant Surgeon Bacon, in his report. For the epidemic in other cities, I would refer the reader to Dr. Heard's reports, and his positive statement, at page 69, that it *was introduced in every case by importation, and that it was stopped by cold weather.*

We had an entire exemption in Galveston from 1867 to 1870. This year it was introduced from three sources: Mrs. Lauve, who died, took it from a lady from New Orleans; captain and family from Mobile, and a captain from Havana. There were sixty-two cases and seventeen deaths. When the first case died, I was in Houston, attending a stricture case, and before I returned, Mr. Darragh's son died, opposite to where Mr. Frank Dean, my brother-in-law, lived. He hallooed and screamed, and ran out on the gallery, and was seen and heard by Mrs. Dean and my wife, who slept, while I was away, on the north side of the street, opposite to Mr. Darragh's, and went back and forth every day, from Mr. Dean's to my house—Avenue I and 26th street—passing by Mr. Ferdinand Flake's, who lived opposite to me on north side of Avenue I. Mr. Flake's son had it at the same time with Mr. Darragh's, but, I believe, recovered.

On my return from Houston, Mr. Dean moved his family down the island six miles, and my wife and step-daughter went down with him. The day after they left my wife was taken with a chill, and Mr. Dean sent for me. I went down and stayed with my wife until she recovered. She had nearly as bad an attack as I ever saw, where the patient did not turn yellow, and was at one time threatened with black vomit. Complained of great burning in the stomach, and hallooed and screamed until I covered up her chest with a mustard plaster, and gave her some valerianate of zinc, when it stopped, and she fell asleep. She had her catamenia to return, though she had only been over them a week. As she did not turn yellow nor have black vomit, the families that saw her did not believe she had had the yellow fever; my step-daughter said if mamma had had the yellow fever, she would not mind having it, and wished she could take it, and I really wished all of them could have had it then, but not one of the twelve took it from her. This I have often seen in

this neighborhood, as the case of the gardener, in 1867, spoken of page 14, and the soldiers, in 1864. Mrs. D. had never had a fever before, since we were married, April 22d, 1868, and this, with her exposure and the fact of her catamenia returning, was proof enough that it was genuine yellow fever, as this return of catamenia does not occur in bilious fever, and I have only seen it in yellow fever, dengue and small-pox. It is almost constant, as I have said, in yellow fever and dengue. After Mrs. Dowell recovered, I left them and returned to the city. As soon as she was able to leave she returned to town. I saw several cases in consultation, and treated seven more; all recovered that I had control of. I was requested, by Captain Joseph Aiken, to see a family on avenue K and Tenth street, who had about ten days before come from Mobile, through New Orleans; the father was a captain and took charge of a boat in Buffalo Bayou; took the fever and died from home. His oldest son was taken about the same time, but when I called he was up; his two sisters were taken the day before and were lying in the same bed, with flushed faces, injected eyes, perspiring freely, but very nervous. Their tongues were red at the edges and a dark streak in the centre, looking as if they had had typhoid fever, and were in about the ninth day. This has been a common symptom in yellow fever cases in all epidemics I have seen, and is a great help in diagnosing this fever from remittents, as well as the injected condition of the eyes, and redness and injected condition of the skin, spoken of by Dr. Welch in his report. Dr. C. H. Wilkerson was with me, and he as well as myself believed, from all the circumstances, they were genuine cases of yellow fever; it will be remembered Dr. W. was with me in the City Hospital, in 1867, had it, and saw a great deal of it in every stage and form.

Clamance Portier, a French boy, who lived near the post office and was a clerk or porter for Captain Aiken, took it and had the same symptoms as the family on Avenue K. He was treated by Dr. Haley, but his mother called me in, as Dr. Haley did not believe it was yellow fever. He recovered without any bad symptoms. This boy was reported to have had yellow fever in Brownsville, Texas, in 1867, but he certainly had it this time and will never have it again. As few cases as there were this year I saw all the varieties—yellow skin, black vomit, and melæna, hemorrhage from the nose, etc. The weather continued very dry and hot, and thousands left the city. Dr. Peete, the health officer, was loth to recognize it, as he was quarantine surgeon and did not wish to admit that he had let the cases come in, and he and others tried to prove the disease originated in Galveston; when I told him Darragh had it he became furious: "Pshaw, Dowell, you are incorrigible. How do you know it was yellow fever when you did not see the case? It was mania-a-potu." I replied, "well, he was hemorrhagic and yellow, screamed and ran out of the house, and cried when conscious, and could not tell where it pained him. This is enough for me. I never saw a case of mania-a-potu do this, and I have seen many cases of yellow fever where the patient suffered from uræmia, which he did."

Assistant Surgeon McKelvey, post surgeon of Galveston, collected all the cases and showed me his report. He had fifty-nine cases and seventeen deaths; the number of deaths and cases of black vomit and yellowness of the skin, four.

Three causes prevented us from having a great epidemic this year. The long-continued drought drying up everything, the frightful stampede of unprotected persons, and the use of disinfectants in the rooms, washing and burning the bedding, and isolation of cases. We had no more cases of yellow fever until 1873, when dengue was the prevailing epidemic. This year there were but few cases, yet I saw well-marked cases of every variety and many cases of dengue fever.

YELLOW FEVER IN GALVESTON IN 1873.

I saw no cases resembling yellow fever until about the first of September, and while I was absent from the city one case of death from black vomit, with yellow skin, was reported by Dr. Trueheart. Several others, of our oldest and best physicians, agreed with him in the diagnosis. Dr. Howard, of Houston, reported to have treated three cases. On my return to the city, on the twelfth of September, I saw Mr. Gallagher, who was one of the patients treated by Dr. Howard, of Houston. He was sallow and feeble; had several relapses with intermittents, and took a great deal of quinine. Mr. Gallagher was a medical student; had taken one course; he thinks he had genuine yellow fever. Mrs. Gallagher (his wife) was taken about twelve days after his return; his partner two days after. Mrs. Gallagher and a newsboy living with Mr. Gallagher had a fever of the dengue type. Mr. Gallagher, his wife and partner were all sick at the same time; they all had red tongues and brown fur. With Mrs. Gallagher, there was an eruption of pimples almost like measles, and she had all the symptoms of the milder form of yellow fever, or the extreme form of dengue; was pregnant; vomited frequently; was threatened with miscarriage, for which she had to take large doses of opiates, principally morphine. But she had often been attacked with these symptoms before her attack of dengue, for I cannot call it anything else, as she did not suffer from uræmia; did not turn yellow; vomited only mucus and water with food taken. But her case was such as would make it hard to decide whether it was a mild case of yellow fever or a severe case of dengue; so, also, with a case near the railroad depot that I was treating at the same time; but all recovered and none turned yellow. The little boy at Mr. Gallagher's had the dengue for three days; he had had yellow fever in 1867; his mother took it before he got out to business; his sister the day after his mother—all three having had yellow fever in 1867. While these cases were being treated, I was called to make a post-mortem on a man who had been up to Houston—a sailor, an Englishman by birth, who was staying with Mr. Phar, an old Galvestonian; he had bilious fever, and was treated by Dr. Rogers some weeks before; when he returned to Mr. Phar's he was sick with a fever, but refused to have a doctor, saying he had some of Dr. Rogers' former prescription and he would take that; his fever had lasted three days; the morning he died, he got up, dressed himself and ate his breakfast, but was soon taken very sick and went to the privy, where he was found in a dying condition a little while after he had left the house; he died before they could get him to his room. I saw him three hours after death; he was then very warm; had been blistered over the stomach, which Mr. Phar said he had done for him. His neck was of a deep yellow efflorescence. The police refused to let us examine his body by a post-mortem, and the jury found he died from a cause unknown to them. I refused to give my opinion, but said, if they pressed me, I would say the death was caused by yellow fever. So the jury were recalled, the body removed, and we made the post-mortem, but found no vomit in his stomach; his liver was perfectly sound; spleen very much enlarged and soft; stomach sound; gall bladder filled with a poor, pale bile; liver adhered to the abdominal wall in front; the mesentery and omentum were attached, and had to be cut in several places; kidneys appeared sound; no urine in bladder; intestines natural; brain not examined. After this we pronounced it a case of chronic splenitis, and the patient to have died from congestive malarial fever; but now, as the sequel will show, I believe the case was one of genuine yellow fever, and that he died of uræmic poison. His urine was reported to

have been natural; therefore, it could not have been hæmaturia miasmatica. About this time another case died near the depot, that three physicians pronounced yellow fever.

Dr. Calloway reported another death near the depot, of yellow fever. Beyond Bath Avenue, toward the depot, another case died under Dr. Kelley, that parties who saw the case believed to be yellow fever. The family afterward employed me, and I thought two cases had it, but as they were light, and recovered, I pronounced it dengue. The 4th of October I was called to see a man at the Red Jacket hotel, near the depot, who was speechless when I saw him in the morning; I learned from the proprietor of the house that six weeks before he was in the city hospital under treatment for malarial fever; recovered, and went up to Dickinson's Bayou, twenty-six miles above this city; relapsed, and returned; he tried to obtain employment; failing in this, he went back up the railroad, and returned, yellow, with melæna from his bowels, and almost speechless; was put to bed with what the proprietor thought only a chill, thinking he would be better by morning. When morning came, he was found to be much worse. I was sent for, and reached him at nine o'clock; found him in the following condition: speechless, but sensible; put out his tongue, when requested to do so; was yellow all over, of a leaden yellow hue, and livid in spots; was passing melæna in great quantities from his bowels, and had been during the night, as it was all over the bed clothes; had urinated during the night; urine of a straw color; pulse hardly perceptible; was evidently moribund. I prescribed for him, but they got a priest, and he died at 1 o'clock, without having taken anything except a little brandy or whisky. At three o'clock, assisted by Dr. Ganahl, I made a post-mortem. Found about a quart of black vomit in his stomach. The coat of the stomach looked as if black pepper had been sprinkled over it, with black vomit pouring out at every pore; no urine in the bladder, but was reported to have urinated just before he died; temperature in the rectum one hundred and three; much melæna in the entire bowel; liver sound; black vomit in the gall bladder, which was extremely full; no signs of bile; spleen large and soft, like the other case; chest and brain not examined. This I pronounced a well-marked case of yellow fever.

About this time Dr. Granahl made a post-mortem on a case at the city hospital, that he believed to be yellow fever. He found black vomit. Saturday following, there were three cases in the city hospital, of whom two died; one other was reported to me to have died at St. Mary's Infirmary. This is all that I know concerning yellow fever in Galveston this year.

I have fully reported in the *Galveston Medical Journal* the epidemics of 1864–67, and the sporadic cases of 1866 and 1870. During the twelve years I have lived here we have had two terrible epidemics, and three sporadic seasons. No cases the other years. Every year that it has been here as an epidemic Hitchcock's Bayou has been dry. That year we had regular rains, perfect floods, every ten or fifteen days. These, with the disinfection used by the health officer, are my reasons why it did not spread.

Where it came from here, I cannot say. It had been in Pensacola, Memphis, New Orleans, Shreveport, Calvert, Marshall, Columbus, Harrisburg and Houston, though there were but a few well-recognized cases in the latter place. They had rains, like we had, and persons and goods came from all the infected places mentioned, yet it has not spread in Houston or Galveston, though it was in both places for three months, and not more than ten deaths in all, perhaps, in both places,

with a population of twenty-five thousand in Galveston, and fifteen thousand in Houston. Dengue was not in Calvert, but has been as bad at Austin as here; more than two thousand persons reported to have had it. It has been in Dallas and Waco, and has failed to visit every other place that I have heard from.

Is yellow fever and dengue the same species of disease? If we look at the period of the fever, the color of the tongue, and the injected condition of the skin, we would have to say they were identical; but dengue does not give immunity from yellow fever, nor does yellow fever give immunity from dengue, as I have shown by the Compton family and my own case; but more of this, when I have given my experience obtained at Calvert.

YELLOW FEVER IN CALVERT IN 1873.

On the 13th of October I was sent by the city of Galveston, with Dr. J. H. Kerr, and sixteen nurses, male and female, from this city.

They had a case, reported yellow fever, to die with black vomit at the Haynes House, in Calvert. Two young men came from Shreveport, and on the second day one was taken sick with the fever at the Haynes house; the other went up the road to Denison. The one that was taken sick died on the fourth day with black vomit (Mr. Hughes was his name), and it spread from him. When we arrived we found thirty-six dead. I shall frequently refer to them in speaking of cases, their symptoms and treatment. Dr. Fields had died, and Dr. Gilson was believed to be dying, before we arrived; he did die next day. Dr. Coleman (see his own report), who had treated Mr. Hughes, had the fever, but recovered; he went out too soon and relapsed. On the evening of the 13th, just after my arrival, I was called to see him. I found him bleeding from his mouth; very yellow and feeble, with some nausea; ordered him equal parts of the tincture of iron and cubebs, in teaspoonful doses every three hours; beef tea, fresh milk, and ice water, as much as he could drink; also small draughts of brandy occasionally. In the meantime I treated his son, his daughter, and a little girl, fourteen years old; all recovering in five or six days. All were taken with a moderately high fever, hot skin, with pulse from sixty to one hundred, never over or under those numbers; always compressible; some had sick stomach, which was treated with mustard cataplasms over that organ. I gave them all plenty of ice water in the first twenty-four hours; kept them covered up well and warm; ordered no hot teas; did not allow any; their mother had given them oil and a mustard foot-bath, which I always approve, and believe to be generally necessary. When thus treated and put to bed, covered up warm, free from draughts of air, they perspired freely.

Upon the second day, if the tongue was red around its edges, brown on top, with red streaks down the centre, which was almost invariably the case in all the cases I saw—looking as if they had had typhoid fever for ten days—I gave them calomel, quinine and Dover's powder, as I gave it in the dengue epidemic, sometimes using these powders for two days; they generally cleaned off the tongue, it became moist, and remained so until the fever left them, which it would do in two to five days, depending in part on the proper nursing. Where the kidneys did not act well I gave the tincture of aconite and digitalis, buchu, cubebs or uva ursi, full doses—say of aconite ten drops; digitalis, five; buchu, cubebs and uva ursi in teaspoonfuls—every two hours. Tincture of iron and cubebs according to former prescription when uræmia or black vomit was expected. Black vomit was always expected when there was great nausea, with a red, cracked and bleeding tongue. Uræmia was indicated

by a diminution of the amount of urine voided; disposition to delirium and restlessness; patients being unmanageable, getting out of their beds, putting on their clothes, seeing imaginary objects, etc. But I am wandering off on treatment and symptoms, which I intend to illustrate by particular cases.

The night after I arrived at Calvert I was called to see Major Tillman, in the seventh day of his illness. Fever gone, speechless and perfectly yellow, but would look at me when I called to him. I gave him, as he was hot, equal parts of tincture of aconite and cubebs—teaspoonful in a little water, every two hours. He became conscious, got up and walked around his room; relapsed, and died next day. I was called that night to see Mr. Baker, his wife having died the day before. He was then in his fifth day; skin very hot; had voided no urine for twelve hours; had been kept from water; had hot teas given him; was covered with bundles of blankets; tongue red; face red; pulse eighty and intermitting. I gave him tincture of cubebs in teaspoonful doses; ice water as much as he would swallow; put turpentine cataplasms to his bowels and took off some of the blankets; left him at one o'clock, P. M.; was called to see him again that night; pulse entirely gone; delirious; gave him brandy; applied mustard to hands and feet; he reacted by daylight, but was furiously mad; wanted to get up; kicked out the windows; took four men to hold him on his bed; no urine had been passed; bowels moved with citrate of magnesia solution; stool natural. He lived until about daylight next day; he was a victim of the sweating plan, and was killed by being rolled up in blankets and deprived of water. He died of uræmia, as did nearly all who were denied water.

Mr. Bell was in the same room, in the second day of his illness, under the treatment of Drs. Ketchum and Tryon, two young men whose heroic conduct I highly appreciated; they were willing to learn; Dr. Ketchum especially, who is a nephew of Dr. Ketchum of Mobile; he had seen yellow fever before. Mr. Bell was in his second day, with a brown tongue, red at tip, down the centre and around the edges, which I have often said was peculiarly the type of yellow fever tongue. I suggested plenty of ice water and wrote out the following prescription for them, viz.:—

℞. Quiniæ sulph.,
Pulv. doveri,
Hyd. chlo. mite, āā grs.ix. M.

Fiat chart No. 3.
Sig.—One every three hours.

This cleaned off his tongue, broke his fever, and in eight days he was up; went down town and relapsed. I then treated him on the same plan; his fever turned into an intermittent; I gave him quinine for several days, and put him upon the following tonic, which I have used so often, viz.: Equal parts of the tincture of columbo, cinchona and gentian, of which a tablespoonful was ordered every two hours, until four doses had been taken each day. He had a light hemorrhage from the lungs; turned leaden yellow; considerable yellowness about his eyes. He took a prescription from his father and brother for the hemorrhage, but I recommended equal parts of the tincture of iron and catechu, a teaspoonful three times daily. He was up when I left Calvert, but feeble. In this family I treated a Miss Harris, who had a very red tongue, pain in back and great headache. I gave her castor oil, or rather she had taken it; mustard foot-bath. I gave her but little medicine; fever left her on the second day; she was up for a week and relapsed; treated her as before, but gave her quinine for several days and the cinchona tonic. She was

up when I left, but says she never had yellow fever; was going down town next day, to convince me she had never had it. Going out too soon caused many to die, and she may yet pay the forfeit. I have often spoken of giving quinine in yellow fever, and must be permitted to say again that in the first three days it is the best remedy I have ever used, in the way I prescribe it, in the hot stage, and when the tongue is dry and brown, or covered with a black fur; but I never give it during the calm stage, unless the tongue is very foul, and then it does no good by itself, and with its aid nèarly all die; without opium and calomel, it will not do on a clean tongue and a cold skin, as it makes the tongue tremulous and the skin cold as death. It will not bring about a reaction, but retards it. Its action here is the reverse of its action in intermittents and remittents, but while the fever lasts it prevents congestion of the brain, stomach, or kidneys, and when treated as I treat yellow fever, when the fever is gone the patient wants nothing but beef-tea, good pure milk and soft eggs. When the pulse sinks, the skin gets cold. Brandy! I say brandy! for it alone is the only stimulant that I have ever found to do good, except, in some rare cases, gin, where there was a tendency to uræmia; but gin gives the patient hiccoughs often, and brandy does not. Wines of all kinds sour on the stomach; porter and ale also; champagne, especially; I have never known it given that it did not do harm; I will refer to several cases in which I believe it caused the patients' death. Brandy does good in all cases where a stimulant is required, and should only be given by a physician. No nurse should ever venture to give a particle. I know of several that were killed by brandy when they were out of all danger if they had been let alone. At Calvert I know it killed more than it assisted in curing. It is excellent to stop black vomit. It stopped all cases I treated with the following:—

℞.	Brandy,	℥iv	
	Morphine,	gr.j	
	Creasote,	♏x.	M.

Sig.—Tablespoonful in a glass of water, every three or four hours, or less water if the patient will tolerate it.

Though it stopped or prevented the vomit, my patients all died who had it at Calvert but one, a Mrs. Foster, whose case I will report in full.

All cases that came under my observation with melæna discharges died. I think this symptom equally as fatal as black vomit, and it is the only evacuation of yellow fever I ever smell, though I hear a great deal of yellow fever smell. All who are wrapped in four or five blankets, for four or five days, not given any water or allowed to change their clothes or bedclothes, smell, but patients treated in the manner that I have laid down never smell. Keep the patient comfortable, supply all his wants; I give but this advice: Give them all the ice water they want; cover them up; get them warm and moist; do not heat them; do not put hot bottles or bricks to their feet unless patients say they are cold; when delirious we find them so; when there is headache give some sudorific until the skin is moist, when the headache will cease; if there is much nausea apply mustard and blisters; if the kidneys do not act give spirits of nitre; I prefer digitalis while there is fever, and tincture of iron and cubebs when the skin is cold; when the patient is sleepless I use the bromide of potash with more benefit than any other remedy. When there is constant watching I give valerianate of zinc, ten-grain doses every two hours. Sometimes this condition lasted for five or six days, every day fearing my patient would throw up black vomit, but with this I saved many.

With these remarks I will continue my history, as this will save me much recapitulation.

I remained at Calvert twenty-one days, during which time I treated one hundred and sixty cases, taking them as they came, some dying, and many were turned over to me in the last stages; out of all I prescribed for, twenty-seven died. Where I had good nurses, and my directions were fully carried out, the mortality was small. I treated at Capt. Holdman's five whites and three blacks; all recovered but his son Freddy, who was delirious and screaming when I saw him; his parotid glands were greatly enlarged; he had been under treatment by Dr. Moran. I considered him perfectly hopeless.

All of Mr. Adoue's family recovered, three cases. All of Mr. Keffer's family recovered; his daughter, who had been deprived of water and heated too hot by one of the nurses on the first day, had a high fever for five days, all in consequence of bad nursing at first. Mrs. Adoue was also kept from water and made too hot on the first day; when I returned to see her that night I was much alarmed by her condition. I prevailed on her husband to follow my directions during the night, and found her much better next day.

I have never in all my life had so much trouble in getting my directions carried out. Many of my prescriptions were thrown away by the nurses; one of them was *smart* enough to say, when a doctor came in he always left. Where my directions were followed fully, I scarcely lost a case; and where the head of a family was cool, calm and collected, as in Dr. Ball's, all recovered out of twelve cases, I believe. *All habitual drinkers died;* some died with black vomit, some with uræmia. *None recovered who were taken while drunk,* that I know of. Four or five cases died who were reported to have had the fever, but I think they died from drunkenness, as they went from house to house drinking "like fish." One of them had the most violent convulsions I ever saw, but recovered. These, as before said, were not second cases, but *killed themselves with whisky.* This was disputed by Doctor Powell, but is as true as heaven.

Many relapsed, and died from imprudence. I have given and could give the names of many others, who killed themselves in that way. Captain Reed was entirely recovered, and had been for twelve days; he went out hunting one day, waded in ponds, got wet, came home with neuralgia of the head, and died next night, in spite of all that doctors and nurses could do for him.

Wherever there occurred a case of black vomit in a house, all the other cases seemed worse, as in Mr. Montgomery's family; all died except himself. I did not treat any of his family; they were in the hands of those who *sweated and deprived* their patients of *water*; that they *died* should not be wondered at. This is the gentleman whose wife was sick when Dr. Palmer was there; and if there ever was a family who had yellow fever, this one had. The old gentleman was standing alone at his gate the last t me I saw him—all gone.

I was several times refused permission to see my patients by a lady nurse, because I gave calomel and water. May God forgive her, for she knew not what she was doing. No nurse of any *experience* should *violate* a doctor's instructions; if they would think one moment, they would not be mean enough to do so.

I treated three cases, in whom hemorrhage from the nose was persistent. I finally suppressed it by plugging the nostrils. The color of the skin in these cases was very peculiar; they were spotted yellow, almost a piebald, and looked a good deal like piebald tobacco when in the green state. They all recovered, but convalescence was

long and protracted. I gave them turpentine emulsion and tincture of cinchona internally while the hemorrhage lasted, and plugged the nostrils with cotton soaked in the perchloride of iron. After the hemorrhage, gave the columbo, gentian and cinchona tonic.

Mrs. Foster, who had black vomit, when I first saw her was nearly pulseless and slightly delirious; gave her

R.	Brandy,	℥iv
	Creasote,	gtt.xx
	Morphine,	gr.j.

Sig.—Tablespoonful in a glass of water, every two hours.

I alternated this with tincture of iron four ounces, tincture of cubebs six ounces—a tablespoonful every four hours; tincture iodine applied to the tonsils; fed her regularly with beef tea every two hours; fresh milk and lemonade when she wanted it. She vomited black vomit for two days before I stopped it, but she gradually improved from my first visit. She bled from her gums a good deal, was very black in her face, and spotted black on her back, her parotid glands became much swollen, and threatened to suppurate. Tincture iodine used.

In the same house with Mrs. Foster, I treated Dr. Mead; he had been sweated nearly to death; had a high, scorching fever; eyes very red; put him on the calomel, quinine and Dover's powders; gave him plenty of water, and gradually took off some of his clothes, and cooled him down; in a few days he recovered, but relapsed twice by imprudence; same treatment; he finally recovered.

There were exposed to this epidemic about six hundred and fifty persons; at least five hundred and fifty of them had the fever; of these about one hundred and sixty-five died, of whom fourteen were blacks.*

I think the slaughter house below the city and the privies were the cause of the fever at Calvert.

I have the best of reasons for saying that *yellow fever* is fed by *animal filth*, and any place *entirely free from it will never have an epidemic* of yellow fever. Animal filth breeds fomites and animalcules; they, coming in contact with the blood, set up a fermentation in the body, and every drop of blood is changed before the patient is convalescent. I do not believe it is contagious, but very readily propagated, in persons and goods, in cars and in ships. Whether the body exhales a material or a germ, it does come and multiply in and through the person, call it infection, contagion, or whatever you will. *No quarantine can keep it out, except by absolute non-intercourse*, as it will lie dormant in the system at least eighteen days, as I could show if I had time and space. Hygienic rules will keep it down, if strictly enforced, and will keep it out, if no one is admitted with it, or imported on shipboard or other means. It has never occurred in the United States that it could not be traced to importation, though we often hear of cases before importation is noticed.

The criticisms of Drs. Palmer and Harrison on the epidemic at Calvert are unworthy of those gentlemen, and calculated to do harm and retard scientific progress. Dr. Powell's report is enough to satisfy any one except themselves; not to mention the positive assertions of Drs. Coleman, Ashbel Smith, George W. Peete, W. S. Rogers, W. D. Kelley, of Galveston (who made a visit to Calvert); Drs. Butler and J. H. Kerr (who went there with me); Dr. Moran (who lived there); the gentlemen spoken of in Galveston in 1867; Drs. Ketchum, Tryon, and Young,

* The death list alluded to has been misplaced, and cannot be found.

from Houston; Jamison, of Millican; Pyle, of Hempstead; Dr. Ball, living in Calvert, and Chevalier, who once resided in Galveston. *Query—Were we all a set of fools?* Let the readers of this book answer. I have tried to make it as plain as possible, and set down nothing but the truth. I have not resorted to any special pleading, made but few excerpts, and refrained from calling the reader's attention to the points in which I differ with the various reporters, leaving them to judge from what I have written.

The following is a list of authors who do not believe in second attacks:—Drs. Arejula, Armiel, Berthe, Belka, Barry—Sir David, Chisholm, Currie, Cathrall, Dowell, Fellows—Sir James, Frazier, Griffith, Gilpin—Sir Joseph, Gillkrest, Gonzales, Kuhn, Louis, Monges, Pariset, Palmer, Pym—Sir William, Rimeno, Rogers, Rubini, Rochet, Redman, Smith—Ashbel, Stone—Warren, Smith—T., Tomassini, Vance, Wilson, Wistar, and many others.

Perhaps a like number believe in occasional second attacks, but these authors made no distinction between remittents and yellow fever. Rush, of Philadelphia, was a believer in second attacks, even several; Potter, of Baltimore, eight, ten, or more; La Roche was also a believer in second attacks and local origin; but the evidence against these is so overwhelming that we may conclude, with Louis, second attacks may be possible but not probable. It may occur locally, but there are so many cases proven of its undoubted introduction, we may well disbelieve those cases where it cannot be proven.

No time of residence in a Southern latitude gives protection. There is no protection but through an attack.

The map and chromo explain themselves, and are a volume in their instruction, and a biographical report of papers and authors. The two chromos of the color of the skin show the two extremes of color in which the patient usually dies; one without color, the other very yellow.

The following is a table showing the mortality at New Orleans in the epidemic of 1853, according to race and climate. Ratio, 1 per 1000—Barton:—

	Per Thousand.
Strangers from Holland and Belgium	328.94
" " Ireland	220.08
" " Denmark, Sweden, and Russia	163.26
" " Iceland	102.04
" " Great Britain	52.19
" " British America	50.24
" " France	48.13
" " Ohio, Indiana, Illinois, and Missouri	44.26
" " New York, Vermont, Massachusetts, Indiana, Rhode Island and Connecticut	32.83
" " North Carolina, Virginia, Maryland, Tennessee, and Kentucky	30.69
" " Spain and Italy	22.06
" " Arkansas, Tennessee, Mississippi, Alabama, and Georgia,	12.22
" " West Indies, South America, and Mexico	6.14
" " New Orleans and State of Louisiana	3.58

These statistics cannot be disputed, but if we take into consideration the fact that New Orleans was almost annually affected by epidemics for the forty years preceding the epidemic of 1853, and that the children and negroes had it as they grew up, we cannot take this table as a fair estimate of mortality from the proportion of the population.

The following is a table of recoveries and deaths of the number attacked, according to race, color, condition, age, sex, habits, occupation and complication with other diseases, made up from my own observations and general reading :—

	Recovered.
1. Consumptives (in suppurating stage)	1 in 20
2. Drunkards (habitual)	1 " 10
3. Washerwomen (laundresses)	1 " 5
4. Syphilis (tertiary)	1 " 3
5. Catholic Priests	1 " 2
6. Doctors	5 " 8
7. Ministers of Protestant Churches	3 " 5
8. Blacksmiths, hatters, engineers	4 " 5
9. Adults, in most epidemics, male and female	5 " 6
10. Adult males, in most epidemics	4 " 6
11. Adult females, in most epidemics	6 " 7
12. Children, in most epidemics	9 " 10
13. Negroes " "	7 " 8
14. Number of those who escape that remain exposed to an epidemic during the entire season	1 " 20
15. Number of supposed second attacks	1 " 200

It will be seen that fewer consumptives recover than any other class; next, confirmed drunkards die oftener of uræmia and black vomit, and are less under the control of medicines. Washerwomen rarely escape, according to all authors, showing the infectious, or, if you please, the septicæmic character of the disease. Priests—many die from same cause, attending the patient in last hours, and administering extreme unction. In syphilitic cases the system is broken down, and sloughs and hemorrhages will occur at syphilitic eruption.

TABLE—*Showing the Number of Cases in which Yellow Skin was observed on different days of Yellow Fever, the Number of Deaths, and Rate of Mortality for each day.*—(From Blair.)

Day of Disease	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Unascertained.
Total No. of Cases	8	16	46	89	86	66	30	18	7	8	5	...	...	3	1	2
No. of Deaths.....	1	4	18	44	53	27	13	10	1	3	2	...	...	.....	1	1
Rate of Mortal'y	12.5	25.0	39.01	49.45	61.62	40.90	43.33	55.55	14.28	37.5	40.	...	...	.....	...	.....
Rate per cent. of Symptoms.....	0.38	0.76	2.22	4.20	4.15	3.14	1.45	0.87	0.34	0.38	0.29	...	...	0.14	...	.....

Yellow Skin and Black Vomit.—(From Blair.)

122 DEATHS.						22 RECOVERIES.					
40 Cases Simultaneous.		45 Cases Preceded.		22 Cases Succeeded.		6 Cases Simultaneous.		6 Cases Preceded.		10 Cases Succeeded.	
Day of Disease.	Number of Cases.	Number of Days preceded.	Number of Cases.	Number of Days succeeded.	Number of Cases.	Day of Disease.	Number.	Number of Days preceded.	Number of Cases.	Number of Days.	Number of Cases.
3d.....	3	1	28	1	25	3	1	1	3	1	5
4th.....	14	2	10	2	4	4	1	2	2	2	2
5th.....	9	3	5	3	2	5	2	4	1	3	2
6th.....	10	4	1	7	1	6	2	.....	.....	4	1
7th.....	3	5	1	.....	.....	.....	.....	.....	.....	.....	.....
8th.....	1	0	0	.....	.....	.....	.....	.....	.....	.....	.....

TABLE OF LOCALITIES IN THE UNITED STATES WHERE YELLOW FEVER HAS APPEARED SINCE A. D. 1668.

With their Elevations above the Sea-level; Dates of Commencement and Suspension of the Disease; Mortality; and Authorities for the Statements.

State.	Locality.	Situation.	Elevation, in feet, above sea-level.	Date of commencement. Year.	Date of commencement. Month.	Date of suspension. Year.	Date of suspension. Month.	Mortality.	Authority.
Alabama.....	Blakely, Baldwin Co.....	On Tensaw River.....	25	1822	.....	.....	.....	.....	Drake, Principal Diseases of Interior Valley, North America, p. 225.
	Cahawba, Dallas Co.....	On Alabama River.....	175	1853	.....	.....	.....	.....	E. H. Barton, Report Sanitary Commission of New Orleans, 1857, p. 65.
	Citronelle, Mobile Co.....	On Mobile and Ohio Railroad.	65	1853	.....	.....	.....	.....	J. C. Nott, N. O. M. & S. J., 1854, p. 571.
	Dog River Cotton Factory.	Five Miles from Mobile.....	30	1853	Aug. 8.	.....	.....	.....	C. Whattleworth, Ch. M. J. & Rev., 1859, p. 479.
	Demopolis, Marengo Co...	On Tombigbee River.....	125	1853	.....	.....	.....	.....	E. D. Fenner, History of Epidemic Yellow Fever, 1853, p. 49.
	Fort Claiborne, Monroe Co.	Alabama River.....	75	1819	July 4.	1819	Dec. 1.	.....	Harvey E. Brown (Asst. Surg. U. S. A.), Quarantine, on the Southern and Gulf Coasts, 1872.
	Fort Morgan Island.....	Mobile Bay.....	20	1867	Aug. 13.	.....	.....	.....	Brown, Quarantine, p. 44.
	Fort St. Stephens, Washington Co.....	Tombigbee River.....	75	1819	July 4.	1819	Dec. 1.	.....	Dowler, Yellow Fever of 1853, p. 16.
	Hollywood.....	Tombigbee River.....	75	1853	.....	.....	.....	.....	E. H. Barton, Report Sanitary Commission of New Orleans, 1857, p. 65.
	Mobile, Mobile Co.....	Mobile Bay.....	20	1705	.....	.....	.....	.....	P. H. Lewis, N. O. M. J., 1845, vol. 1, No. 4, p. 283.
				1765	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 216.
				1766	.....	.....	.....	.....	P. H. Lewis, N. O. M. J., vol. 1, No. 4, 1845, p. 283.
				1819	Aug. 15.	.....	Nov. —	274	P. H. Lewis, N. O. M. J., vol. 1, No. 4, 1845, p. 284.
				1821	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 191.
				1822	.....	.....	.....	.....	Do.
				1824	.....	.....	.....	.....	Do.
				1825	Sept. —	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 219.
				1827	Aug. —	.....	.....	.....	Do.
				1828	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 191.
				1829	Sept. 14.	.....	.....	130	Drake, Dis. Int. Valley of N. A., p. 220.
				1837	Sept. 20.	1837	Nov. —	350	Do.
				1838	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 191.
				1839	Aug. 11.	1839	Oct. 20.	650	Drake and Brown, Quarantine, 1872.
				1841	.....	.....	.....	.....	J. H. Lewis, N. O. M. J., 1844, p. 31.
				1842	Aug. 20.	.....	.....	60	Drake, p. 222, and Brown, Quarantine, 1872.
				1843	Aug. 18.	1843	Nov. 5.	240	Do.
				1844	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 191.
				1847	.....	.....	.....	76	Brown, Quarantine, and Fenner's South. Med. Reports, vol. 2, p. 304.
				1848	.....	.....	.....	75	Fenner, South. Med. Reports, vol. 2, p. 304.
				1849	.....	.....	.....	50	Do.
				1851	.....	.....	.....	.....	Brown, Quarantine, 1872, p. 43.
				1853	July 13.	1853	Nov. 1.	115	N. O. M. & S. J., 1854, p. 571.

				1854	.....	.....	.....	.....	Ed. Nash., J. M. & S., 1854, p. 345.
				1858	.....	.....	.....	.....	Ed. Va. M. J., 1858, p. 517.
	Montgomery, Montgomery Co.....	On Alabama River.....	150	1867	Aug. 13.	.....	.....	.....	Brown, Quarantine, 1872, p. 44.
				1853	Sept. —	.....	Nov. —	35	R. F. Michel, Charleston Med. Journal and Review, vol. 1, No. 4, 1874, p. 303.
				1854	Sept. —	.....	Nov. —	45	Do.
				1855	Sept. —	.....	Nov. —	30	Do.
				1873	Sept. 4.	.....	Nov. 10.	102	R. F. Michel, Charleston Med. Journal and Review, vol. 1, No. 4, 1874, p. 289.
				1870	Aug. 22.	1870	Nov. 19.	.....	G. A. Ketchum, Trans. A. M. S., 1871, p. 269.
				1873	Aug. 21.	1873	Nov. 29.	27	O. L. Crampton, Report Supervising Surgeon (J. M. Woodworth), U. S. Marine Hospital Service, 1873.
	Pollard, Escambia Co.....	.....	60	1873	.....	.....	.....	.....	J. Jones, B. M. & S. J., 1873, p. 543.
	Selma, Dallas Co.....	On Alabama River.....	200	1853	Sept. 17.	1853	Nov. 13.	32	J. C. Marks, N. O. M. & S. J., 1854, p. 88.
	Spring Hill, Mobile Co....	Six miles west of Mobile.....	50	1853	.....	.....	.....	.....	J. C. Nott, Ch. M. J. & Rev., 1859, p. 476.
Arkansas.....	Columbia, Chicot Co.....	On Mississippi River.....	145	1853	June —	.....	.....	.....	Trans. A. M. A., 1854, p. 526.
	Fort Smith, Sebastian Co..	On Arkansas River.....	460	1823	.....	.....	.....	.....	Dowler, Tableau of Yellow Fever, p. 24.
	Grand Lake, Chicot Co....	On Mississippi River.....	130	1853	.....	.....	.....	.....	D. N. Jones, N. O. M. & S. J., 1853, p. 328.
	Little Rock, Pulaski Co...	On Arkansas River.....	350	1873	.....	.....	.....	.....	Washington Republican, vol 13, No. 280, p. 1.
	Napoleon, Desha Co.....	On Mississippi River.....	142	1853	.....	.....	.....	.....	E. D. Fenner, His. Epi. Yellow Fever, 1853, p. 49.
Connecticut....	Chatham, Middlesex Co...	On Connecticut River.....	200	1796	Aug. 29.	.....	.....	.....	Miner and Tully on Fevers, p. 357.
	Hartford, Hartford Co.....	On Connecticut River.....	60	1798	.....	.....	.....	.....	Brown, Quarantine, p. 8.
				1800	.....	.....	.....	.....	M. Repos., 1800, p. 197.
	Knowles' Landing.....	On Connecticut River.....	25	1796	Aug. —	.....	.....	9	N. Y. M. & Ph. J., 1822, p. 153.
	Middletown, Middlesex Co	On Connecticut River.....	40	1820	June —	.....	.....	.....	W. Tully, N. Y. M. & Ph. J., 1822, p. 153.
	New Haven, New Haven Co.	On Connecticut River.....	35	1794	.....	.....	.....	.....	W. Hume, Ch. M. J. & Rev., 1860, p. 24.
				1803	.....	.....	.....	.....	Brown, Quarantine, 1872, p. 9.
				1804	.....	.....	.....	.....	Do.
				1805	.....	.....	.....	.....	Dowler, Tableau of Yellow Fever, p. 13.
				1743	.....	.....	.....	.....	Daily Shreveport Times, vol. 2, No. 34, 1873.
				1819	.....	.....	.....	.....	F. Pascalis, M. Repos., 1820, p. 239.
	New London, New London Co.....	On Thames River, 3 miles from ocean.....	25	1798	Aug. 26.	.....	Nov. —	81	Ed. M. Repos., 1799, p. 211.
	Norwalk, Fairfield Co.....	On Norwalk River.....	25	1798	.....	.....	.....	.....	J. Gotham, Jr., M. Reporter, 1856, p. 563.
	Stamford, Fairfield Co.....	On Long Island Sound.....	20	1745	.....	.....	.....	.....	
	Stonington, New London Co	On Long Island Sound.....	20	1798	.....	.....	.....	.....	J. Comstock, M. Repos., 1807, p. 23.
Delaware.....	Christiana, Newcastle Co..	On Christiana Creek.....	20	1798	.....	.....	.....	.....	J. Vaughan, Med. Repos., 1800, p. 372.
	Duck Creek, Newcastle Co.	Near Delaware Bay.....	20	1798	.....	.....	.....	.....	J. Stephens, Med. Mus., 1809, p 153.
	Newcastle, Newcastle Co..	On Delaware River.....	25	1798	.....	.....	.....	.....	Do.
	Wilmington, Newcastle Co	On Christiana Creek, 2 miles from Delaware River.....	45	1798	.....	.....	.....	255	Do.
				1802	.....	.....	.....	86	Med. Repos., 1803, p. 235.
Florida.....	Apalachicola, Franklin Co.	On Apalachicola Bay.....	15	1826	.....	.....	.....	.....	Drake, Diseases Int. Valley N. A.
	Cedar Keys, Levy Co.....	Isles of the Ocean.....	15	1871	.....	.....	.....	.....	Brown, Quarantine, p. 42.
	Gainesville, Alachua Co...	.....	160	1871	Aug. —	.....	.....	.....	Do.
	Jacksonville, Duval Co....	On Saint John's River.....	14	1857	.....	.....	.....	.....	B. M. Robertson, Ch. M. J. & Rev., 1858, p. 45.
	Key West, Monroe Co.....	On an island in the sea.....	15	1824	.....	.....	.....	.....	F. Ticknor, N. A. M. & S. J., 1827, p. 213.
				1829	.....	.....	.....	.....	C. C. Dupré, Am. J. of Med. Sci., 1841, p. 380.
				1841	June —	.....	.....	26	Do.
				1853	Aug. —	1854	Aug. —	112	Army Medical Statistics, p. 323.
				1854	.....	.....	.....	.....	Ed. N. O. M. & S. J., 1854, p. 423.
				1862	June 20.	.....	Oct. —	71	Ed. Med. and Surg. Reporter, 1864, p. 513.
				1864	.....	.....	.....	.....	E. B. Hunt, Med. Reporter, 1864, p. 340.
				1865	.....	.....	.....	.....	Brown, Quarantine, p. 40.
				1867	.....	.....	.....	.....	Surgeon-General's Office, Circular No. 1, 1868, p. 152.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

STATE.	Locality.	Situation.	Elevation, in feet, above sea-level.	DATE OF COMMENCEMENT. Year.	DATE OF COMMENCEMENT. Month.	DATE OF SUSPENSION. Year.	DATE OF SUSPENSION. Month.	Mortality.	AUTHORITY.
Florida.....	Milton, Santa Rosa Co.....	On Blackwater River, near Pensacola Bay.....	20	1869	.....	.....	.....	.....	Brown, Quarantine, p. 41.
				1853	.....	.....	.....	.....	Brown, Quarantine, p. 38.
				1855	.....	.....	.....	.....	Do.
	Pensacola, Escambia Co...	On Pensacola Bay.....	15	1764	.....	.....	.....	....	P. S. Townsend, N. Y. M., and Ph. J., 1823, p. 315.
				1765	.....	.....	.....	125	Drake, Dis. Int. Valley of N. A., p. 190.
				1811	.....	.....	.....	.....	Do.
				1822	Aug. 12.	.....	Oct. 10.	257	Drake, Dis. Int. Valley of N. A., p. 229.
				1825	.....	.....	.....	.....	Brown, Quarantine, p. 36.
				1827	.....	.....	.....	.....	Med. Statistics, United States Army, p. 58.
				1834	Aug. 23.	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 232.
				1839	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 233.
				1841	.....	.....	.....	.....	Do.
				1842	.....	.....	.....	.....	S. C. Laurason, Maryland M. & S. J., 1843, p. 393.
				1843	.....	.....	.....	.....	Dr. Wedderburn, Report of San. Com., p. 125
				1844	.....	.....	.....	.....	Do.
				1845	.....	.....	.....	.....	Brown, Quarantine, p. 36.
				1846	.....	.....	.....	.....	Do.
				1847	.....	.....	.....	.....	Dr. Wedderburn, Report of San. Com., p. 125.
				1848	.....	.....	.....	.....	Dr. Wedderburn, Report of San. Com. of N. O., p. 125.
				1853	July 9.	.....	.....	.....	E. D. Fenner, His. of Yellow Fever, N. O., 1853, p. 49.
				1854	.....	.....	.....	.....	R. B. S. Hargis, N. O. M. N., 1859, p. 727.
				1858	.....	.....	.....	.....	Do.
				1863	Aug. 25.	.....	.....	.....	B. F. Gibbs, A. J. M. Sc., 1866, p. 340.
				1867	July 24.	.....	.....	34	M. Reporter, 1868, p. 227.
				1873	Aug. 6.	.....	.....	61	R. F. Michel, Charleston M. J. and R., 1874, vol. 1, No. 4, p. 289.
	St. Augustine, St. John's Co.....	On Matanzas Sound, two miles from the sea.....	10	1807	.....	.....	.....	.....	Brown, Quarantine, p. 32.
				1821	Aug. —	.....	.....	140	J. Gotham, M. Reporter, 1856, p. 564.
				1838	.....	.....	.....	.....	C. C. Dupré, A. J. Med. Sci., 1841, p. 384.
				1839	Aug. 15.	.....	.....	.....	Do.
				1841	.....	.....	.....	26	Do.
	Saint Joseph's, Calhoun Co	On Saint Joseph's Bay, near Gulf of Mexico.....	15	1841	.....	.....	.....	.....	B. M. and S. J., 1841, p. 17.
	Suwanee, Columbia Co....	On Suwanee River.....	50	1836	.....	.....	.....	.....	T. Lawson, Surg. Gen. Report, 1840, p. 308.
	Tampa, Hillsborough Co..	Head of Tampa Bay, forty miles from the Gulf of Mexico.....	20	1871	.....	.....	.....	.....	Med. and Surg. Reporter, No. 17, p. 377, vol. 25.
				1839	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 191.
	Tortugas.....	Gulf of Mexico.....	12	1853	Sept. —	.....	.....	.....	Army Medical Statistics, p. 323.
				1862	.....	.....	.....	4	Circular No. 1, Surgeon General's Office, 1869.
	Pensacola.....	Pensacola Bay.....	.....	1867	July 4.	.....	.....	38	Brown, Quarantine, p. 46.
				1873	Aug. 14.	.....	Nov. 19.	62	John M. Woodworth, Supervising Surgeon, U. S. Marine Hospital Service, Report 1873.

Georgia.....	Augusta, Richmond Co....	On Savannah River.....	185	1839	.....	.....	.....	.....	B. M. and S. J., 1839, p. 86.
				1854	.....	.....	.....	.....	Ed. Nash, J. M and S., 1854, p. 345.
	Bainbridge, Decatur Co.,..	On Flint River.....	120	1873	.....	.....	.....	.....	Washington Republican, Oct. 25, 1873, p. 1.
	Saint Mary's, Camden Co.	On Saint Mary's River, nine miles from the sea.....	15	1808	Sept. 5.	.....	Oct. —	84	J. Seagrove, M. Rep., 1810, p. 135.
				1807	.....	.....	.....	.....	Dowler, Tableau of Yellow Fever, p. 14.
	Savannah, Chatham Co..	On Savannah River, eighteen miles from its mouth.....	30	1808	.....	.....	.....	.....	Do.
				1819	.....	.....	.....	.....	A. M. Rec., 1820, p. 212.
				1820	.....	.....	.....	.....	N. A. M. and S. J., 1827, p. 1.
				1827	.....	.....	.....	.....	N. A. Med. and S. J., vol. 10, p. 145.
				1852	.....	.....	.....	19	R. C. Mackall, Ch. M. J. and Rev., 1855, p. 150.
				1853	.....	.....	.....	.....	Do.
				1854	Aug. 5.	.....	.....	580	Hume, Charleston Med. J., vol. 10, p. 31.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 491.
Illinois	Cairo.....	At Junction of Ohio and Mississippi Rivers.....	322	1873	Sept. 1.	.....	Sept. 25.	17	H. Wardner, Report Supervising Surgeon U. S. Marine Hospital Service, 1873.
Louisiana	Louisville.....	On the Ohio River.....	450	1873	Sept. 22.	.....	Oct. 15.	5	P. H. Bailhache, *ibid.*
	Alexandria, Rapides Parish.....	On Red River.....	75	1819	.....	.....	.....	.....	G. S. D. Anderson, N. O. M. J., 1859, p. 508.
				1822	.....	.....	.....	.....	Do.
				1827	.....	.....	.....	.....	Do.
				1831	.....	.....	.....	.....	Do.
				1837	.....	.....	.....	.....	Do.
				1839	.....	.....	.....	.....	Do.
				1847	.....	.....	.....	.....	Do.
				1853	.....	.....	.....	.....	Do.
				1854	.....	.....	.....	.....	Do.
				1855	Sept. 13	.....	.....	.....	Do.
	Algiers.....	On Mississippi River, opposite New Orleans.....	10	1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1848, p. 192.
				1853	.....	.....	.....	.....	P. C. Gaillard, Ch. M. J. and Rev., 1859, p. 481.
				1858	.....	.....	.....	.....	N. O. M. J., 1859, p. 506.
	Ascension	On Mississippi River.....	25	1823	.....	.....	.....	.....	
	Baton Rouge.....	On Mississippi River.....	50	1817	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 250.
				1819	.....	.....	.....	.....	Do.
				1822	.....	.....	.....	60	Do.
				1827	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 191.
				1829	.....	.....	.....	.....	Do.
				1843	Oct. —	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 251.
				1837	.....	.....	.....	.....	Brown, Quarantine, p. 48.
				1847	.....	.....	.....	.....	N. O. M. and S. J , 1848, p. 536.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 491.
	Bay of Saint Louis.....	Mouth of the Mississippi River.....	10	1820	Aug. —	.....	.....	.....	A. P. Merrill, N. O. M. and S. J., 1851, p. 1.
				1830	.....	.....	.....	.....	N. O. M. and S. J., 1850, p. 79.
	Bayou Sara, West Feliciana Parish.....	On Mississippi River.....	75	1853	.....	.....	.....	.....	
				1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1848, p. 19.
				1853	.....	.....	.....	.....	P. C. Gaillard, Ch. M. J. and Rev., 1859, p. 481.
	Burat Settlement, (coast below New Orleans.).....	On Mississippi River.....	10	1854	Sept. 22.	.....	.....	.....	Brown, Quarantine.
	Carrollton, Jefferson Parish.....	On Mississippi River.....	15	1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1848, p. 192.
				1855	May 18.	.....	.....	1	D. Warren Brickell, N. O. M. N., 1855, p. 167.
	Centreville, Saint Mary's Parish.....	On Teche River, 60 miles from the Gulf of Mexico....	20	1853	Sept. 18.	.....	Nov. 18.	.....	W. B. Wood, N. O. M. N., 1856, p. 483.
				1855	Sept. —	.....	Oct. —	1	Do.
	Clinton, East Feliciana Parish.....	32 miles N. of Baton Rouge...	85	1853	Sept. 1	.....	Dec. —	75	B. Dowler, Tableau of Yellow Fever, 1853, p. 28.
	Cloutierville, Natchitoches Parish.....	On Old Riv. branch Red River	175	1853	Aug. 14.	.....	Dec. 14.	.....	Brown, Quarantine.
				1854	.....	.....	.....	.....	Do.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

State.	Locality.	Situation.	Elevation, in feet, above sea-level.	Date of commencement. Year.	Date of commencement. Month.	Date of suspension. Year.	Date of suspension. Month.	Mortality.	Authority.
Louisiana.....	Covington, Saint Tammany Parish.....	45 miles north of New Orleans.....	25	1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1848, p. 192.
	Donaldsonville, Ascension Parish.....	On Mississippi River.....	30	1827	.....	.....	.....	.....	
	Franklin, Saint Mary's Parish.....	On Teche River, 65 miles from the Gulf of Mexico.....	15	1839	.....	.....	.....	30	Drake, Dis. Int. Valley of N. A., p. 247.
				1853	Oct. 19.	.....	Nov. 24.	2	J. W. Lyman, N. O. M. and S. J., 1854, p. 670.
				1854	.....	.....	.....	.....	W. B. Wood, N. O. M. N., 1856, p. 483.
	Gretna.....	.....		1858	.....	.....	.....	.....	N. O. M. J., 1859, p. 506.
	Iberville, Iberville Parish.	On Mississippi River.....	18	....	.....	.....	.....	.....	
	Jeannerett's, Parish of Saint Mary.....	.....	15	1854	Oct. 7.	.....	.....	.....	Brown, Quarantine.
	Jesuit's Bend.....	Settlement on coast below New Orleans.....	10	1854	Sept. 12.	.....	.....	.....	Brown, Quarantine.
	La Fayette.....	Near New Orleans.....	12	1847	June 22.	.....	.....	.....	N. O. M. & S. J., 1848, p. 536.
	Lake Providence, Carroll Parish.....	On Mississippi River.....	100	1853	.....	.....	.....	.....	J. L. Ridell, N. O. M. and S. J., 1854, p. 813.
	Mandeville, St. Tammany Parish.....	On Lake Pontchartrain.....	15	1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., p. 192.
	McDonoughville.....	.....	.....	1858	.....	.....	.....	.....	N. O. M. J., 1859, p. 506.
	Natchitoches.....	On Red River.....	180	1839	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p 191.
	New Iberia, Saint Martin's Parish.....	Southern part of Louisiana...	20	1839	.....	.....	.....	.....	Drake, Dis. Int. Valley of N. A., p. 241.
				1867	.....	.....	.....	.....	Report New Orleans Board of Health, 1872, p. 68.
				1870	.....	.....	.....	.....	Brown, Quarantine, p. 58.
	New Orleans.....	On Mississippi River.....	10	1769	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858 p. 498.
				1791	.....	.....	.....	.....	Do.
				1793	.....	.....	.....	.....	Trans. A. M. A., vol. 2, p. 684.
				1794	.....	.....	.....	.....	Stethoscope, vol. 3, No. 11, 1853, p. 665.
				1795	.....	.....	.....	.....	Do.
				1796	.....	.....	.....	.....	Do.
				1797	.....	.....	.....	.....	Do.
				1799	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 498.
				1800	.....	.....	.....	.....	Do.
				1801	.....	.....	.....	.....	Do.
				1802	.....	.....	.....	.....	Dowler, Tableau of Yellow Fever, 1853, p. 12.
				1804	.....	.....	.....	.....	Chaillé, Va. M. J., 1858, p. 498.
				1809	.....	.....	.....	.....	Do.
				1811	.....	.....	.....	.....	Do.
				1812	.....	.....	.....	.....	Do.
				1817	June 18.	.....	Dec. —	800	S. Chaillé, Va. Med. J., 1858, p. 498.

			1818	.....	.....	115	M. M. Dowler, N. O. M. N., 1859, page 308.
			1819	July 1.	.....	2,190	S. Chaillé, Va. Med. J., 1858, p. 498.
			1820	July —	.....	.....	Do.
			1822	Sept. 1.	.....	239	Trans. A. M. A., 1851, p. 207, and Drake, p. 197.
			1823	Aug. 23.	.....	1	Do.
			1824	Aug. 4.	.....	108	Do.
			1825	June 23.	.....	49	Do.
			1826	May 18.	.....	5	Do.
			1827	July 19.	.....	109	Do.
			1828	June 18.	.....	130	Do.
			1829	May 23.	.....	215	Do.
			1830	July 15.	.....	117	Do.
			1831	June 9.	.....	2	Do.
			1832	Aug. 15.	.....	18	Do.
			1833	July 12.	.....	210	Do.
			1834	Aug. 28.	.....	95	Do.
			1835	Aug. 23.	.....	284	Do.
			1836	Aug. 24.	.....	5	Do.
			1837	July 24.	.....	442	Do.
			1838	Aug. 25.	.....	17	Do.
			1839	July 23.	.....	452	Do.
			1840	July 25.	.....	3	Do.
			1841	July 27.	.....	594	Do.
			1842	July 30.	.....	211	Do.
			1843	July 5.	.....	487	Do.
			1844	July —	..... Sept. —	148	Do.
			1845	.....	.....	2	Chaillé, Va. Med. J., 1856, p. 499.
			1846	Aug. —	..... Oct. —	160	Do.
			1847	Aug. —	..... Dec. —	2,259	Do.
			1848	June —	..... Nov. —	850	Do.
			1849	Aug. —	..... Dec. —	737	Do.
			1850	July —	..... Oct. —	102	Do.
			1851	.....	.....	16	Do.
			1852	July —	..... Dec. —	415	Do.
			1853	May —	..... Dec. —	7,970	Do.
			1854	July —	..... Dec. —	2,423	Do.
			1855	June —	..... Dec. —	2,670	Do.
			1856	Aug. —	..... Nov. —	74	Do.
			1857	June —	..... Dec. —	199	Do.
			1858	June —	..... Oct. 10.	3,889	Ed. Med. Rep., 1858, vol. 1, No. 4, p. 72.
			1862	.....	.....	.....	Fenner, S. J. of M. S., May, 1866.
			1863	.....	.....	.....	Chaillé, p. 8.
			1864	.....	.....	.....	Harris, Sanitary Commission, p. 264.
			1867	June 10.	..... Dec. 22.	3,093	Ed. N. O. M. J., 1868, p. 194.
			1870	May 16.	..... Dec. —	587	J. C. Fuget, N. O. Med. & S. J., vol. 1, No. 2, 1873.
			1871	Aug. 4.	..... Oct. —	55	Report N. O. Board of Health, 1871.
			1872	Aug. 28.	..... Nov. 30.	40	Report N. O. Board of Health, 1872, p. 17.
			1873	July 4.	..... Nov. 18.	225	Orsamus Smith, Report Supervising Surgeon, U. S. Marine Hospital Service, 1873.
New Orleans (small settlement on coast below.....	On Mississippi River.....	10	1854	.....	.....	.....	D. R. Fox, N. O. M. N., 1855, p. 409.
			1855	.....	.....	.....	Do.
Opelousas, Saint Landry Parish.....	Seven miles from the head of navigation on the Courtableau Bayou.....	60	1829	.. ..	.....	.....	Carpenter, Sketches, p. 26.
			1837	Oct. 20.	..... Nov. —	.....	T. A. Cooke, N. O. M. J., 1846, p. 27; Drake, p. 243.
			1839	Aug. —	..... Nov. —	.....	Do.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, *etc.*—Continued.

State.	Locality.	Situation.	Elevation, in feet, above sea-level.	Date of commencement. Year.	Date of commencement. Month.	Date of suspension. Year.	Date of suspension. Month.	Mortality.	Authority.
				1842	.....	.....	.....	.....	T. A. Cooke, N. O. M. J., 1846, p. 27; Drake, p. 243.
				1853	.....	.....	.....	.....	T. A. Cooke, South. Med. Rec., vol. 34, 1873, No. 4, p. 199.
Louisiana				1867	.....	.....	.....	.....	Do.
	Pattersonville, St. Mary's Parish	On Teche River	20	1853	Aug. 8.	.....	Dec. —	45	J. S. Grant, M. D., Report San. Com., 1853, p. 43.
				1854	Sept. —	.....	.....	.....	W. B. Wood, N. O. M. N., 1856, p. 483.
				1855	Sept. —	.....	.....	.....	Do.
	Plaquemine	On Mississippi River	6	1837	.....	.....	.....	.....	Drake, Dis. Int. Valley N. A., p. 191.
				1839	.....	.....	.....	.....	Do.
				1847	.....	.....	.....	.....	N. O. M. and S. J., 1848, p. 536.
				1853	Sept. —	.....	Oct. —	.....	J. B. Hacker, N. O. M. and S. J., 1854, p. 668.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 491.
	Point a la Hache, coast below New Orleans	On Mississippi River	8	1854	Oct. —	.....	.....	.....	Brown, Quarantine.
	Port Barre	.....	.....	1870	.....	.....	.....	.....	T. A. Cooke, South. Med. Rec., vol. 3, 1873, No. 4, p. 193.
	Port Hudson, East Feliciana Parish	On Mississippi River	75	1841	Oct. 13.	.....	.....	.....	Drake, Dis. Int. Valley N. A., p. 252.
				1843	.....	.....	.....	.....	Do.
				1839	.....	.....	.....	.....	Drake, Dis. Int. Valley N. A., p. 191.
	Saint Francisville	On Mississippi River	80	1811	.....	.....	.....	.....	Drake, Dis. Int. Valley N. A., p. 253.
	West Feliciana Parish	.....	.....	1817	.....	.....	.....	.....	Do.
				1819	.....	.....	.....	.....	Do.
				1823	.....	.....	.....	.....	Do.
				1827	.....	.....	.....	.....	Do.
				1829	Sept. 22.	.....	.....	.....	Do.
				1839	Aug. 28.	.....	.....	.....	Do.
				1843	Aug. 28.	.....	.....	.....	Do.
				1839	.....	.....	.....	1	P. B. McKelvey, N. O. M. and S. J., 1849, p. 64.
				1843	.....	.....	.....	.....	Do.
				1846	.....	.....	.....	1	Do.
				1848	.....	.....	.....	1	Do.
				1853	.....	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 26.
	Saint John Baptiste	On Mississippi River	20	1853	.....	.....	.....	.....	C. Delery, N. O. M. and S. J., 1853, p. 405.
	Saint Martinsville, Saint Martin's Parish	On Teche River	22	1839	.....	.....	.....	.....	Drake, Dis. Int. Valley, N. A., p. 191.
	St. Mary's Parish, (Judge Baker's plantation.)	On the Gulf of Mexico	15	1854	Sept. —	.....	Oct. —	.....	
	Shreveport, Caddo Parish.	On Red River	220	1853	Sept. —	.....	Dec. —	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 26.
				1873	Aug. 12.	.....	Nov. 10.	759	John M. Woodworth, Supervising Surgeon U. S. M. H. S., Report 1873.
	Thibodeaux, la Fourche, interior Parish	On Bayou la Fourche	15	1853	.....	.....	.....	160	B. Dowler, Tableau of Yellow Fever, 1853, p. 26.
				1854	Sept. 12.	.....	Oct. —	.....	M. A. McLeod, N. O. M. N., 1855, p. 454.

	Trenton, Washita Parish..	On Washita River.....	80	1846	Sept. 20.	.....	Oct. —	.....	W. A. Booth, N. O. M. and S. J., 1849, p. 65.
	Vidalia, Concordia Parish.	On Mississippi River.....	175	1853	.....	.....	.....	.....	T. P. Richardson, Report San. Com., p. 42.
	Ville Platte, Saint Landry Parish.....	On Teche Bayou	50	1853	Aug. —	.....	.....	.....	H. B. Shaw, Report San. Com., p. 57.
	Washington, Saint Landry Parish.....	Head of navigation on the Courtableau Bayou.....	65	1870	.....	.....	.....	.....	T. A. Cooke, South. Med. Rec., vol. 3, No. 4, p. 197.
				1837	.....	.....	.....	.....	T. A. Cooke, South. Med. Rec., vol. 3, No. 4, p. 199.
				1839	.....	.....	.....	.....	Do.
				1852	.....	.....	.....	.....	Do.
				1853	Aug. 15.	.....	.....	.....	T. A. Cooke, N. O. M. and S. J., 1854, p. 602.
				1854	.....	.....	.....	.....	T. A. Cooke, South. Med. Rec., vol. 3, No. 4, p. 196.
				1867	.....	.....	.....	.....	Do.
Maryland.....	Baltimore, Baltimore Co..	On Patapsco River	60	1794	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1795	.....	.....	.....	.....	
				1797	Aug. —	.....	Nov. —	.....	J. H. Griscom, Visitations of Yellow Fever, p. 8.
				1798	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1799	.....	.....	.....	.....	Do.
				1800	.....	.....	.....	.....	Do.
				1801	.....	.....	.....	.....	Do.
				1802	.....	.....	.....	.....	M. Reps., 1803, p. 100.
				1805	.....	.....	.....	.....	J. H. Griscom, Visitations of Yellow Fever, p. 13.
				1819	July 21.	.....	Oct. 30.	.....	D. M. Reese, Yellow Fever, 1819, p. 27.
				1820	.....	.....	.....	.....	H. G. Jameson, A. J. M. C., 1856, p. 372.
				1821	.....	.....	.....	.....	Do.
				1822	.....	.....	.....	.....	Do.
				1868	.....	.....	.....	.....	Brown, Quarantine, p. 14.
	West River (near Annapolis), Anne Arundel Co...	Near Chesapeake Bay.....	15	....	.....	.....	.....	.....	Stewart, Med. Mus., 1805, p. 362.
Massachusetts .	Boston, Suffolk Co.....	Head of Massachusetts Bay...	45	1691	.....	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 7.
				1693	.....	.....	.....	.....	Ed. N. Y. J. M., 1856, p. 278.
				1795	.....	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 7.
				1796	Aug. —	.....	.....	.....	J. H. Griscom, N. Y. J. M., 1856, p. 369.
				1798	.....	.....	.....	200	J. H. Griscom, N. Y. J. M., 1850, p. 369.
				1800	.....	.....	.....	.....	S. Emlen, N. A. M. and S. J., 1828, p. 321.
				1802	.....	.....	.....	60	J. Gotham, Med. Rep., 1856, p. 563.
				1805	.....	.....	.....	.....	J. H. Griscom, Visitations of Yellow Fever, p. 13.
				1819	.....	.....	.....	.....	S. Emlen, N. A. M. and S. J., 1828, p. 321.
				1858	.....	.....	.....	.....	F. E. Oliver, B. M. and S. J., 1858, p. 140.
	Holliston, Middlesex Co..	Inland, 25 miles from Boston.	75	1741	.....	.....	.....	15	
	Nantucket, Nantucket Co.	On an Island in the ocean.....	20	1763	.....	.....	.....	259	Med. Rep., 1853, p. 107.
	New Bedford, Bristol Co...	On Buzzard's Bay	25	1800	.....	.....	.....	.....	Brown, Quarantine, p. 9.
				1801	.....	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 11.
	Newburyport, Essex Co...	On Merrimac River.....	20	1796	.....	.....	.....	.....	J. H. Griscom, N. Y. J. M., 1856, p. 369.
	Salem, Essex Co.....	On an inlet of the sea.....	20	1798	.....	.....	.....	.....	J. Gotham, Jr., Med. Rep., 1856, p. 563.
Mississippi.....	Biloxi, Harrison Co.....	On Biloxi Bay	10	1702	.....	.....	.....	.....	Drake Dis. Int. Valley, N. A., 191.
				1839	.....	.....	.....	.....	Do.
				1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1848, p. 192.
				1853	.....	.....	.....	.....	J. C. Nott, N. O. M. and S. J., 1854, p. 571.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 491.
	Brandon, Rankin Co	Inland, 12 miles from Jackson, on branch of Pearl River....	300	1853	Sept. 15.	.....	.....	.....	Report Sanitary Commission, 1853, p. 77.
				1854	Sept. 23.	.....	Nov. 18.	.....	
	Canton, Madison Co.....	Inland, 25 miles from Jackson, near branch of Pearl River.	320	1855	.....	.....	.....	.....	Trans. A. M. A., 22, p. 201.
	Clifton, Jefferson Co.....	.....	175	1853	Aug. 28.	.....	Oct. —	.....	A. P. Jones, N. O. M. N., 1856, p. 182.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

State.	Locality.	Situation.	Elevation, in feet, above sea-level.	Date of commencement. Year.	Date of commencement. Month.	Date of suspension. Year.	Date of suspension. Month.	Mortality.	Authority.
Mississippi	Cooper's Wells, Hinds Co.	10 miles from Pearl River.....	275	1855	Aug. 23.	.....	.....	13	J. S. Beazley, N. O. M. N., 1856, p. 151.
	Grand Gulf, Claiborne Co.	On Mississippi River.....	200	1853	.....	.....	.....	.....	E. McAllister, N. O. M. and S. J., 1854, p. 675.
	Greenwood, Carroll Co....	On Yazoo River.....	140	1853	.....	.....	.....	9	Trans. A. M. A., 1854, p. 525.
	Jackson, Hinds Co.....	On Pearl River.....	275	1853	.....	.....	.....	.....	S. C. Farras, Stethoscope, 1855, p. 584.
				1854	.....	.....	.....	.....	Do.
	Natchez, Adams Co.....	On Mississippi River.....	150	1817	Sept. —	.....	Nov. 9.	9	Drake, Dis. Int. Valley, N. A., p. 263.
				1819	Sept. —	.....	Dec. —	180	Brown, Quarantine, p. 59.
				1823	Aug. 10.	.....	Oct. 18.	312	H. Tooley, History Yellow Fever, 1823, p. 25.
				1825	Aug. 20.	.....	Nov. 1.	150	Drake, Dis. Int. Valley, N. A., p. 269.
				1827	.....	.....	.....	.....	A. P. Merrill, Galv. M. J., 1867, p. 861.
				1829	Sept. 1.	.....	Nov. —	90	Drake, Dis. Int. Valley, N. A., p. 191.
				1837	Sept. 8.	.....	Nov. 25.	280	Do.
				1839	Sept. —	.....	Nov. —	235	Do.
				1844	.....	.....	.....	.....	Cartwright, N. O. M. and S. J., 1848, p. 225.
				1848	June —	.....	Nov. —	.....	C. H. Stine, N. O. M. and S. J., 1849, p. 549.
				1853	July 17.	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 26.
				1855	.....	.....	.....	.....	B. M. and S. J., 1855, p. 275.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 491.
	Pascagoula, Jackson Co...	On Pascagoula Bay.....	10	1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1868, p. 192.
				1853	.....	.....	.....	.....	J. C. Nott, N. O. M. and S. J., 1854, p. 571.
	Pass Christian, Harrison Co	Near Saint Louis Bay.....	15	1847	.....	.....	.....	.....	E. D. Fenner, N. O. M. and S. J., 1868, p. 192.
				1853	.....	.....	.....	.....	J. C. Nott N. O. M. and S. J., 1854, p. 571.
				1855	.....	.....	.....	.....	W. H. Calvert, N. O. M. and S. J., 1856, p. 80.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 491.
	Petit Gulf Hills, Jefferson Co.....	On Mississippi River.....	200	1853	.....	.....	.....	.....	A. P. Jones, N. O. M. N., 1854, p. 180.
	Port Gibson, Claiborne Co.	On Bayou Pierre.....	200	1853	.....	.....	.....	.....	E. McAllister, N. O. M. and S. J., 1854, p. 676.
	Rodney, Jefferson Co.....	On Mississippi River.....	175	1829	.....	.....	.....	.....	A. P. Jones, N. O. M. N., 1854, p. 180.
				1843	Sept. 6.	.....	.....	.....	C. B. New, West Lane, 1844, p. 301.
				1847	.....	.....	.....	.....	A. P. Jones, N. O. M. N., 1854, p. 180.
				1853	.....	.....	.....	.....	Do.
	Shieldsborough, Hancock Co	On Saint Louis Bay	10	1820	Aug. 20.	.....	.....	.....	Drake, Dis. Int. Valley N. A., p. 214.
				1829	Aug. 5.	.....	.....	.....	Do.
				1839	.....	.....	.....	.....	Do.
	Vicksburg, Warren Co....	On Mississippi River.....	175	1841	Sept. —	.....	Oct. —	.....	A. L. C. Magruder, N. O. M. J., 1838, p. 689.
				1847	.....	.....	.....	.....	Ed. West Lancet, 1853, p. 575.
				1839	.....	.....	.....	.....	Drake, Dis. Int. Valley N. A., p. 191.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., 1858, p. 49.
				1871	.....	.....	.....	.....	Med. and Surg. Rep., vol. 25, No. 16, p. 354.

	Washington, Adams Co...	Inland, near Natchez.....	175	1825	Aug. —	.....	Nov. —	52	J. W. Monnett, A. J. M. Sc., 1827 p. 243.
	Whitzell's Landing.....	Twenty miles below Natchez.	135	1817	.....	.....	.....	.....	Drake, Dis. Int. Valley, N. A., p. 190.
	Woodville, Wilkinson Co.	Fifteen miles east of the Mississippi River.....	100	1844	.....	.....	.....	.....	J. W. H. West, Lancet, 1844, p. 347.
				1852	.....	.....	.....	.....	P. C. Gaillard, Ch. M. J. and Rev., 1859, p. 480.
				1853	Aug. 9.	.....	.....	.....	A. C. Holt, N. O. M. N., 1856, p. 194.
				1855	Sept. —	.....	.....	.....	Do.
				1858	.....	.....	.....	.....	S. Chaillé, Va. M. J., p. 491.
	Yazoo City, Yazoo Co.....	On Yazoo River.....	140	1853	Sept. 1.	.....	.....	.....	Trans. A. M. A., 1854, p. 525.
Missouri.....	Saint Louis, St. Louis Co...	On Mississippi River.....	475	1854	.....	.....	.....	.....	Ed. Nash, J. M. and S., 1854, p. 345.
				1855	Aug. 14.	.....	.....	.....	W. Webb, N. O. M. N., 1856, p. 52.
	New Design, St. Louis Co..	Twenty miles below Saint Louis.....	420	1797	.....	.....	.....	57	Dr. Watkins, M. Repos., 1801, p. 74.
N. Hampshire..	Portsmouth, Rockingham Co.....	On Piscataqua River, three miles from the ocean.....	40	1798	Aug. —	.....	Oct. —	100	Med. Repos., 1799, p. 211.
New Jersey.....	Bridgeton, Cumberland Co.	On Cohansey Creek, twenty miles from Delaware Bay...	50	1798	.....	.....	.....	.....	J. H. Griscom, Visitations of Yellow Fever, p. 9.
	Gloucester City, Camden Co.....	On Delaware River.....	20	1805	.....	.....	.....	.....	
	Perth Amboy, Middlesex Co.....	On Raritan Bay.....	20	1811	.....	.....	.....	5	J. Gotham, M. Rep., 1856, p. 564.
	Port Elizabeth, Cumberland Co.....	On Maurice River.....	20	1798	Aug. 9.	.....	Sept. —	6	G Lee, M. Repos., 1800, p 246.
	Woodbury.....	.....	.....	1798	.....	.....	.....	.....	J. H. Griscom, Visitations of Yellow Fever, p. 9.
New York.....	Albany.....	On Hudson River.....	85	1746	Aug. —	.....	.....	45	J. H. Griscom, Visitations of Yellow Fever, p. 4.
				1798	.....	.....	.....	.....	J. Gotham, Jr., M. Rep., 1856, p. 563.
	Bay Ridge, Long Island...	.....	20	1856	.....	.....	.....	.....	C. D. Griswold, B. M. and S. J., 1858, p. 214.
	Brooklyn, Kings Co.....	A seaport.....	40	1809	July —	.....	Sept. —	40	Gillespie, Amer. Med. and Philo. Reg., vol. 3, p. 101, Ed. N. Y. J. M., 1856, p. 278.
				1823	.....	.....	.....	.....	Carpenter, Sketches of Yellow Fever.
				1856	July 14.	.....	.....	.....	3d Nat'l Quarantine & Sanitary Convention, p. 41.
	Catskill, Greene Co.....	On Hudson River.....	50	1743	.....	.....	.....	.....	
				1794	.....	.....	.....	.....	
				1803	Aug. 10	.....	Sept. 28.	8	B. W. Dwight, M. Reps.
	Governor's Island.....	New York Harbor.....	25	1856	July 29.	.....	.....	.....	3d Nat'l Quarantine & Sanitary Convention, p. 41.
				1870	Sept. —	.....	Oct. 26.	49	Report Board of Health, New York, 1870, p. 29.
	Gowanus, Kings Co.....	On Gowanus Cove, near York Harbor.....	15	1856	.....	.....	.....	.....	Va. M. J., 1856, p. 328.
	Greenfield, Saratoga Co...	Far inland	150	1798	.....	.....	.....	.....	J. G. Scott, M. Repos., 1807, p. 291.
	Huntington, Suffolk Co...	Huntington Bay.....	20	1795	.....	.....	.....	.....	Dr. D. Hosack, M. and Philos Reg., 1813, p. 191.
				1798	.....	.....	.....	.....	Do.
	New York, New York Co..	A seaport.....	35	1668	.....	.....	.....	.....	J. H. Griscom, M. Rep., 1856, p. 561.
				1702	.....	.....	Sept. 30.	570	J. H. Griscom, Visitations of Yellow Fever, p. 2.
				1732	.....	.....	.....	.....	J. H. Griscom, Visitations of Yellow Fever, p. 3.
				1741	.....	.....	.....	.....	Ed. N. Y. J. M., 1856, p. 278.
				1742	.....	.....	.....	.....	Do.
				1743	.....	.....	.....	217	J. H. Griscom, Visitations of Yellow Fever, p. 3.
				1745	.....	.....	.....	.....	Do.
				1747	.....	.....	.....	.....	J. H. Griscom, Visitations of Yellow Fever, p. 4.
				1748	.....	.....	.....	.....	Daily Shreveport Times, vol. 2, No. 811, 1873.
				1762	.....	.....	.....	.....	Do.
				1790	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1791	Aug. —	.....	Oct. 15.	.....	Ed. N. Y. J. M., 1856, p. 278, and Brown, Quarantine, p. 6.
				1792	.....	.....	.....	.....	Ed. N. Y. J. M., 1856, p. 278.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

STATE.	Locality.	Situation.	Elevation, in feet, above sea-level.	DATE OF COMMENCEMENT.		DATE OF SUSPENSION.		Mortality.	AUTHORITY.
				Year.	Month.	Year.	Month.		
New York.....	New York, New York Co..	A seaport.....	35	1793	.....	.....	.....	.....	Ed. N. Y. J. M., 1856, p. 278.
				1794	.....	.....	.....	.....	Do.
				1795	July 19.	.....	.....	730	Bayley's Account of Epidemic Fever, 1795.
				1796	.....	.....	.....	.....	Ed. N. Y. J. M., 1856, p. 278.
				1797	.....	.....	.....	.....	Do.
				1798	Aug. —	.....	Nov. —	2,080	Do.
				1799	July —	.....	Nov. —	76	Do.
				1800	Sept. —	.....	Oct. 14.	*21	Do.
				1801	Sept. —	.....	Oct. —	*16	Do.
				1802	.....	.....	.....	*2	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1803	July 18.	.....	Oct. —	6-700	Ed. N. Y. J. M., 1856, p. 278.
				1805	June —	.....	Oct. —	340	J. H. Griscom, M. Rep., 1856, p. 561.
				1806	June —	.....	Nov. —	*0	Ed. N. Y. J. M., p. 278.
				1807	.....	.....	.....	*3	J. H. Griscom, M. Rep., 1856, p. 561.
				1808	.....	.....	.....	*1	Ed. N. Y. J. M., 1856, p. 284.
				1809	.....	.....	.....	*2	Do.
				1810	.....	.....	.....	*1	Do.
				1815	.....	.....	.....	*7	Do.
				1816	.....	.....	.....	*0	Do.
				1817	.....	.....	.....	*4	Ed. N. Y. J. M., 1856, p. 281.
				1818	.....	.....	.....	*4	Do.
				1819	Aug. —	.....	.....	37	Do.
				1820	.....	.....	.....	*2	Do.
				1821	.....	.....	.....	*16	Do.
				1822	July 10.	.....	Nov. 5.	230	Do.
				1823	.....	.....	.....	*5	Do.
				1824	.....	.....	.....	*8	Do.
				1825	.....	.....	.....	*1	Do.
				1826	.....	.....	.....	*2	Do.
				1827	.....	.....	.....	*4	Do.
				1828	.....	.....	.....	*0	Do.
				1829	.....	.....	.....	*0	Do.
				1830	.....	.....	.....	*1	Do.
				1832	.....	.....	.....	*1	Do.
				1833	.....	.....	.....	*2	Do.
				1834	.....	.....	.....	*1	Do.
				1835	.....	.....	.....	*2	Do.
				1838	.....	.....	.....	*8	Ed. N. Y. J. M., 1856, p. 284.
				1839	.....	.....	.....	*4	Do.
				1843	.....	.....	.....	*5	Do.
				1844	.....	.....	.....	*2	Do.

				1846	.....	.....	.....	*0	Ed. N. Y. J. M., 1856, p. 284.
				1847	.....	.....	.....	*0	Do.
				1848	Aug. 12.	.....	.....	*12	Do., and Trans. A. M. A., vol. 7, p. 162.
				1852	.....	.....	.....	*1	Ed. N. Y. J. M., 1856, p. 284.
				1853	.....	.....	.....	*14	Do.
				1854	.....	.....	.....	*20	Do.
				1855	.....	.....	.....	*5	Do.
				1872	.....	.....	.....	.....	B. M. and S. J., vol. 80, No. 23, p. 587.
				1873	May 23.	.....	Oct. 30.	18	Heber Smith, Report Sup. Surg. U. S. M. H. S., 1873.
	Queensborough, Orange Co	.....	.....	1801	.....	.....	.....	.....	J. G. Scott, M. Repos., 1807, p. 202.
	Red Hook, Dutchess Co....	On Hudson River.....	30	1856	.....	.....	.....	.....	Va. M. J., 1856, p. 328.
	Stapleton, Staten Island, Richmond Co.....	New York Bay.....	20	1848	Aug. 23.	.....	.....	.....	A. B. Whiting, Ch. M. J. and Rev., 1848, p. 613.
	Tompkinsville, Staten Island, Richmond Co.....	do.....	20	1848	Aug. 23.	.....	.....	.....	Do.
	West Neck, Suffolk Co....	.....	18	1795	.....	.....	.....	.....	Dr. D. Hosack, M. and Philos. Reg., 1813, p. 191.
	West Point, Orange Co....	On Hudson River.....	25	1804	.....	.....	.....	.....	J. G. Scott, M. Repos., 1807, p. 242.
	Yellow Hook.....	.....	20	1856	.....	.....	.....	.....	Va. M. J., 1856, p. 328.
North Carolina.	Beaufort, Carteret Co.....	Newport River, near the sea.	8	1854	.....	.....	.....	.....	
				1864	Sept. 24.	.....	Nov. 17.	68	Official Report, U. P. Rice, 1864.
				1871	.....	.....	.....	.....	
	New Berne, Craven Co.....	On Neuse River.....	20	1799	.....	.....	.....	.....	M. Repos., 1800, p. 197.
				1864	Sept. —	.....	Nov. —	700	Report Medical Inspector U. S. A., Dec. 31, 1864.
	Smithville, Brunswick Co.	On Cape Fear River, near the ocean.....	15	1862	.....	.....	.....	.....	W. T. Wragg, N. Y. M. J., vol. ix, No. 5, 1859, p. 49.
	Washington, Beaufort Co.	On Tar River, 40 miles from Pamlico Sound.....	35	1800	.....	.....	.....	.....	M. Repos., 1800, p. 197.
	Wilmington, New Hanover Co.....	On Cape Fear River, 34 miles from the sea.....	25	1796	.....	.....	.....	.....	J. H. Griscom, N. Y. J. M., p. 369.
				1800	.....	.....	.....	.....	M. Repos., 1800, p. 197.
				1821	Aug. 9.	.....	.....	.....	J. Hill, A. M. Rec., 1822, p. 86, and Brown, Quarantine, p. 18.
				1862	Aug. 6.	.....	Nov. 17.	446	W. T. Wragg, N. Y. J. M., 1869, p. 478, and 1869, p. 225.
Ohio.....	Cincinnati, Hamilton Co..	On Ohio River.....	550	1871	.....	.....	.....	.....	Med. and Surg. Rep., vol. 25, No. 16, p. 354.
				1873	.....	.....	.....	.....	Health Office Report.
	Gallipolis, Gallia Co.....	do.....	520	1796	.....	.....	.....	.....	A. Ellicott, M. Repos., 1801, p. 74.
Pennsylvania..	Bald Eagle Valley, Clinton Co.....	Centre of Pennsylvania, on West Branch of Susquehanna River.....	550	1799	.....	.....	.....	.....	W. Harris, M. Repos., 1801, p. 75.
	Chester, Delaware Co.....	On Delaware River.....	25	1798	.....	.....	.....	50	J. H. Griscom, Visitations of Yellow Fever, p. 9.
	Chester County.....	.....do.....	.....	1805	.....	.....	.....	.....	Dowler, Tables of Fever, p. 13.
	Kensington, Philadelphia Co.....	.....do.....	15	1793	.....	.....	.....	.....	La Roche, Yellow Fever, p. 68.
	Lisburn, Cumberland Co..	On Yellow Breeches Creek, 9 miles from Harrisburg.....	250	1803	Aug. —	.....	.....	.....	W. Baldwin, Med. Mus., 1805, p. 601.
	Marcus Hook, Delaware Co.....	On Delaware River.....	15	1798	.....	.....	.....	.....	J. Rush, Med. Mus., 1805, p. 62.
	Nittany, Centre Co.....	Far inland.....	550	1799	.....	.....	.....	.....	W. Harris, Med. Repos., 1860, p. 75.
	Philadelphia, Philad'a Co.	On Delaware River.....	35	1695	.....	.....	.....	.....	J. N. Schoolfield, Va. M. J., 1857, p. 358.
				1699	Aug. 1.	.....	.....	220	R. La Roche, Ch. M. J. and Rev., 1852, p. 58.
				1732	.....	.....	.....	.....	Daily Shreveport Times, vol. 2, No. 311, 1873.
				1741	.....	.....	.....	250	J. H. Griscom, Visitations of Yellow Fever, p. 3.

* Star indicates the reports of deaths at the Marine Hospital, N. Y., for the respective years.—Ed. N. Y. J. M., 1856, p. 284.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

STATE.	Locality.	Situation.	Elevation, in feet, above sea-level.	DATE OF COMMENCEMENT. Year.	DATE OF COMMENCEMENT. Month.	DATE OF SUSPENSION. Year.	DATE OF SUSPENSION. Month.	Mortality.	AUTHORITY.
Pennsylvania..	Philadelphia, Philad'a Co.	On Delaware River.....	35	1742	.....	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, p. 3.
				1743	.....	.....	.....	.....	Do.
				1744	.....	.....	.....	.....	R. La Roche, Ch. M. J. and Rev., 1852, p. 458.
				1747	.....	.....	.....	.....	Do.
				1762	Aug. —	.....	Nov. —	.....	J. H. Griscom, Visitations of Yellow Fever, p. 5.
				1791	.....	.....	.....	.....	
				1793	Aug. —	.....	Dec. —	4,041	Carey, Account of the Malignant Fever, p. 116.
				1794	.....	.....	.....	.....	La Roche, Board of Health Rep., Phila., 1870, p. 53.
				1796	.....	.....	.....	.....	J. H. Griscom, N. Y. J. M., 1856, p. 369, and 1856, p. 368.
				1797	Aug. 1.	.....	Oct. 15.	1,300	Rush, Epidemic of 1797.
				1798	Aug. 1.	.....	Nov. 1.	3,500	Do.
				1799	July —	.....	Nov. —	1,000	R. La Roche, Ch. M. J. and Rev., 1872, p. 458.
				1800	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1801	.....	.....	.....	.....	Do.
				1802	.....	.....	.....	307	Do.
				1803	.....	.....	.....	195	Do.
				1805	.....	.....	.....	3–400	Do.
				1807	.....	.....	.....	3	B. Dowler, Tableau of Yellow Fever, 1853, p. 14.
				1809	.....	....	.....	.....	Do.
				1810	.....	.....	.....	3	Do.
				1811	.....	.....	.....	5	Do.
				1813	.....	.....	.....	6	Do.
				1814	.....	.....	.....	7	Do.
				1815	.....	.....	.....	2	Do.
				1816	.....	.....	.....	2	Do.
				1819	.....	.....	.....	13	S. Emlen, N. A. M. and S. J., 1828, p. 321.
				1820	July 24.	.....	.....	84	S. Jackson, A. M. Rec., 1821, p. 689.
				1853	July 19.	.....	Oct. —	128	W. Jewell, N. Y. J. M., 1854, pp. 149, 246, and Brown, Quarantine, p. 10.
				1854	.....	.....	.....	.....	Ed. Nash, J. M. and Surg., 1854, p. 345.
				1870	June 29.	.....	.....	18	La Roche, Yellow Fever, 1870, pp. 20, 26.
	Southwark, Philada'a Co..	On Delaware River.....	20	1793	.....	.....	.....	.....	La Roche, Yellow Fever, p. 68.
Rhode Island ..	Block Island.....	In Long Island Sound	20	1801	June —	.....	Dec. —	.....	Aaron C. Willey, M. Repos., 1803, p. 123.
	Bristol, Bristol Co.....	On Narragansett Bay.....	20	1795	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1796	.....	.....	.....	.....	Do.
				1797	.....	.....	.....	.....	Do.
	Newport, Newport Co.....	A port on Narragansett Bay..	20	1806	.....	.....	.....	.....	
	Providence, Providence Co	.....do	35	1794	.....	.....	.....	.....	B. Dowler, Tableau of Yellow Fever, 1853, p. 7.
				1795	.....	.....	.....	45	W. Hume, Ch. M. J. and Rev., 1860, p. 24.
				1797	Aug. 13.	.....	Aug. —	45	W. Hume, Ch. M. J. and Rev., 1860, p. 324.
				1800	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1860, p. 24.

	Westerly, Washington Co.	On Pawcatuck River.....	25	1805	July 19.	.....	Aug. —	.....	P. Bowen, Yellow Fever in Providence in 1805.
				1798	.....	.....	.....	.....	J. Comstock, M. Repos., 1807, p. 23.
				1805	.....	.....	.....	.....	Do.
South Carolina.	Charleston, Charleston district.....	A seaport.....	10	1699	.....	.....	.....	.....	Simons' Trans. S. C. Med. Ass'n, 1851, p. 37.
				1703	.....	.....	.....	.....	Do.
				1728	.....	.....	.....	.....	Do.
				1732	May —	.....	Sep. or Oct.	*8-12	Simons' Trans. S. C. Med. Ass'n, 1851, p. 37, and Trans. A. M. A., vol. 24, p. 291.
				1734	.....	.....	.....	.....	T. Harris, Phil. M. and P. J., No. 5, p. 21.
				1739	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1854, p. 145.
				1745	.....	.....	.....	.....	Do.
				1748	.....	.....	.....	.....	Do.
				1753	.....	.....	.....	.....	Do.
				1755	.....	.....	.....	.....	Do.
				1761	.....	.....	.....	.....	T. Harris, Phil. M. and Ph. J., 1805, p. 21.
				1762	.....	.....	.....	.....	Dawson & De Saussure, Census of Charleston.
				1768	.....	.....	.....	.....	M. M. Dowler, N. O. M. J., 1859, p. 305.
				1770	.....	.....	.....	.....	T. Harris, Phil. M. and Ph. J., 1805, p. 21.
				1792	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1852, p. 145, and Simons' Trans. Med. Ass'n, S. C., 1851, p. 38.
				1794	.....	.....	.....	.....	Do.
				1795	.....	.....	.....	.....	Do.
				1796	.....	.....	.....	.....	Do.
				1797	.....	.....	.....	.....	Do.
				1798	.....	.....	.....	.....	T. Y. Simons, Ch. M. J. and Rev., 1851, p. 779.
				1799	.....	.....	.....	239	W. Hume, Ch. M. J. and Rev., 1854, p. 145, and Simons' Trans. Med. Soc., S. C., 1851, p. 38.
				1800	.....	.....	.....	184	Do.
				1802	.....	.....	.....	96	Do.
				1803	.....	.....	.....	.....	Simons' Trans. S. C. Med. Ass'n, 1851, p. 37.
				1804	.....	.....	.....	148	Do.
				1805	.....	.....	.....	.....	Do.
				1807	.....	.....	.....	162	Simons' Trans. S. C. Med. Ass'n p. 38.
				1812	.....	.....	.....	.....	W. Hume, Ch. M. J. and Rev., 1854, p. 145.
				1817	July —	.....	Nov. —	272	Dowler, N. O. M. J., 1859, p. 597.
				1819	Aug. —	.....	Oct. —	177	Do.
				1822	June —	.....	Aug. —	2	Do.
				1824	Aug. —	.....	Nov. —	235	Do.
				1825	Aug. —	.....	Sept. —	2	Do.
				1827	Aug. —	.....	Nov. —	64	Do.
				1828	Aug. —	.....	Sept. —	26	Do.
				1830	Sept. —	.....	Nov. —	30	Do.
				1834	Aug. —	.....	Oct. —	49	Do.
				1835	Aug. —	.....	Sept. —	25	Do.
				1838	Aug. —	.....	Nov. —	351	Do.
				1839	June —	.....	Oct. —	134	Do.
				1840	Aug. —	.....	Oct. —	22	Do.
				†1841	.....	.....	.....	.....	Simons' Trans. S. C. Med. Ass'n, p. 59.
				1843	.....	.....	Nov. —	1	Dowler, N. O. M. J., p. 597.
				1849	Aug. —	.....	Nov. —	125	Do.
				1852	Aug. —	.....	Nov. —	310	Do.
				1854	Aug. —	.....	Nov. —	627	Do.
				1856	Aug. —	.....	Nov. —	211	Do.

* Died daily.

† Not within the incorporated limits of Charleston, South Carolina.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

STATE.	Locality.	Situation.	Elevation, in feet, above sea-level.	DATE OF COMMENCEMENT.		DATE OF SUSPENSION.		Mortality.	AUTHORITY.
				Year.	Month.	Year.	Month.		
South Carolina.	Charleston, Charleston district	A seaport	10	1857	Sept. —	.....	Nov. —	13	Dowler, N. O. M. J., p. 597.
				1858	July —	.....	Dec. —	717	Do.
				1862	.....	.....	.....	.....	Brown, Quarantine, p. 29.
				1864	July 27.	.....	.....	.....	Trans. A. M. A., vol. 23, p. 292.
				1871	July 19.	.....	Nov. —	213	Simons' Trans. A. M. A., vol. 23, p. 293.
	Beaufort, Beaufort district.	On an arm of the sea	10	1871	Aug. 6.	.....	Nov. 21.	7	Trans. A. M. A., vol. 23, p. 331.
	Columbia, Richland dist..	On Congaree River	175	1854	.....	.....	.....	.....	Ed. Nash, J. M. and S., 1854, p. 345.
	Fort Moultrie	In Charleston Harbor	15	1852	.....	.....	.....	...	M. M. Dowler, N. O. M. J., 1854, p. 305.
				1858	Aug. 15.	.....	.....	.....	Ch. M. J. and Rev., 1858, p. 844.
	Georgetown, Georgetown district	On Winyaw Bay	10	1854	Aug. 20.	.....	Oct. 28.	.....	W. C. Miller, Ch. M. J. and Rev., 1856, p. 19.
	Hilton Head	.....	10	1862	Sept. 8.	.....	Oct. 25.	.....	Brown, Quarantine, p. 30.
	Mount Pleasant, Charleston Co	On Winyaw Bay	10	1817	.....	.....	.....	.....	R. A. Kinloch, Ch. M. J. and Rev., 1858, p. 793.
				1848	.....	.....	.....	.....	Do.
				1852	.....	.....	.....	.....	Do.
				1854	.....	.....	.....	.....	Do.
				1856	.....	.....	.....	.....	Do.
				1857	.....	.....	.....	.....	Do.
Tennessee	Memphis, Shelby Co	On Mississippi River	260	1853	.....	.....	.....	.....	W. J. Tuck, N. O. M. and S. J., 1854, p. 662.
				1855	.....	.....	.....	.....	A. P. Merrill, Galv. M. J., 1867, p. 861.
				1866	.....	.....	.....	.....	Ed. Amer. Prac., vol. 8, 1873, p. 319.
				1873	Sept. 14.	.....	Nov. 9.	1,244	Memphis Board of Health. See G. B. Thornton, in Report of Supervising Surgeon, U. S. Mar. Hos. Service, 1873.
Texas	Alleyton, Colorado Co	On Colorado River	250	1867	Sept. 4.	.....	Dec. —	45	Trans. A. M. A., vol. 19, p. 289.
	Anderson, Grimes Co..	140 miles east by north of Austin, near Brazos River	200	1867	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 275.
	Austin	.....	.....	1867	.....	.....	.....	.....	Galv. M. J., 1867, vol. 2, No. 10, p. 930.
	Bastrop, Bastrop Co	On Colorado River	260	1867	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 275.
	Beaumont, Jefferson Co...	On Neches River	50	1863	.....	.....	.....	.....	Brown, Quarantine, p. 71.
	Belleville, Austin Co	110 miles east southeast of Austin, near Brazos River	180	1855	.....	.....	.....	1	J. Stephens, N. O. M. and S. J., 1856, p. 601.
	Brazoria, Brazoria Co	Near the Gulf of Mexico	20	1859	.....	.....	.....	.....	B. Dowler, N. O. M. J., 1860, p. 443.
	Brenham, Washington Co.	20 miles from Brazos River	300	1867	Aug. 11.	.....	Oct. 31.	120	Trans. A. M. A., vol. 19, p. 275.
	Brownsville, Cameron Co.	On Rio Grande River	25	1353	Sept. 23.	.....	Dec. 23.	50	Army Medical Statistics, p. 353.
				1858	Aug. —	.....	Nov. —	41	S. Chaillé, N. O. M. and S. J., 1858, p. 811.
				1862	.....	.....	.....	.....	Galv. M. J., 1866, p. 170.
	Calvert, Robertson Co	Between the Brazos and Navasota River	325	1867	Oct. 12.	1868	Jan. 10.	250	

Chappell Hill, Washington Co.	Near Brazos River	200	1873	.....	.....	.....	Newspapers.
			1867	Aug. 6.	.....	Dec. —	123	Trans. A. M. A., vol. 19, p. 275.
Columbus, Colorado Co.	On Colorado River	250	1873	.....	.....	.....	.....	Newspapers.
Columbia, Brazoria Co.	On Brazos River	25	1833	.....	.....	.....	132	Galv. M. J., 1866, p. 163.
Corsicana, Navarre Co.	180 miles north northeast of Austin, near the Pecan River	395	1873	.....	.....	.....	.....	Newspapers.
Corpus Christi, Nueces Co.	On Corpus Christi Bay	15	1862	.....	.....	.....	.....	Galv. M. J., 1866, p. 170.
			1867	Aug. —	.....	.....	.....	Brown, Quarantine, p. 70.
			1873	.....	.....	.....	.....	Newspapers.
Cypress City, Harris Co.	Near Cypress Bayou a branch of the San Jacinto River	60	1853	.....	.....	.....	.....	Galv. M. J., 1866, p. 169.
			1859	.....	.....	.....	.....	B. Dowler, N. O. M. J., 1860, p. 443.
Danville, Montgomery Co.	On Branch of the San Jacinto River	160	1867	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 496.
Edinburg, Cameron Co.	On Rio Grande River	100	1859	July —	.....	.....	13	B. Dowler, N. O. M. J., 1860, p. 443.
Goliad, Goliad Co.	On San Antonio River	50	1867	July 12.	.....	.....	23	Trans. A. M. A., vol. 19, p. 284.
Galveston, Galveston Co.	On an island in Galveston Bay	5	1839	Sept. 30.	.....	Oct. 11.	250	Galv. M. J., 1867, p. 856.
			1844	July 5.	.....	.....	400	Galv. M. J., 1867, p. 838.
			1847	Oct. 1.	.....	Nov. 25.	200	Do.
			1853	Aug. 16.	.....	Nov. 28.	536	Ed. Med. and Surg. Rep., vol. 17, 1867, No. 14, p. 297.
			1854	Aug. 9.	.....	Nov. 5.	404	Do.
			1858	Aug. 27.	.....	Nov. 14.	344	Do.
			1859	Sept. 17.	.....	Nov. 30.	182	Do.
			1864	Sept. 1.	.....	Nov. 20.	259	Do.
			1866	.....	.....	.....	.....	Galv. M. J., 1866, p. 338.
			1867	June 26.	.....	Nov. —	1,150	S. M. Welch, Galv. M. J., vol. 1, No. 2, p. 83.
Harrisburg, Harris Co.	On Buffalo Bayou	55	1867	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 289.
Hempstead, Austin Co.	50 miles from Houston, and near Brazos River	200	1867	Aug. 9.	.....	Nov. 26.	151	Trans. A. M. A., vol. 19, p. 275.
Hockley, Harris Co.	Near Buffalo Bayou	50	1853	.....	.....	.....	.....	Galv. M. J., 1866, p. 169.
Houston, Harris Co.	On Buffalo Bayou	50	1839	.....	.....	.....	.....	W. McCraven, N. O. M. N., 1860, p. 105.
			1844	.....	.....	.....	.....	Do.
			1847	.....	.....	.....	.....	Do.
			1848	.....	.....	.....	.....	Do.
			1853	.....	.....	.....	.....	Do.
			1854	.....	.....	.....	.....	Do.
			1858	.....	.....	.....	.....	Do.
			1859	.....	.....	.....	.....	Do.
			1864	.....	.....	.....	.....	Galv. M. J., 1866, p. 163.
			1870	.....	.....	Oct. —	1	Galv. M. J. 1870, p. 296.
Huntsville, Walker Co.	200 miles east by north of Austin	200	1867	Aug. 9.	.....	Oct. 19.	130	Trans. A. M. A., vol. 19, p. 275.
Independence, Washington Co.	80 miles east of Austin, near Brazos River	250	1867	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 289.
Indianola, Calhoun Co.	On Matagorda Bay	10	1852	Sept. —	.....	.....	.....	Indianola Bulletin, Dec. 16, 1870.
			1853	.....	.....	.....	.....	Brown, Quarantine, p. 68.
			1858	.....	.....	.....	.....	Heard, Rep. Epid. of Texas, p. 15.
			1859	.....	.....	.....	.....	B. Dowler, N. O. M. J., 1860, p. 443.
			1862	.....	.....	.....	.....	Brown, Quarantine, p. 68.
			1867	June 20.	.....	.....	80	Trans. A. M. A., vol. 19, p. 268.
La Grange, Fayette Co.	On Colorado River	450	1867	Aug. —	.....	Nov. —	200	Trans. A. M. A., vol. 19, p. 275.
Liberty, Liberty Co.	On Trinity River	40	1867	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 289.
Liverpool, Brazoria Co.	36 miles west of Galveston, near Chocolate River	25	1853	Aug. —	.....	.....	4	Galv. M. J., 1866, p. 169.
Matagorda, Matagorda Co.	On Matagorda Bay	15	1862	.....	.....	.....	120	Galv. M. J., 1866, p. 170.
			1863	.....	.....	.....	.....	Trans. A. M. A., vol. 19, p. 266.

Table of Localities in the United States where Yellow Fever has appeared since A. D. 1668, etc.—Continued.

State.	Locality.	Situation.	Elevation, in feet, above sea-level.	Date of commencement. Year.	Date of commencement. Month.	Date of suspension. Year.	Date of suspension. Month.	Mortality.	Authority.
Texas	Millican, Brazos Co.	Near Brazos River	300	1864	.....	.....	.....	.....	Galv. M. J., 1866, p. 175.
	Navasota, Grimes Co.	On the Navasota River	200	1867	Oct. 15.	.....	Nov. 12.	4	Trans. A. M. A., vol. 19, p. 275.
	Oldtown, near Indianola	.....	20	1867	Aug. 12.	.....	Dec. —	154	A. R. Kilpatrick, Galv. M. J., 1868, vol. 1, No. 3, p. 182.
	Port Lavacca, Calhoun Co.	On Lavacca Bay	15	1867	Oct. 13.	.....	.....	.....	Trans. A. M. A., vol. 19 p. 268.
	Richmond, Fort Bend Co.	On Brazos River	125	1867	July 3.	.....	Oct. 29.	.....	Trans. A. M. A., vol. 19, p. 283.
				1853	.....	.....	.....	.....	Galv. M. J., 1866, p. 163.
	Rio Grande City, Starr Co.	On Rio Grande River	200	1859	.....	.....	.....	.....	B. Dowler, N. O. M. J., 1860, p. 443.
	Sabine City, Jefferson Co.	On Sabine Lake	10	1867	.....	.....	.....	150	Heard, Epidemic Diseases of Texas.
	Saluria, Calhoun Co.	On Matagorda Island	10	1683	July —	.....	Oct. 1.	14	Galv. M. J., 1866, p. 170.
	Sugarland, Fort Bend Co.	On Brazos River	100	1853	.....	.....	.....	.....	
	Victoria, Victoria Co.	On Guadaloupe River	50	1859	.....	.....	.....	.....	B. Dowler, N. O. M. J., 1860, p. 443.
Virginia	Alexandria, Alexandria Co	On Potomac River	25	1867	Aug. 1.	.....	Dec. 25.	200	Trans. A. M. A., vol. 19, p. 284.
	City Point, Prince George Co.	On James River	15	1803	Aug. 1.	.....	.....	200	Dr. Dick, Med. Repos., 1804, p. 190.
	Gosport, Norfolk Co	On Elizabeth River	20	1798	.....	.....	.....	.....	Currie, Memoirs of Yellow Fever, p. 109.
	Hampton Roads	Harbor	.....	1855	.....	.....	.....	.....	J. A. Manning, Va. M. J., 1857, p. 288.
	Norfolk, Norfolk Co.	On Elizabeth River	20	1869	.....	.....	.....	.....	Brown, Quarantine, p. 18.
				1747	.....	.....	.....	.....	Daily Shreveport Times, vol. 2. No. 311, 1873.
				1794	.....	.....	.....	.....	J. H. Griscom, N. Y. J. M., 1856, p. 369.
				1795	.....	.....	.....	.....	Do.
				1796	.....	.....	.....	.....	Va. M. J., 1857, p. 95.
				1797	.....	.....	.....	.....	J. H. Griscom, N. Y. J. M., 1866, p. 369.
				1798	.....	.....	.....	.....	Va. M. J., 1857, p. 95.
				1799	.....	.....	.....	.....	Do.
				1800	July 26.	.....	Oct. 30	250	Med. Repos., vol. 4, p. 329.
				1801	.....	.....	.....	.....	Va. M. J., 1857, p. 95.
				1802	.....	.....	.....	.....	Do.
				1803	.....	.....	.....	.....	Do.
				1804	.....	.....	.....	.....	Do.
				1805	.....	.....	.....	.....	Do.
				1821	Aug. 1.	.....	.....	.....	Va. M. J., 1857, p. 95.
				1826	Sept. 1.	.....	.....	.....	Committee's Report, p. 14.
				1852	Aug. 7.	.....	.....	.....	Va. M. J., 1857, p. 95.
				1854	Oct. —	.....	Nov. 2.	3	Do.
				18[illegible]5	June 30.	.....	Oct. —	1,807	Portsmouth Relief Association Report.
	Petersburg, Dinwiddie Co.	On Appomattox River	20	1798	.....	.....	.....	.....	Currie, Memoirs Yellow Fever, p. 109.
	Portsmouth, Norfolk Co.	On Elizabeth River	20	1852	.....	.....	.....	.....	Portsmouth Relief Association Report, p. 91.
				1854	.....	.....	.....	.....	Do.
				1855	Aug. 1.	.....	Oct. —	1,000	Portsmouth Relief Association Report, p. 77.
	Richmond, Henrico Co.	On James River	50	1806	.....	.....	.....	.....	M. Repos., 1807, p. 215.
	Scott's Creek, near Portsmouth	.....	15	1855	June 29.	.....	June 29.	.....	J. A. Manning, Va. M. J., 1857, p. 29.
	Winchester Frederick Co.	20 miles from the Blue Ridge Mountains	700	1804	July —	.....	July —	.....	R. Dunbar, Med. Repos., 1805, p. 252.

PLACES.	POPULATION.	NUMBER OF CASES.	MORTALITY.	PROPORTION TO POPULATION.	PROPORTION TO CASES.	AUTHORITIES.
West Indies generally					1 in 1.5 to 1 in 1.33	Rochoux (1828), p. 568.
" "					1 in 3, often 1 in 2	Robert Jackson, Sketch, p. 13.
Windward and Leeward Islands				1 in 2		Proudfoot, Edinb. Journ., pp. 28, 295.
" " Sir Ch. Grey's Army, 1794.	12,000 (estimated)		6,012	1 in 2	1 in 2.34	Statist. Rept. of British Army, p. 50.
St. Domingo 1734				1 in 2	1 in 1.5	Chisholm, i, 451.
" 1802	40,000 (soldiers)	27,100 (estimated)	20,000	1 in 2	1 in 1.33—1 in 1.2	
" 1798	25,000 (soldiers)			1 in 1.14		Desportes, i, 55; Gilbert, p. 70.
" Port Mirbalais	300		290	1 in 1.04		Bally, pp. 80, 286; Caillot, p. 160.
" St. Nicholas, 1796					1 in 2	H. McLean, R. Jackson's Outline, pp. 61-2-4.
" Port au Prince (Rohan Hussars)					1 in 2	R. Jackson on Cold Affusions, pp. 230-31.
" St. Mark	500 (troops)	200	100	1 in 5	1 in 2	
Demerara, Georgetown Hospital		Severe..2071 / Mild ..... 961 } 3032	404		Severe, 1 in 4.54 / All, ...1 in 7.5.	Blair, p. 49.
Martinique,[1] 1823-7 (Hospital)					1 in 2.5, 1 in 3 / 1 in 3.5, 1 in 1.5	
" 1838-9		1,344	223		1 in 6	
" first 3 mos. of 1839		92	19		1 in 4.5	
" Oct. 1, 1838, to Sept. 30, 1839		1,202	150		1 in 8	Catel, pp. 14, 20, 21; Rufz, p. 10.
" 1818		1,982	697		1 in 2.82	Lefort Du Quinquina, et de la Saignée, p. 586.
" 1825		1,464	388		1 in 3.8	
" 1821		686	235		1 in 3	Kéraudren, pp. 14, 15.
" 1802-7 (soldiers)	11,085	8,673 (estimated)	2,891	1 in 3.8	1 in 3	Moreau de Jonnès, p. 349.
" By Dariste, from Aug. 1816, to close of 1817		327	61		1 in 5.36	Dariste, p. 24.
" last 6 mos. of 1803, and first 6 mos. of 1804		2,462	546		1 in 4.5	Edinb. Journ., lxxix, 236.
" 1852, Port Royal	12,611		727	1 in 17.34		
" St. Pierre	20,360		1,200	1 in 17		
Guadaloupe,[2] Point à Pitre		475	152		1 in 3.1	
" 1803	3,500 (troops)		2,700	1 in 1.3		
"	3,700		2,900		1 in 1.21	Kéraudren, pp. 14, 15; Bally, pp. 81, 287.
" 1826		386	128		1 in 3	Caillot, p. 170; Vatable, p. 347
" 1843, (sailors and troops)	2,757	772	183	1 in 15.06	1 in 4.22	Chisholm, pref. 2d ed., p. xvii.
" Basseterre		96	64		1 in 15	Chisholm, i, 451; ii, 119.
" " 1833 (soldiers)		137	47			Arnoux, An. Marit., 1844, ii, 758.
" 1796-9	20,000		13,807	1 in 1.47		Cornuel, An. Marit., 1844, ii, 735.
" 1796	367 (artillery)		129	1 in 2.8		Moreau de Jonnès, p. 349.
" 1802-7, inclusive	16,363		5,057	1 in 3.2		

[1] In 1802 the mortality among troops amounted to 60 per cent.
1803 " " " 44 "
1804 " " " 30 "
1805 " " " 40 "
Moreau de Jonnès.

[2] In 1803 ..... 46 per cent.
1804 ..... 29 "
1805 ..... 49 "
Moreau de Jonnès.

Yellow Fever in Tropical Climates.—Continued.

PLACES.	POPULATION.	NUMBER OF CASES.	MORTALITY.	PROPORTION TO POPULATION.	PROPORTION TO CASES.	AUTHORITIES.
St. Lucia, 1664–6	1,500 (soldiers)		1,411	1 in 1.06		Father Du Tertre, iii, 86, 244.
"	500 (sailors)		200	1 in 2.5		Chisholm, i, 124.
"	5,000		Nearly all in 1 year.			Dr. John Hunter, p. 47.
Grenada, 1793 (sailors)					1 in 3	
" sailors, soldiers, and white inhabitants					1 in 7	Chisholm, i, 144.
" white inhabitants					1 in 5	Laing, in Trotter, ii, 81.
"	1,130 (soldiers)		630	1 in 1.8		
Jamaica, 1815					1 in 4	
" 1819, '21, '27					1 in 2, 1 in 4, 1 in 1.08	Statistical Reports, pp. 46, 94.
" 1819, '22, 25, 27					1 in 2	Arnold, pp. 148, 149, 165, 171, 247.
" 1819	2 regiments				1 in 2, 1 in 1.7	
" Stony Hill, 1827	300		184	1 in 1.6		
San Juan	1,800		1,420	1 in 1.3		Moseley, p. 163.
St. Christopher, 1812		422	118		1 in 3.58	Proudfoot, Edinb. Journ., xxviii, 295.
Bermuda, 1819		208	32		1 in 13	Jones, Lond. Med. Repos., March, 1823.
Barbadoes, 1816		390 men, 25 officers	90		1 in 4.33	
" 1820			10		1 in 2.5	
" 1838					1 in 2.56	Proudfoot, Edinb. Journ., xxviii, 295.
" 1841					1 in 4.25	Ralph, Edinb. Med.-Chir. Trans., ii, 61.
" 1842					1 in 1.2	J. Davy, Notes on Blair, 49.
" 1852 (troops)	1,380	879	173	1 in 7.9	1 in 5.6, 1 in 5.08	Finlay, p. 25.
Havana, 1837					1 in 10	
" Belot's Hospital					1 in 6.48	Maher, Ann. Maritime, p. 878.
" 1794				1 in 1.1 in someships	1 in 1.1	Holliday, pp. 9, 10.
Dominica, 1838	131 (soldiers)	100 men, 6 officers	35 men, 3 offic's.	1 in 3.72	1 in 3 men, 1 in 2 officers	Imray, Edinb. Med. Journ., liii, 95.
" 1841		204	58		1 in 3.7	Ibid., lxiv, 328.
Trinidad, 1818					1 in 2.64	Tullock's Reports, p. 19.
Vera Cruz, 1803 (hospital)	16,000 to 17,000	428	69	1 in 2.40	1 in 6.2	Humboldt's New Spain, p. 777.
" in 15 years					1 in 2.8 to 1 in 6.23	Ibid., p. 779.
Porto Cabello					1 in 1.54	Humboldt's Personal Narrative, iii.
Boa Vista, 1845, Porto Sal Rey	Portuguese 53	47	25	1 in 2.1	1 in 1.8	
" " "	Eng. and Am. 11	8	7	1 in 1.6	1 in 1.1	
" " "	Natives 915		68		1 in 13.4	McWilliams' Report, pp. 87, 88, 91.
" in all localities	Europeans 69		32		1 in 1.16	Med.-Chir. Rev. for July, 1847, pp. 233–4.
" " "	Natives 4,309		279		1 in 15.4	
Georgetown (Demerara) Seamen's Hospital, in 1838, etc.		2,071	404		1 in 5.12	Blair, p. 49.
Cayenne, 1850 (Hospital)		685	148		1 in 4.63	Report of Drs. Ginoaves, Reboue, etc., Ann. Marit., 1852, viii, 179.
On board the Childers		All but 3 of crew			1 in 2	Birnie, Edinb. Journ., xiii, 334.
Antelope		110	31		1 in 4	Ibid.

Rattlesnake		28	12		1 in 2.3	J. Wilson, p. 4.
Pyramus		102	30		1 in 3.4	Musgrave, Med.-Chir. Rev. and J., iv, 1001.
Macedonia	376		101	1 in 3.7		Minutes of Proceed. of Court of Inq., p. 39.
Hornet, Grampus, and Peacock		129	21		1 in 6.14	Barrington, Am. Journ., xii, 313, 317.
Capt. Owen's Surveying vessel, coast of Africa				1 in 1.5 of crew, 1 in 2 of officers.		Wallace, Edinb. Journ., lvi, 287.
Bann		99	34		1 in 3	Bryson, p. 37.
Ascension		28	15		1 in 2	Ibid.
Eden					1 in 1.5	Ibid., p. 64.
Ætna		99	25		1 in 4	Ibid., p. 120.
Water Witch		60	15		1 in 4	Ibid., p. 128.
Dasher		15	4		1 in 3.75	Musgrave, Med.-Chir. Rev. and J., vi, 994.
French war steamer Gomer, 1843		165	17		1 in 9.7	Joubert, Ann., Marit., 1844, ii, 978-9.
Ship Delaware, 1799		40	20		1 in 2	Kollock, Med. Rep., iv, 4.
Sybille		87	26			Bryson.
Dauntless	327	178	85	1 in 3.85	1 in 2	Finlay, p. 25.
Steamers from St. Thomas to Southampton, Nov. 1852		124	50		1 in 2.3	Lancet, April, 1853.

MORTALITY IN WEST INDIES AMONG FRENCH TROOPS.

1802	57 per cent.	1805	40.4 per cent.
1803	35.7 "	1806	9 "
1804	29.3 "	1807	12.8 "

Marshall, *Sketch of the Geogr. Distribution of Diseases, Edinb. Med. and Surg. Journ.*, xxxviii, 345.

YELLOW FEVER IN EUROPE.

PLACES.	POPULATION.	NUMBER OF CASES.	MORTALITY.	PROPORTION TO POPULATION.	PROPORTION TO CASES.	AUTHORITIES.
Cadiz, 1800	71,491, 57,499 remained	48,520	7,387[1]	to entire 1 in 9.56; to rem'g 1 in 7.67	1 in 6.42	Arejula, p. 434; Berthe, pp. 358, 372, Caisergues, p. 214; Fellowes, p. 420.
" Hospital					1 in 2	Bally, pp. 72, 288; Dumeril in Humboldt, p. 779.
" 1804		5,000	2,000[2] 2,800[3]		1 in 2, about	Doughty, pp. 191, 2; Pariset, p. 63.
" 1813	130,000		4,000[4]	1 in 32.5		Alf. de Maria, p. 122.
" 1819	72,000	48,000	5,000	1 in 14.4	1 in 9.6	
Seville, 1800. (Note 1.)	80,568	76,488	14,685[5]	1 in 5.5	1 in 5.21	Arejula, p. 434; Caisergues, pp. 190, 214.
" General Hospital		2,365	1,556		1 in 1.45	Alf. de Maria, pp. 122-3.
" Santa Caridad		81	44		1 in 2	Berthe, pp. 163, 358; Bally, pp. 74, 77.
" 1801		1,100	660		1 in 1.75	Fellowes, p. 421; Dumeril, loc. cit., p. 779.
" 1819		346	217		1 in 1.6	Pariset, pp. 13, 65.
Xeres, 1800	33,000 {Bally 42,000}	30,000	12 to 13,000[6]	1 in 2.54	1 in 2.5, or 1 in 3	Caisergues, p. 214; Dumeril in Humboldt, p. 779.
" 1819	45,000	1,262	408	1 in 110.3	1 in 3.09	Proudfoot, Edinb. Journ., xxviii, 295.
" 1820. (Note 2.)					1 in 2	Bally, p. 75; Berthe, p. 358.
" Siguenza Hospital		201	112		1 in 1.8	Pariset. Obs., p. 65.
Carlotta	Entire 733, Remaining 473	195	122	1 in 6 of entire, 1 in 3.8 of rem'g.	1 in 1.6	Jackson, Fever of Spain, p. 137. O'Halloran, p. 137.
Puerto Santa Maria, 1800	20,000		400[7]	1 in 50		Bally, pp. 74-5.
San Lucar, 1800	18,000		3,000[8]	1 in 6		
Ecija, 1800	40,000	400	100	1 in 40	1 in 4	Bally, p. 75.
" 1804			3,802	1 in 10		Fellowes, p. 478.
Carthagena, 1804	33,222		11,445			Fellowes, pp. 478-9; Arejula, Map.
Malaga, 1803	51,745, remaining 48,015	16,517	6,884	1 in 4.1 of remaining population,	1 in 2.4	Arejula, p. 441 and Map; Humboldt, p. 779.
" in a Swiss regiment	977	418	155	1 in 6.2	1 in 2.6	Alf. de Maria, pp. 122-3.
" 1804	36,054 remaining		11,464		1 in 1.67	Cyclop Pract. Med., ii, 278; Fellowes, p 478.
" 1821		21	17		1 in 1.3	Bally, pp. 90, 288, 89, 90; O'Halloran, p. 132.
Alicant, 1804	13,000	9,000	2,471	1 in 5.3	1 in 3.64	Bally, p. 90.
Tortosa, 1821	15,000, remaining 5,000		2,356	1 in 6.4 of entire, 1 in 2.1 of rem'g.		Pariset, pp. 55, 435. Chervin, Examen., p. 202.
Porto Reale	20,000	5,500	688	1 in 29.07	1 in 9	Pariset, Obs., p. 64.
Gibraltar, 1804. (Note 3)	10,000 estimated		5,946	1 in 2		
" Hospital		2,754	894		1 in 3.1	Med. Statist. of British Army, p. 8.
" 1813	20,501, remaining 12,501	2,847[9]	904	1 in 22.67 of entire, 1 in 13.83 of rem'g.	1 in 3.4	Gilpin, Med.-Chir. Trans., v, 337. Edinb. Journ., x, 317.
" Hospital, 1814		726	114[10]		1 in 6.36	Fellowes, pp. 76, 449, 50, 1-3.
" civilians			132			Pym, p. 26, 2d ed.; pp. 47, 250 1st ed.
" 1828	20,652	6,715	1,796	1 in 11 5	1 in 3.73	Hennen's Med. Topog. of Medit., pp. 98, 113.
" troops	3,652	2,014	515	1 in 8.41	1 in 3.91	Proudfoot, Edinb. Med. Journ., xxviii, 285.
" civilians	17,000	4,701	1,281	1 in 13.3	1 in 3.6	Louis, p. 259; Smith, Edinb. Journ., xxxv, 41.

Barcelona, 1803		73	30		1 in 2,43	
" 1821	145,000, remaining 70,000	14,000	9,730	1 in 15, or 1 in 7	1 in 1.33	Pariset, p. 462, on authority of Dr. Steva.
" Seminary Hospital		1,739	1,265		1 in 1.3	Pariset, pp. 26, 46, 462, 515, 608, 613.
" General Hospital		830	749		1 in 1.1	O'Halloran, pp. 79, 208; Audouard, p. 168.
" Marine Hospital		79	55		1 in 1.44	Chervin, Exam., pp. 170, 176.
" Lazaretto of V. Queen of Peru		56	39		1 in 1.44	Rochoux, pp. 105, 462.
" city and suburb, according to Audouard.		20,625	16 to 17,000	1 in 8.8, 1 in 4.24	1 in 1.25	Rochoux, Archives, xv, 452. McLean, Evils of Quar , p. 134-5.
Palma, 1821	12,000 remaining	7,400	5,341	1 in 1.62	1 in 1.5	Pariset, p. 70.
Port du Passage, 1823	3,000, 1,200 remaining	85	24	1 in 125, or 1 in 50	1 in 3.96	Jourdain, Am. and Med. Phys., iv, 505.
		101 (Audouard)	40 (Audouard)	1 in 75, or 1 in 30	1 in 2.5	Audouard, Hist. de la fièvre jaune qua a régnée au Port du Passage, p. 35.
Leghorn, 1804	60,000, 48,000 remaining in city.		655			Dufour, Obs. de Marseilles, iii, 286. Palloni, Obs. Sulla Malatia, etc., tables.
" Hospital		164	56		1 in 3	Tommasini, i, 44.

[1] According to Alfonzo de Maria, the mortality was 10,186, p. 122.
[2] According to Dumeril.
[3] According to Bally. According to Alf. de Maria, 3,200, p. 122.
[4] Alf. de Maria, 2,239.
[5] Dumeril says 20,000.
[6] Bally says 14,000. Alf. de Maria, 10,192.
[7] Alf. de Maria, 6,393, p. 122.
[8] Ibid., 2,303, p. 122.
[9] From 8th September to 3d December.
[10] 1,400, according to Hennen, p. 113.

NOTES.

NOTE 1.—Seville, 1800. When we read the statement here recorded of the diffusion and ratio of mortality of the disease on that occasion, authentic as it appears to be, we can with difficulty divest ourselves of the idea of error having crept in somewhere. Not that I feel disposed to swell the mortality to 20,000, as was done by Dumeril (Humboldt, 779), and thereby diminish the ratio of recoveries; but I am inclined to regard it as probable that the number of those stricken down with the real malignant yellow fever did not reach the amount mentioned. The idea of an epidemic extending its baneful influence to all but 4,000 in a population of 80,000, is difficult to reconcile with the facts known respecting the diffusion of the same disease elsewhere. More natural is it to presume that in the number of cases recorded are included many of other and milder complaints. Should this be true, the proportion of deaths to recoveries would be larger than stated; while the number of cases might still be very large in proportion to the population. To this opinion I am the more inclined, because, so far as we can ascertain, the Spanish physicians, of those times at least, were not noted for accuracy in matters of diagnosis, and their success in the treatment of the disease has not usually been such as to induce the belief that they would lose but 1 in 5.21 during a wide-spreading and highly malignant epidemic. The same remarks are equally applicable to the reported occurrences in Cadiz and other cities of Spain.

NOTE 2.—"The mortality from the yellow fever has been prodigiously great in most of the seasons in which it has appeared in Andalusia; but the precise proportion of deaths to recoveries is not correctly known, as the official reports are not made up with exactness. It amounted to 70 in 100 at Xeres de la Frontera, according to the official return It was in reality much higher, for those only were included in the dead list who were buried without the town. Private burial was obtained for many, and such were not registered, at least not correctly. Many, even a great many, were entered on the yellow fever list by connivance—that is, for the sake of the allowance granted by the municipality for that description of sick only. The diseases of those so entered were, it may be presumed, of a less mortal character than the yellow fever; consequently the real truth is disguised in such a manner that the public is deceived, and the medical faculty can form no accurate conclusion. It may be said, with safety, that the mortality was not in reality less than one-half of those who were attacked."—*R. Jackson, M. D., Remarks on Ep. Yel. Fev. of the Coast of Spain*, pp. 137-8.

NOTE 3.—Dr. (now Sir) Joseph D. Gilpin reports the deaths from the 30th of September to the 1st of December, soldiers and civilians, at 6,524. He does this on the authority of a very respectable inhabitant of the place. But as he was not in the garrison at that period, he cannot vouch for the accuracy of the report. This latter includes 730 deaths among the Jews, which are not mentioned in the official report published in Sir James Fellowes' and Sir W. Pym's works, which I have used.[1]

The number of cases is not stated. Dr. Proudfoot says that the mortality was more than 1 in 3, and that only 28 persons escaped an attack out of 9,000 inhabitants. If such was the fact, the mortality was 1 in 1.5, as the cases must have amounted to 8,972, which, divided by 5,946—the number of deaths reported—gives the ratio mentioned.[2]

[1] Med.-Chir. Trans., v, 337.

[2] Edinb. Med. and Surg. Journ., xxviii, 295.

FEBRIS EXANTHEMA ARTHRISIS (DENGUE).

The Latin name above I gave to Dengue, in 1863, when I had it in the army, at Galveston. It was epidemic in that city, and about as many soldiers had it in 1863 as had yellow fever in 1864. The Latin name expresses the two most prominent symptoms, one or the other occurring in almost every case, and in some epidemics both were constant.

The fever is higher, by at least two degrees, than yellow fever, and lasts at least twenty-four to forty-eight hours longer, commencing with a remission on the third day to the fifth or sixth day. An eruption, an exanthem, appears on or about the third day, and after the eruption comes out the temperature falls, as well as the pulse; when it begins to recede the temperature as well as pulse become natural. The arthresia is not always severe, but at other times it is as bad as rheumatism, and has been called by some rheumatic arthrisis, but the pain in the joints and limbs is not to be called an inflammation, but neuralgia. It is also attended with a disposition to perspire, but when the eruption appears this seems to be suppressed, and every effort to force perspiration makes the patient suffer more; many suffer from soreness of the throat, but no swelling as seen in scarlet fever. The eruption is between a case of measles and that of scarlet fever—not so bright as scarlet fever, but eruption much more distinct and brighter, and more regular, than measles, affecting even the palms of the hands, and soles of the feet. My own case was marked by all these peculiarities of eruption, but I did not suffer much pain, as I treated myself with citrate of magnesia solution, lemonade and morphine. This was my usual treatment of the epidemics of 1863, and cases in 1865 at hospital, but in the epidemic of 1873 I found more active treatment necessary, as given in the Bourquin family, as will be seen. I was apprehensive Mr. Bourquin would have convulsions, and to avoid it I gave him aconite and veratrum. How it got to Galveston, where it came from, or who had it first, no one seemed to know, and as no one died nobody seemed to care. It never produces death in and of itself; yet, as we have seen, it is so much like a mild case of yellow fever, that I believe it is impossible to tell them apart; but the least imprudence will change the yellow fever into a fatal attack, and the other will run into stiffening of the joints; if one takes cold or gets wet it is likely to produce sore throat. I was exposed to a shower of rain and suffered from a long and protracted attack of typhoid fever, that came very near taking my life. I am indebted to Captain and Mrs. Lufkin for their care and kindness; the captain took me to his house from the hospital, and kept me until I finally recovered. I continued quite strong, until yellow fever took me next year, as we have seen, from a similar exposure to rain. After having yellow fever I took jaundice. I mention these facts to show that in all fermentative diseases exposures are very bad, and especially so in the eruptive varieties—measles, scarlet fever, dengue, and more particularly than all, yellow

fever. I have never seen any of those limping, irregular-gait cases spoken of, in any epidemic, and from the reports of others, I do not believe it has been noticed in our State. In the great epidemic at Galveston, in 1873, the eruptions were not so common as in 1863, and the other years I have seen it. It has often occurred in the same years as yellow fever, as we have seen, but when it is epidemic we rarely have any cases of yellow fever, only a few sporadic cases; and now our people rejoice when dengue breaks out, and seem assured we will not have an epidemic of yellow fever. This seems to have been the case in New Orleans in 1873, when there were estimated to be 50,000 cases of dengue, and only 225 deaths from yellow fever. Such was the case in Galveston—3000 cases of dengue and no deaths; of yellow fever only about 24 cases with seven deaths. I did not say, as Drs. Palmer and Harrison accused me of saying, that we had dengue at Calvert, but stated what I have often said, that there were cases of yellow fever at Calvert that I could not tell from dengue by the tongue or fever; but if imprudent in the least, these apparent dengue cases would turn yellow and suffer from hemorrhages, which I never saw in any case of dengue. The only hemorrhage proper to dengue is from the womb, and that is as common, and even more so, than in yellow fever or small-pox, because the patient is more plethoric and not much reduced by dengue. Dengue does not protect from yellow fever, nor yellow fever from dengue. They are as separate and distinct as measles and scarlet fever. Hence Drs. Arnold, of Savannah, Georgia, and Faget, of New Orleans, are wrong when they think these affections are different types of the same disease. I believe yellow fever will override dengue and set up on it a new fermentative process, as it does in many, very many, cases in intermittents and remittents, and syphilis, and, according to Dr. McCraven, almost everything. Dengue has no connection whatever with intermittents, and none of its symptoms are present in cities where intermittents are not found. Physicians soon distinguish this from malarial continued fever by the skin and tongue, and general healthy appearance of the patient, as compared with these diseases. The red edged tongue and brown fur which is common with it and yellow fever on second and third days, disappear as soon as the fever leaves.

TREATMENT OF DENGUE.

To open the bowels with citrate of magnesia solution, and keep them open, is all that is absolutely necessary, but morphine and lemonade are very grateful to the patient, and will prevent the neuralgic pains. Where complicated with malaria, I have not found anything better than the three and three powders, with quinine, if fever return, and if very debilitated and pulse sinks very low, I give the tonic mixture—

℞. Tinct. cinchonæ,
Tinct. gentianæ,
Tinct. colombonis, āā. ℥ij.

Sig.—Tablespoonful every two hours, in a little water, until four doses are taken, every morning.

I have never seen any blood in the urine of dengue, or any change like the urine of jaundice; and no one has ever suffered from suppression; but the opiates sometimes cause retention—difficulty in urinating when the bladder is full, hence, large doses should not be given, but small sudorific doses.

Early in June, 1873, dengue fever became common in Galveston, and continued

through the entire summer. From whence it came, or whither it went none of us knew. Its cause was no less a mystery. Its symptoms were varied. I give below selections of three cases, with treatment, treated my me, in the same house.

Mr. Bourquin had been sick for several months with bilious attacks when I saw him; his tongue was brown, edges red, as if he had had typhoid fever for ten days; he was sitting up with dyspnœa; could not lie down; sweating profusely over the entire body; pulse very feeble; skin hot. While with him he was very near fainting or going into convulsions. I gave him calomel, quinine and Dover's powders, in four-grain doses, every three hours, in a little water, until three doses were taken each day. This treatment was continued for three successive days. He recovered without ptyalism, but his fever did not break or remit for three entire days and nights.

Mrs. Bourquin was next taken; was treated with three grain-doses of calomel, quinine and Dover's powders, every three hours, until three doses had been taken each day; recovered.

Miss Bourquin was taken with it on the seventh of August; throat very sore; tonsils enlarged; tongue covered with brown fur on the sides, with red streaks down the centre, and red edges; skin hot; pulse 100; ordered two grains of calomel; quinine and Dover's powders every three hours, until six grains of each were taken each day; fever lasted three days; recovered, but sore throat continued for a week. All these patients took from five to fifteen drops tincture aconite every three, four or five hours, as long as fever continued; lemonade and ice when they wanted it; citrate of magnesia solution when the bowels did not act. I treated all my cases upon this plan. Many children had spasms; one treated last Friday, Saturday and Sunday had spasms; one treated Saturday, Sunday and Monday, 28th of November, in whom the symptoms were like those in Miss Bourquin's case; tongue heavily coated; tonsils enlarged, with eruptions of a papulous character on tongue and lips. To these I gave gargles composed of equal quantities of compound tincture of capsicum, tincture of guaiac or myrrh; teaspoonful in a teacup of water, as a gargle, every three or four hours. I did not lose a single case, but I know of two deaths where there were complications; one died of congestion of the lungs. There were not less than three thousand cases in Galveston from June to the present time, and our mortality was less than usual for the same months. I hardly believe there occurred a single death from dengue alone, and with complications could not hear of more than ten or twelve deaths out of three thousand or more cases. Some cases had a rash almost equal to scarlet fever. Relapses were common, and when not promptly treated, the skin became hot and dry and the tongue continued of a typhoid type; pulse slow, with irregular remissions; some were from fifteen to twenty days recovering, but most cases recovered in from three to ten days. All looked broken and feeble, and many suffered pain in back, head, limbs, and especially in the hips. Nearly all women who had it had a hemorrhagic flow, even those who had ceased to menstruate for several years. I generally gave the following as a tonic, which was well received and did much good, as nearly every one eulogized it. Equal parts of tincture of cinchona, gentian and columbo; a tablespoonful every two hours in a little water, until four doses were taken each day, beginning before breakfast. In some the cuticle peeled off of the entire body, while in many others only from the hands and feet. I had it in 1863, in the army at Galveston, but did not have it this year. Many had it, who reported themselves to have had it before. I did not see any one with it that I had treated for dengue in the epidemic of 1863, and in proportion to

the population I think it was as common and general that year as this. I saw no limping or paralytic cases; all walked straight and well, but feeble. No cases suffered from uræmia that I treated, nor did I hear of any difficulty in that way. The urine was generally nearly natural; no blood in it. A few suffered from epistaxis and hæmoptysis.

As a further illustration of the peculiarities in these diseases, we here reprint Dr. H. C. D'Aquin's report, from the *New Orleans Journal*, January, 1874, which we consider the most scientific article we have seen, on these special diseases; it corresponds exactly with my experience, hence I adopt it as a whole, as I cannot make any improvement on it.

DENGUE A TYPICAL ERUPTIVE FEVER: ITS THERMOMETRICAL SEMEÏOLOGY.

The thermometrical charts of a few observations of Dengue, taken during the epidemic of 1873, demonstrate that it is a typical fever; and the accompanying eruption places it among the eruptive fevers. Its thermometrical scale has the greatest analogy with that of varioloid, whilst its eruption ranges nearer to that of measles, or scarlet fever.

The charts have been made with observations belonging to civil practice; but the temperatures were taken with the greatest care, twice, and sometimes three times a day, at about the same hours. The dotted lines, that are continuous with those of the temperature, represent missing visits, figured through strict information taken at the bed of the patient. The other dotted parallel lines figure the number of pulsations corresponding with each temperature. All the patients were acclimated, with the exception of No. 5, coming from Galveston, the day previous to the invasion of his case; No. 12, born in northern Louisiana; Nos. 4 and 14, who left Shreveport seven days before being taken sick, and No. 8, a stranger, living in the city for a year, but not yet acclimated.

Dengue, as a type, is a fever with two paroxysms, separated by a short remission, and lasting five full days.

The first paroxysm, *period of invasion*, sets in abruptly with a high temperature, the exact degree of which could not be ascertained, on account of the difficulty of seeing the patient at the very moment of the invasion. The *defervescence* that terminates this period, is either slow or rapid, and ends in a period of calm, or *remission* of short duration, which is immediately followed by a quick or a lingering rise, *effervescence*, terminating by a high temperature, the acme of the second paroxysm or *exacerbation*. The second defervescence, which is generally lytic, without or with very small evening rises, comes after, and terminates the disease by a fall to the normal point, in the early part of the morning that follows five complete twenty-four hours, which is generally the morning of the sixth day, or the seventh when invasion took place after mid-day on the first day.

An eruption which could not be detected in all the cases, mixed as it were with Lichen Agrius and other eruptions, the product of excessive summer heat, appears at the very fastigium of the invasion, follows it through all its periods, becoming paler during first defervescence and remission, stronger marked during effervescence and fastigium of exacerbation, disappearing and desquamation taking place during and after second defervescence.

Observation No. 7, though not complete, was a good illustration of the course of temperature, together with that of the eruption, which was scarlet-like and confluent.

The paroxysms and eruptions of dengue have been described by authors in former epidemics, without the use of the thermometer; the charts only confirm their observation (see Jules Rochard, Article "Dengue," Dictionnaire de Medicine et de Chirurgie pratique).

Observation No. 20, which is that of a very mild though confluent case of varioloid, shows how much dengue resembles an eruptive fever by the course of temperature and eruption. At the highest fastigium of the period of invasion, appear the first papules; then begins a first defervescence, which terminates by a remission, when the eruption is complete and vascular; then comes the effervescence of secondary fever, whilst the variolic exudation is transforming into pus, and when all the pustules are mature, it stops, and second defervescence begins, ending at a normal temperature when dessication is nearly completed, after twelve days evolution. Change the form of the eruption, and take half the time of the evolution of the disease, and no two typical fevers will resemble each other more.

If we examine with care the thermometrical charts of dengue, especially the cases observed on the first day, or the beginning of the second, we remark:—

1st. That the remission between the two high temperatures rarely comes to the normal point; but stops at a few tenths of a degree above or below 38° Cent., 100.4° Fahr., not being a period of apyrexia, but a diminution of heat of short duration.

2d. That the remission does not always fall on the same days, but sometimes on the third or on the fourth day.

3d. That the exacerbation shows a high peak also on different days, on the third, the fourth, and even the fifth.

4th. That notwithstanding this fall of remission and exacerbation on different days, the disease completes its evolution in five times twenty-four hours, in nearly all the cases; the time of the excursus of the effervescence and defervescence constituting the paroxysms, being longer or shorter, in order to compensate the time of the complete evolution of the disease.

5th. That each of the paroxysms lasts separately from forty-eight hours to three days and a half; but that the time of their evolution is not generally the same.

6th. That the pulse follows faithfully the rise and fall of the temperature, throughout all the periods, the two lines being parallel mostly all the time.

These minute remarks confirm the disease in its type, and establish the thermometrical diagnosis between dengue and other typical fevers resembling it, such as yellow fever and malaria.

The period of invasion of yellow fever resembles that of dengue to such an extent, that the two have been confounded; nay, some physicians have considered dengue as a miniature yellow fever. The two charts of yellow fever, No. 18, from Dr. Layton, and No. 19, from Dr. Touatre, give us the following difference between the two diseases. There is but one paroxysm in yellow fever, as Dr. Faget has judiciously observed, that of invasion; it lasts from two to three days or more, showing one higher peak on one of those days. The defervescence that follows is sometimes quick, sometimes slow; but there is no remission followed by an exacerbation. If by chance it happens that there is a second rise of temperature, it comes at no specified time, and is a sign of the congestional state of some organs, and not the consequence of a regular febrile process. What is more remarkable, and belongs especially to yellow fever, as a type, is the absence of parallelism between the number of pulsations and the degree of heat. In the first days always, and generally throughout all the disease (this is again an observation due to Dr. Faget), the pulse de-

creases regularly morning and evening, whilst (as Dr. Touatre has shown in his charts) the temperature rises and descends, regardless of the line of the pulse. This absence of parallelism, between pulse and temperature, that of an exacerbation at a determined period, and of a regular evolution, during a certain number of days, give us the difference between the two types.

In dengue, the sudden invasion of the first paroxysm, culminating rapidly to an hyperpyretic temperature, produces a chilly sensation in the same way that chill happens whenever fever comes to extreme heat in the course of a few hours. The slow defervescence that follows the remission, and effervescence that precedes the exacerbation, constitute altogether a period of calm and relief for the patient, who realizes two paroxysms, separated by a period of diminished pyrexia. The physician who was not present at the invasion, and did not follow the course of the disease with the thermometer, would be apt, on this information, to diagnose an intermittent malaria. But compare the charts Nos. 21, 22 and 23, copied from Wunderlich. There, each paroxysm lasts from six to twenty-four hours, the effervescence and defervescence are each equal and critical, that is, fall in one nearly perpendicular line. Each paroxysm is separated by a period of real apyrexia, varying from twelve hours to three days or more, according to the types; there is an unlimited number of paroxysms. With dengue, the paroxysms last a longer time, from forty-eight hours to three days; their effervescence and defervescence are sometimes lytic, sometimes critical; the number of paroxysms is unlimited; they are not equal one to the other; there is no period of real apyrexia, only a calm and remission, and though the disease evolutes in five days, its periods do not show the same regularity as those of malaria.

The authors have described a second exacerbation of dengue. In some cases, it seems as if there was really a third paroxysm. Observation No. 13, which was a severe case, and terminated thirty-six hours later than the regular cases, shows that it was due to the defervescence of exacerbation, which, instead of being lytic or critical, with small evening rises, was intermittent, with a great difference between the morning and evening temperatures.

The exacerbation seems to have missed sometimes. We see upon examination of observation No. 12, that this absence of second paroxysm must have been only apparent in many cases, where observations with the thermometer were not taken. After the invasion, the temperature was never febrile, but remained sub-febrile, during the five full days. We find a remission on the fourth day, an exacerbation on the sixth, and a fall below normal early on the morning of the seventh day. The invasion having taken place at twelve o'clock on the first day, we count five full days, and a fall below normal on the following morning for the complete evolution of this case, whose chart of temperature represents in miniature the same figure as that of other cases of dengue.

Observation No. 14 would simulate at first sight an intermittent fever; for the defervescence of first paroxysm is rapid and reaches the normal temperature, and the excursus of effervescence and defervescence of exacerbation are equal to each other, and composed of three observations each. But remark that the remission is so short, that in a few hours temperature rises to 100° Fahr., 37.8° Cent., the effervesence takes thirty-six hours to rise to the acme of exacerbation, and the defervescence the same number of hours to come to the normal point; so that the whole paroxysm measures seventy-two hours, which is quite uncommon for a spell of malaria.

MALARIAL FEVERS.

FEBRIS—FEVER.

Febris is a generic term, but I shall limit it to those cases that are marked by the following symptoms:—

First Stage.—Marked by a depression of the pulse, which lasts for a more or less limited time—from a few minutes, as in simple febris intermittens quotidiana, or for several hours, as in febris congestiva.

Second Stage.—Marked by reaction, increase of pulse, heat of skin, sometimes very dry and again very moist—from a slight moisture to large drops on the surface.

Third Stage.—Depression of the pulse, remission of fever, or entire intermission. This may last for a few hours, as in simple febris remittens, or for three long days, as in febris intermittens quotidiana.

These changes may occur several times, as in all the forms of febris intermittens; or these symptoms may only occur once in the disease, as in febris typhus icterodes (yellow fever). Again, these stages may all run into each other and not be appreciable to the attendant or patient. Rigors occur with heat of skin; again, coldness of skin, with intense heat felt by patient.

In all cases the blood is changed in its constituent elements. There is a decrease of fibrin from 3 in $\frac{1}{1000}$ to 2 or 1.50. No organs are specially affected in all cases, but any one is liable to be congested and influenced during the disease.

Patients in simple cases, pass through all the different stages without producing any appreciable organic change. In malignant cases the disease may settle on any of the vital organs and produce disorganization, and consequently, death.

Specific Causes.—Of these very little is positively known, and of those that are known, or even probable, we will speak when we come to the special disease.

Exciting Cause.—May be the same in all kinds of fever, viz.: intemperance in eating or drinking, starvation, gluttony, exhaustion from labor or inordinate exercise, changes of temperature, vicissitudes of heat or cold, improper clothing, unusual changes of dress, heat of the sun, exposure to rain, mental anxiety, hunger, thirst, venereal excesses, or anything that will depress or excite to an unusual degree the circulation of the blood.

No stage of incubation is known. The severity of the attack is dependent upon the strength of the remote cause and the nervous depression of the exciting cause—neither the remote nor exciting cause is appreciable in many cases.

FEBRIS CONGESTIVA.

CONGESTIVE FEVER.

Having said thus much upon fevers in general, we will now speak of fevers specifically, beginning with that form of malarial fever that is the most malignant.

Febris congestiva is a periodical disease, and is known from the other forms of

periodical fever alone by its severity. A simple attack of remittens or intermittens may be suddenly converted into congestive; and there are congestive types of febris typhus icterodes, febris typhoides, and febris typhus, but I will limit the fever I am now about to describe to those forms that assume a periodical character, and are strictly malarial or marsh fevers.

Diagnostic Symptoms.—Great depression of the vital forces, pulse weak and feeble, skin cold as death, sighing respiration, breath cold; patient does not feel any pain; sighs deeply; says he is burning up; frequently puts out his tongue; great thirst; jactitation, and complains of a sinking away sensation. These symptoms last for several hours, and are followed by reaction, high fever, delirium, very dry skin, or skin may be moist, with great drops of perspiration over the face and hands; pulse full and quick, from one hundred to so many you cannot count them. Patient does not notice anything, talks incoherently, seems sometimes to understand you and will answer your questions in an indifferent manner. If you give him medicine, he will often spurt it out over his bed, on his nurse, or whatever may be near him. Does not seem to see any one. This stage may be so severe that the patient will be entirely unconscious; will not move, but will lay for hours in a comatose condition; passes his stools involuntarily. His skin around the body will be very hot, almost burning, and his feet and hands cold; pulse often becomes imperceptible. These symptoms may go off in twenty-four hours, and the patient become again conscious, or there may be a slight remission. There may be, about the same hour of the day, another return of the cold stage, and there will always be an increase of heat, if the disease is not modified by treatment, in which case the fever may not be so high nor last so long as the day before. If the fever that has preceded this attack has been quotidian or tertian, we may look for these changes on the next or second day, at precisely the same hour. But without treatment the cold stage is liable and will usually come on two hours earlier. Under treatment it may be delayed two hours. These paroxysms may continue from day to day, but if the first day's attack is as severe as I have described, we may expect a fatal result at the third paroxysm. Without treatment the patient often dies in the first paroxysm, more liable on the second, and almost certainly fatal on the third.

There are many forms of this fever, but the above is the type. In many cases there is no perceptible cold stage, or it has occurred in a former chill, not being noticed. Often the stomach is very irritable. Intense thirst; water is not tolerated. *The mind is generally clear* where the stomach and bowels are principally involved. Sometimes the attack comes on with chronic diarrhœa and vomiting, resembling Asiatic cholera, with white foamy discharges, sparkling like beer, or white, soft and flakey, like soft soap. There is in these cases great enlargement of the spleen, great tenderness over the epigastric region. General rigor, even sufficient to shake the bed and sometimes the room. Another form is, where the congestion settles on the lungs. These cases are known by oppression, very quick pulse, difficulty in breathing, a sense of suffocation or smothering sensation, sometimes expectoration of blood. These cases are usually followed by excessive heat of the skin and regular pneumonitis, if not relieved during the stage of congestion, and are most liable to occur in the cold seasons of the year, fall, winter and spring. The paroxysms will be regular, as in those of the brain and bowels. Patient is liable to be delirious, but not entirely unconscious, which hardly ever occurs in the first or second paroxysm. I say paroxysm and chill, for often there is no chill, either subjectively or objectively, either to patient himself or to physician; and this should be recollected, for nine

out of ten cases seen by physicians will not be recognized by these *peculiar symptoms.* I say peculiar, because we presume that there is always a stage of depression, though it may not make itself known to patient or physician by any notable sign. There may be hemorrhage from the bowels, or hematuria, which is usually very alarming to the patient, but not so serious as delirium.

Treatment.—In congestion of the brain, with hot skin, apply cold water to the head, ice water if it can be had. If not, pour such as can be had on the head, until it is so cold the patient becomes conscious; bleed from the temporal arteries, if they are injected and throbbing. Do not open the arteries unless the pulse is strong and full, and never take blood from the general system unless the whole body is hot and the pulse strong. Never bleed in the cold stage, nor use cold douche or cold bath. Apply cups to temples and nape of the neck. If the feet and hands are cold, apply mustard, and cord the legs and arms close to the body with a strong string. It relieves the congestion of the brain and warms the feet by preventing the venous blood from returning to the heart, but does not stop the blood from passing to the extremities through the arteries. If the patient be speechless, whether cold or hot, give him from five to ten grains of hydrargyrum chloridum mitis (calomel) every two or three hours, with loaf sugar. Put it on his tongue and wash it down with teaspoonfuls of water. Do not give enough water to strangle.

Keep up these powders until you relieve the brain, and the patient becomes conscious or is partially ptyalized, which will never take place until the brain is relieved. When the patient becomes conscious, begin immediately with quinine, from five to ten grains every hour, until the head roars or is perfectly under its influence, and then keep him under its influence until the time for his paroxysm has passed several hours.

In congestion of the stomach, with excessive vomiting, draw a blister directly over the stomach and liver, and before the next paroxysm apply about twenty grains of quinine over the blistered surface, and repeat it in two hours, unless the patient feels the effects, and keep it up for hours after the paroxysm has passed. If you do not have time to draw a blister, inject ten grains of a complete solution of quinine, hypodermically, or give the quinine in an injection of warm water, with about twenty drops of tincture of opii, not with starch, mucilage or gruel, for they prevent the quick absorption of the medicine. In these cases the pure calomel, with loaf sugar, is better than any combination that can be made, as it will be more easily retained by the stomach; and even if there is constant vomiting some will be retained and you will finally succeed in relieving the liver and stomach. Where the lungs are congested add Dover's powder to the calomel, about equal parts, and when the gums become sore, or the lungs relieved, move the bowels effectually with two ounces of olei ricini and one drachm of olei terebinthinæ. If this does not act in two hours, repeat, and so on until you have accomplished your object. This done, give quinine pills, one every hour, until quinism is obtained, and continue its effects as in congestion of the brain and stomach. In congestion of the bowels, with frequent purging of white stools or blood, add pure opium or morphine to the calomel, and if this is not sufficient to quiet the bowels apply a blister and give injections of tincture opii and warm water where there is no hemorrhage, and cold water where there is hemorrhage.

In no form of congestion is purging of any benefit, and often in congestion of the brain I have seen patients die with spasms or in a comatose state, that were perfectly conscious before they were purged. This should be *particularly guarded against,*

for you want the mercurial action, and when that is produced the bowels will move of themselves, or from the action of the calomel alone. I have had patients sitting up, and seen them take a simple dose of castor oil, and in one hour take spasms and die. When I did not move the bowels in similar cases the patients recovered. When you remove the irritation from the bowels, it returns to the brain, the congestion is renewed, and the inflammation increased, or carried to effusion of the brain ; then the patient dies. I do not regard convulsions as very serious until after the fifth day, when, if they occur, the patient rarely recovers. If the congestion is not relieved by that time, inflammation is set up, and finally effusion of the brain takes place, and the case is hopeless. I have made many post-mortem examinations in these cases, and I have always found the brain soft and creamy in some part of its convolutions, with effusion. This is the only form of congestive fever that I fear ; for in all cases where the mind of the patient is clear, you can save the patient by the above indicated means. The main point is to quinine the patient thoroughly before the next day, or the returning paroxysm. When the brain is much congested this cannot be done ; you may give from two to sixty grains at a dose, and you cannot stop the paroxysms, but will only make the feet and hands cold and the patient more restless, and retard the action of the calomel ; but we should not wait in any instance for the fever to abate, much less cease, before we use quinine, for without it many patients would never cool except with death. And I have never seen it do any permanent injury. I have seen children made perfectly blind by over doses, but they always recovered their sight perfectly ; and I have seen partial deafness produced, which would last for days, yet all have finally recovered. The point should be to make the ears roar as soon as possible, and then keep them so until all danger of a paroxysm is over, which can be done by smaller doses or at longer intervals. Give both mercurials and quinine in their natural state, as near as it can be done, to get it down the patient. Never use pills ; for I have seen them retained undissolved for three days in the stomach and bowels, either vomited up or passed through entirely undissolved. In mild cases of congestion of the stomach, you may get pills to stay by giving them covered with wafers of dough, or, what is better, the hulls of raisins, squeezing out the pulp and putting the pill in its place. This must not be relied on if there is still vomiting, but you must resort immediately to the blister and quinine, or the quinine injections. When the paroxysm is once broken then you can take time to correct the secretions by milder means, and build up the constitution by mild tonics and good diet. There is no disease that requires more prompt and efficient treatment than congestive fever. There is no time for experiment or for expectant treatment. The patient will surely die if you do not help him. The means are simple and few, but must be administered in efficient doses, and in quick time. Mercury and quinine will (alone) cure the worst cases, if you have time to apply them ; but you must keep the patient alive by other means, to give them time to act. In the cold cases, where the breath is cold, I have used oil of capsici, rubbed over the entire body with brandy, or tinct. capsici compositi (No. 6), or anything that will stimulate. I once brought a little negro girl to consciousness by taking the hot smoothing iron with which the mother was ironing clothes, and applying it to the soles of the feet and calves of the legs until it blistered, after mustard had failed to make any impression. I once saved a negro man by opening the temporal artery, when I believed he was in the convulsions of death. He came to as the blood ran out, and cried, "there! there! I am easy now," and was sitting up in bed the next day. I once saved a young man by giving him pills of quinine

in raisin hulls, when water would not stay on his stomach, and he was both salivated and blistered. I did not have time for injections, or for the application of quinine on the blister. He did not vomit after the first pill was given, and he had repeatedly tried to swallow the solution and quinine in pills without the covering. I gave five-grain pills every half hour, until six were taken. I saved my own son in congestion of the bowels by a quinine bath when I could not get injections to be retained, and he could not swallow quinine in solution or in pills. I put him in every half hour for ten hours, and kept him in just two minutes. In this way I made his head sing and kept it singing for fourteen hours. I was saved myself in an attack of congestion of the stomach by blisters and seven mustard plasters kept on all day, and my brother-in-law to keep my hands under the cover. I could not swallow water, and the quinine over the blisters could not be applied in time, and injections were not tried. When I reacted I was nearly a solid blister, as all the mustards took off the skin; I had them down my back, on my hands and feet, and a blister over my stomach and on the nape of the neck. The fourth day after reaction I was as near the lower regions as I have ever been, and *hope I ever shall be.* The skin came off from between the tendons on my legs and arms, and I had great sores on my breast and abdomen. I believe I should have died but for these severe counter-irritants. I was then a student of medicine in Raleigh, Tennessee, and the use of quinine endemically was not known, and that by injection never practiced by the physicians of my acquaintance. My mind was perfectly clear, and I distinctly remember everything.

I have said but little of the pathology of this disease, though I have made many post-mortems of all the varieties I have spoken of in this paper, except those of hæmaturia. In those of the brain, as I said before, portions were softened, if the patient lived over the fifth day—much injected with venous blood, nearly black, in the membranes, where they died before the third day—and adhesive attachments after the third day. In the cases of congestion of the stomach the liver was indurated if the patients died in the first three days, and softened and indurated after this time. The stomach was nearly natural in many cases; in others much injected with blood, and filled with greenish, black flocculent matter. Frequently found pills of quinine and calomel in the stomach and bowels undissolved. In congestion of the lungs, in the first three days lungs very black, and would not collapse, were as full out as if blown up with wind, portions injected with pus after this time, other portions black and hard. In congestion of the bowels, nearly the same as that of the stomach, with red patches in the intestines, and abrasions in the mucous coat, and sometimes hemorrhagic points. I never made a post-mortem in a case where there was hæmaturia, nor have I attended a case that died, but I have heard of many deaths with this prominent symptom. (See article, Hæmaturia.)

Prognosis is favorable in all cases except in congestion of the brain, and of these I have usually saved two out of three. I never feel uneasy if my patient is conscious, and I can have time to administer the proper remedies. All forms are certainly fatal without treatment prompt and active. I knew a lady to sit up and pour out coffee for her family at breakfast and die before night, before any medical assistance could be obtained. I have known patients to be at work when the chill was on them, and when the fever rose become delirious. I have known attacks to come on in the convalescence from acute diseases and prove fatal in a few hours; hence the great importance of giving quinine as a tonic in malarial districts, when there has been no chill to give us warning. If the stoutest negro man breaks his leg in the

Mississippi or Brazos bottoms, and you have to confine him and keep him on low diet, he will have chills and high fever, which will soon run into congestion, and he will die comatose; hence, now, I almost invariably give mercurials and quinine as prophylactics, especially if they have had periodic fever at any time before the accident.

INTERMITTENT AND REMITTENT FEVER.

It would seem to be presumption in any one now, to attempt any improvement in the history or pathology of the above diseases, especially for a Southern community, where every one is able to cure these diseases. Notwithstanding all this, I have undertaken the task, and have introduced these subjects as a continuation of the history of malarial fevers. The very able paper upon the cause of Malarial Fever, in the February number of the *Galveston Medical Journal*, 1866, from the pen of Prof. Salisbury, has, in my humble opinion, settled the etiology of this class of diseases. Ever since I heard the lectures of Prof. J. K. Mitchell, upon this subject, I was disposed to believe in the cryptogamic origin of intermittents, etc., though I did not have demonstrative proof of the fact; and my faith had been shaken in this belief, by reports from Prof. Leidy, of his examination of the marshes with the microscope—he could find no trace of any spores, cells, or fomites that could be considered the cause; he set aside my belief in there being any more truth in Prof. Mitchell's theory than the thousand theories that had preceded it. But now we have another Richmond in the field, and he has fairly won his spurs. If his facts are true, his conclusions are inevitable, so far as his theory of the etiology is concerned. But I have not the same confidence in his opinion of the "*modus curandi*" of the salts of quinine. Nor have I any confidence in the opinion expressed by Dr. Shaw, in the November and December numbers of the *Saint Louis Medical and Surgical Journal*, 1864, of the identity of the congestive type with cholera. These two papers have induced me to take up this subject, and I shall express myself fully and freely; I claim to have some experience in all the forms of malarial fever. Having been raised in the Mississippi bottom, and practiced medicine there for eight years, and eight in the Brazos, of these diseases I can speak what "I do know, and testify of what I have seen." I gave, in the January number of the *Galveston Medical Journal*, my experience in reference to the congestive type. I also, herewith, reproduce an article on the spleen, from the *New Orleans Journal*, which was written at the suggestion of Prof. Bowling, of Nashville, who stated in his lectures, that the spleen never suppurated below the latitude of 35°, and gave as his authority the late Prof. Drake. Now, in *this paper*, I shall, as much as possible, endeavor to avoid repetition; but nothing I have read or since seen has in the least changed the opinion there expressed.

FEBRIS INTERMITTENS—INTERMITTENT FEVER.

This is the mildest form of malarial fever, or, as it may be more specifically designated, gemiasmatic (earthmiasmatic) fever. Miasma may be of animal or vegetable origin. It may arise from the excreta of the human body, or from aerial or telluric gases; but I will assume that Prof. Salisbury is right, and that this class is produced from the spores of the different Palmellæ.

Symptoms and Varieties.—Intermittent Fever is described by its name—it is a

fever that intermits. It is diagnosed from Remittent Fever, which never ceases, but abates at some time during its diurnal course.

In Intermittent Fever we have a complete intermission at some time in the twenty-four hours after the first chill, or the commencement of the stage of depression. This intermission may be only for one hour; but if there is a complete intermission—no heat of skin, no increase of pulse, no excited respiration—we call it an *Intermittent.* If there is a lessening or decrease of the pulse, with a lessening of the heat of the skin, and also of the respiration, but not complete intermission, we call it *Remittent*—whether this remission last from one to several hours; all we wish to know is, that there is a complete paroxysm; that it has gone through the regular stages—*Chill, Fever, Sudorification, Restitution.* Without these stages, we call the fever *Febris Continua.*

FEBRIS CONTINUA COMMUNIS—COMMON CONTINUED FEVER.

This may also arise from gemiasma, and I shall class it under the head as arising from this cause, and therefore belonging to this genera; it being that form of malarial fever in which there is no intermission or remission of the fever; or, to be more specific, no perceptible abatement of the fever after the first chill. The three stages being blended into one, and making no change perceptible to patient or physician, that is, either subjectively or objectively: no great change in the heat of the skin, the beat of the pulse, or perceptible sudorification.

VARIETIES OF INTERMITTENT FEVER.

Febris Intermittens Quotidiana—Daily Intermittent.—This variety is known by a distinct *chill*, a rise of *fever* (heat of skin), a *sweating* (sudorification), and a stage of *apyrexia* (restitution), once every day, or once in twenty-four hours. This chill may come on at any hour in the twenty-four; it may last only a few minutes, or it may last for several hours. It is followed by heat of skin, which may also last only for an hour (I believe this is the shortest time I have seen in any case), or it may last twenty or twenty-three hours; when it is followed by a cooling down of the skin, and a perceptible moisture of its surface. This moisture may scarcely be perceptible, or it may be in large drops of sweat on the hands and forehead, and a general wetting of the clothes and bedclothes.

Chill.—This may be only a few cold streaks running up the back, or it may be so severe as to chill the whole body as cold as death—the breath even being cold. The hands and the feet may alone get cold, and there be heat of the body. The skin may shrink, forming the cutis anserina (goose-skin); the nose and lips may become bleached, cold, and sometimes livid; the finger nails become blue; the voice weak and tremulous; or the patient may shake in every muscle, and even shake the bed; and I have seen cases that shook the room.

This chill is generally attended with pain in some part of the body, and a general bad feeling—a malaise; pain in the head, back, bones, or any of the viscera. I have seen it affect alone the mammæ in women and the testicles in men; there being at the same hour each day an acute pain in the breasts, accompanied with rigors, and followed by fever. Most usually the head is the seat of pain—feels hot; throbs; patient becomes dizzy; head swims; turns blind after stooping, with white spectre floating before him for several seconds. The stomach is next usually involved: patient is sick at the stomach; vomits or eructates, often, large quantities of yellow bile; but often, bile of a dark-green leafy character. The bowels may

move, and in some forms the stools will foam like soapsuds; will be white like milk, mixed with the usual alvine evacuation. Sometimes patient will urinate blood in large quantities (see article Congestive Fever). Sometimes the lungs may be involved, and the respiration may become oppressive; and when the fever arises, may be emphatically called *snorting*. I saw one case of congestion of the lungs which proved fatal, in spite of all I could do, in the first chill—being present when the woman, a stout negress, came from her field-work with a chill on her, dying the next day. Post-mortem revealed the lungs completely congested, and solid as the spleen, and much like a hypertrophied spleen. I have seen it affect the eye alone, and also the internal ear, as the breast and testicles—no pain being felt anywhere except in these organs. I have also known it to affect the sciatic nerve, and I may say all nervous centres—fever following the chill, with this acute pain at a particular hour of the day.

Most Usual Time of Chill.—I believe I may safely say that more than two-thirds of the chills come on between daybreak and twelve o'clock; next most frequently from twelve M. to dark; next from dark to midnight; and lastly, from midnight to daylight. I believe nine-tenths occur from daylight to dark, chills at night being the exception. The time of attack is no doubt controlled by the time of exposure to the external air that contains the poison, and to rain and change of temperature. I am fully satisfied of this, from my experience in the army. Of those doing guard duty, the greatest number had chills at night. This was so much the case at this post, that I often thought they were malingerers, and ordered the sergeants to watch them, and see if they had a rise of fever after the chill; I would not excuse them from duty unless they reported at the time. I have, also, observed this in the negroes, who are out much later than the whites, and live in much more open houses, and with less covering. They have chills much oftener in the night than the whites. Chills are much more frequent in wet than dry weather, and on sudden changes from warm to cold, and less from cold to warm. The season has also great control over chills. They are more frequent in September (where I have practiced), than any other month, and less frequent in May. I think I may safely class them thus, for the twelve months: September, 18 per cent.; August, 16; July, 15; October, February and June, 10 each; November, 9; December, 8; January, 5; April, 2; May, 1. Thus, during the summer months, June, July, and August, 39; fall—September, October and November, 38; winter—December, January and February, 18; spring—March, April and May, 9. Of primary attacks of persons coming from healthy districts, I believe at least ninety per cent. occur in June, July, August and September. If they escape September, they are not liable to have them until the following June.

Febris Intermittens Tertiana—Second Day Chills and Fevers—Intermittent Fevers of Alternate Days.—There is nothing peculiar in this form of intermittent fever. It has the same stage—*Rigors, Calorification, Sudorification, Restitution.* This is usually the mildest variety, and I believe the only TRUE TYPE OF THE DISEASE. When the quotidian type appears, it is a double tertian, and consequently is much more severe, for the stage of apyrexia (restitution) is shorter and the system does not have time to rest. I am so thoroughly convinced of this being the true type, that in all cases of quotidian I give quinine two days in succession, whether the patient misses the first day or not; but when I have broken the tertian type, I have no fear of a return on the fourth day. I apply this to all the various types, whether febris congestiva, quotidiana, or tertiana. In *febris continua communis*, assuming that these stages are massed, I give quinine each day until the fever is broken; watching my

patients closely to find the hour the chill should come on. Now, I am led to these conclusions from the fact that if we partially check a remittent it becomes an intermittent; partially break a quotidian, and generally it will continue the second day; partially stop a tertian and it will appear on the fourth day; making a quartana with the same stages as the other varieties. Then we may reduce all these varieties to one type, the tertian; so the whole class might be arranged under this one head; but as the types are well marked, it is best to retain their present nosology.

The books speak of septinians, octans, etc. I have never seen these. I do not believe in their existence, but believe that they are the result of treatment; the treatment not being continued sufficiently long to destroy the cause, and these are relapses. I have never known a chill to come every fourth day, and continue to come every fourth day; it will, on returning on the fourth day, take the quotidian or tertian type, and so continue to recur until relieved by medicine; or by increasing the morbific cause, we have a double tertian, viz: a quotidiana. These quotidians may occur with a paroxysm in the morning one day, and in the evening the other; showing most plainly that they are double tertians. Again, we may have a chill in the morning and another at night in the same twenty-four hours, and one day and night (24 hours) free from the fever; showing the patient is laboring under two tertians occurring on the same day. But all these different varieties are very rare, and according to my experience, in the following proportion:

Febris Intermittens Tertiana,.....	50 per cent.
" " Quotidiana,.....	40 " "
" Remittens,.....	5 " "
" Continua,.....	4 " "
" Quartidiana, et omnia genera,.....	2 " "

The remittents are most common in June, July, August and September; but seldom occur in the other months, unless complicated with pneumonia, etc. The quotidians, also, are most usually confined to the above named months, and their occurrence in the other are the exceptions.

Febris Continua Communis may be diagnosed from *Febris Typhus* and *Typhoides* by the tongue being covered with red, white, or brown fur; by the skin becoming at times moist; by the want of ulcerations of the solitary or agminated glands; want of sordes on the teeth; by tenderness over the liver and spleen, and by considerable induration of the spleen; by the want of bile in the stools, and the exemption from grumous watery discharges—stools being mucous, scybillæ, and usually attended with constipation. This type is often produced from improper treatment, in which quinine has been given, and stopped the chill and sudorification, but left the system depressed, and the liver and abdominal viscera generally in a congested or inflamed condition. Hence, quinine rarely relieves these patients until efficient evacuants and mercurials have been used, to subdue the congestion and inflammation. When the fever, in these cases, is once broken, they are, as said before, liable to become quotidian or tertian, showing their generic origin.

Pathology.—All forms of this gemiasmatic fever more particularly affect the liver, spleen, and stomach. These are more or less affected in every instance, whether the mildest tertian or the most malignant congestive. They are each liable to congestion and inflammation; but as I have dwelt sufficiently on its pathology in the other papers, I shall not reproduce them. I have never seen a fatal case of either quotidian or tertian without congestion or inflammation; but they are prone to these results

during the summer months; more particularly do we have congestion of the brain and corda spinalis, and the liver and stomach, during the hot seasons; congestion of the lungs in winter, and congestion of the intestines in the spring and fall.

I do not believe that the congestion of the intestines, in this fever, is like the collapse of cholera; yet I know the two diseases to be perfectly distinct. One may stand over a congestive fever for days; may sleep in the same bed, live in the same town or house for years, and not have a sick stomach. I have known men to live twenty years in malarial districts, and never have a chill. Can we say as much of one exposed to cholera? I trow not. I know I would be afraid of the trial; and I have slept with hundreds of cases of congestive and intermittent fever and never had even a headache. Then, I wholly condemn the opinion expressed by the contributor to the *Saint Louis Medical and Surgical Journal.* I *believe,* I *know,* cholera is infectious. I believe, yea, *I know, Intermittent Fever is not.* I know cholera will not return regularly on every day or every other day, and I know intermittent fever *will.* I know intermittent fever is an endemic disease; I know cholera is not, in this country. It is a disease of one paroxysm. Intermittent fever is known by its regular return. I believe the causes are different—yea, *I know it.*

Treatment.—This must be adapted to the four different conditions. Rigors, Calorification, Sudorification, and Restitution.

Rigors.—During the chill very little should be done, or is necessary, in the mild forms—simply going to bed and covering up warm with blankets. If there is much nausea, apply sinapisms to the stomach, and give ⅛ to ¼ gr. of morphia, and apply hot bricks, or bottles filled with hot water, to the feet and hands. Give stimulants of brandy or whisky: by any or all means keep the skin warm, and prevent the internal congestion.

Calorification.—The heat may be controlled by letting the patient drink freely of cold water. Give sweet spt. nitre and aconite. If there be much pain in the head, give at once mercurials. I usually give

℞. Hyd. chl. mitis,
Ext. taraxici,
Rhei. pulveris, āā grs. xij. M.
Fiat pills No. 6.
Sig.—Give three at once and the other three in three hours.

This combination generally acts well without castor oil, which is usually so disagreeable to many patients. If this should not act freely, I usually give

℞. Hyd. chl. mitis,
Pill hyd., āā grs. x. M.
Fiat pills No. 3
Sig.—Give at once.

I thus excite the liver and subdue congestion and prevent inflammation. This being done, I leave my patient to rest and quiet, until about six hours before the next chill should return. I then begin with quinine pills—

℞. Qui. sulphatis,
Ext. sarsaparillæ, āā grs. xij. M.
Fiat pills No. 6.
Sig.—Give one every hour, until all are taken.

I make it a point, in all cases, to give enough quinine to affect the head, to produce roaring in the ears, or perfect quinism at the hour of the expected chill. If I

do not see my patient until one hour before the chill, I give the ten grains at once and stop the chill, and give at night the mercurial, and the next day the quinine and taraxacum.

Where there is a tendency to dropsical effusion, and an enlarged spleen, I give the quinine with iron and a diuretic. Thus:—

℞. Qui. sulphatis,
Ferri lactatis, āā xij M.
Ext. digitalis, grs. iij.
Fiat pills No. 6.
Sig.—One every hour until all are taken.

I use also in these cases qui. et ferri citras, qui. sulphas, equal parts. Quiniæ sulphas and ferri et potassæ citras, equal parts.

When the chills come by habit, or have lasted for months, or years, I give the following:—

℞. Quiniæ sulphatis, ℥j
Acid arsenioci, grs.ij
Ext. sarsaparillæ, ℥ss. M.
Fiat pills No. 30.
Sig.—Take one every two hours until five are taken each day, continuing daily until all are taken.

This hardly ever fails to completely break them up, and they are not apt to return, and if they do, repeat every ten days these pills, allowing the patient ten days' rest. I am particular to see that the arsenic is intimately mixed with the other ingredients, and if there be any swelling of the eyes or face, stop at once and resort to the quiniæ, digitalis and iron pills, or simply quiniæ et ferri citras, in three-grain pills every two hours before the chill comes on. I have learned from practice the amount of quinine each patient will require to stop a chill, but rarely more than twelve grains are necessary, if the patient be under its influence at the time the chill is expected; but I have been compelled to give as high as eighteen grains to a boy three years old to stop a chill, having tried smaller doses and failed. So I have given as high as sixty grains to an adult and stopped the chill, when I had tried thirty and failed. When the tongue is foul, and covered with white fur, I usually give the quinine with some stimulant, thus:—

℞. Qui. sulphatis, grs.xviij
Olei. piperiti nigri, gtt.iij
Ext. sarsaparillæ, grs.xij. M.
Fiat pills No. 6.
Sig.—One every hour until all are taken.

Or I use piperine instead of the oil, when the latter disagrees with the stomach, which it will often do. This *plan never fails* when pursued sufficiently long, and actively enough to suit the case. Often, I have had to give much more calomel than here recommended, to produce a complete revulsion of the secretions from the bowels. I never give it with the intention of severely purging my patient, but simply to excite all the secretions. I move the mercury off to prevent ptyalism, which is wholly unnecessary, very injurious and painful. I never use emetics (proper) unless in the continued type, when I often use the following:—

℞. Hyd. chlo. mitis, grs.x
Antimonii potassæ tartratis, grs.ij
Ext. taraxici, grs.x. M.
Fiat pills No. 3.
Sig.—Give at once.

This will often check the fever and produce vomiting, move the bowels well, preparing the patient for the quinine. I frequently give leptandrin and podophyllin with calomel. But these are too active in their purgation and frequently nauseate, and the mercurial is about as effectual without them as with them.

GENERAL REMARKS ON TREATMENT.

As I said in congestive fever, quinine and mercury will cure all cases; other remedies are mere adjuvants and placeboes. They must be added according to the special pathology of each case, and are not really necessary to the successful termination of any case. In the Brazos or Mississippi bottom, I would not feel that my patient was safe during the summer months, unless I knew I had given him enough quinine to prevent congestion. I have never tried anything that I could rely on implicitly, except it or some of its various preparations, given in the above named strength. When I have done this I can go home and sleep soundly, assured I will find my patient alive and improving on the next day. You can stop and often cure intermittent fever with a thousand things—but not so easily in a malarial district in the summer—none of which would I recommend when I had the above at hand or could procure them; but it may be you cannot get them; you should know how to treat cases without them, and I will simply state the substitute for calomel.

(*a.*) 1st and best, emetics. Given in the first paroxysms, these cause a full flow of bile, and produce profuse perspiration if given before the stage of inflammation. The best of these are tarter emetic, lobelia and ipecac.

(*b.*) 2d. Purgatives, leptandrin, podophyllin, taraxacum and sulphate of manganese. This latter salt is of much value in cases of enlargement of the spleen, and general anæmic condition.

(*c.*) Blisters over liver, stomach and spleen. These will often restore the secretions without anything else, but they are severe remedies.

(*d.*) Bleeding. This in the continued form does good, but should never be used in the other varieties. We are liable to have fatal congestions, diarrhœas, and a tedious convalescence.

(*e.*) Cupping over the oppressed organ, always does good, but is scarcely ever necessary, the patient being relieved without it.

SUBSTITUTES FOR QUININE.

(*a.*) Sudorifics. The best and most successful is a decoction of shucks, or fodder, drank warm, every hour or half hour, as quinine is taken.

(*b.*) Salicin. This is never certain, but often successful; so are teas of the bark of the willow, and its extracts.

(*c.*) Tea of the bark, or extract of the button willow, cephalæ occidentalis.

(*d.*) Solution of brandy and camphor (camphorated spirits). This was much used by the hunters in the Mississippi bottom, given to their patients, tablespoonful every hour, just as we give quinine. It was from them I learned the use of fodder and shuck tea.

(*e.*) Corn meal. Tablespoonful in a glass of water just before the chill.

(*f.*) Shower bath. This will do where the chills come by habit, and where the patient has removed from the malarial district, or where there is congestion to insensibility, with excessive heat of skin.

(*g.*) Excitement of any kind at the expected attack, or stimulants.

Salicin.—Salicin I have used in from three to five-grain doses every hour, with

success; but it is not certain, and is more costly than quinine when used in sufficient doses to cure a case.

Chloroform.—I have tried this in from half drachm to drachm doses in a glass of water, or dissolved in olive oil or glycerin, given every two hours, about the time of the expected chill. Surgeon Ganslen and Prof. A. P. Merrill have used chloroform with success, and speak in high terms of it.

Cornus Florida.—The different varieties of this shrub have been used, both in extract and tincture with success. I believe it has considerable virtue, especially when combined with quinine.

Fowler's Solution of Arsenic.—The liquor arsenialis, combined with any of the vegetable tonics, is very successful; especially when patient is removed from the infectious district; though I much prefer the arsenious acid combined with quinine, as given in the treatment.

Prophylactics.—The following are beneficial; use of pepper for food; drinks of strong coffee; morning drams; fire in apartment at daylight, and closed windows and doors at night; use of cistern or spring water. No pool or running water should be used in a malarial district; keeping the feet dry and warm, and living upon rich and generous food.

GENERAL REMARKS.

I have not tried the sulphates of potash and bromine, after the Italian plan, but I know the use of sulphates of soda and magnesia will produce the disease in the malarial districts; I have no faith in Polli's theory, of the sulphates destroying the zymotic action in the system. I believe the good effects of the salts of mercury and arsenic result from their power to destroy the primordial cells in the system, whether they be animalculæ or palmellæ. Nor do I believe the good effects of quinine are due alone to its tonic power; for we know that unless the system is under its influence at the expected chill, and the chill returns, we will have to give the same amount of quinine the next paroxysm—almost as much as if we had not given any; and hence the importance of giving the quinine during several hours; where there is no perceptible paroxysm, give it during the whole twenty-four hours, and the fever will abate the next day. We could do with much less quinine if we knew the exact hour, and would give all our quinine at once. I believe we might lessen it at least one-half; say six grains, given one hour before, is more efficient than twelve given for six consecutive hours. We are forced to extend this time; for if we wait, the chill may come on one hour earlier, and we will be too late; and again it may be postponed, and the effect may go off and the chill then return. This will often happen under our present plan, unless we put our patient under the influence of quinine and keep him so until several hours after the time of the last chill. Quinine has an immediate and direct effect. All its salts have the same effect, and are equally efficient if given in the same doses, whether valerianate, citrate, ferrocyanate, etc. If the Italian theory was true, the sulphate alone would do good; and if it owed its virtues alone to its tonic effects upon the brain, it would have the more good effect if given just after the chill than just before the chill. It is just as efficient to stop the paroxysm when given with fever, as when the fever is gone, provided there is no inflammation in the system, and it is kept up until the chill should return. It is of no use to give it immediately after the chill, and it will usually aggravate the symptoms, causing deafness, headache, and amaurosis. I believe it gives vitality to the blood, and prevents stagnation and death of the globules,

and thereby prevents it from becoming the nidus for these palmellæ, and this sustains the miscroscopic pathology of Drs. Richardson and Meigs, which has been but recently advanced.

It will be seen from the above papers, that we are still in the dark on many points connected with well-known and well-described diseases; and one over which we have more remedial control, than any other of which I am familiar. Any Southern planter, though he may not know a letter, can treat, and usually very successfully, using but three articles, calomel, quinine and castor oil; they usually give from ten to twenty grains calomel; and in from four to twelve hours, one ounce of castor oil, and then from twelve to thirty grains of quinine. This never fails unless they mistake the disease, or there are complications which they do not understand. I may safely say that the stewards or overseers on our plantations cure more than seventy-five per cent. of these cases, without consulting a physician.

FEBRIS HÆMATURIA MIASMATICA.

(HEMORRHAGIC MALARIAL FEVER.)

VARIETIES.—1. *Hæmaturia Miasmatica* (*Malarial Hæmaturia*).

Symptoms.—Chill; fever, with free discharge of bloody urine; hemorrhagic urine ceasing with the decline of the chill and returning with next paroxysm, and with it the skin turns a bright yellow, and remains so until convalescence. Urine bright-reddish at intervals between the paroxysms, or may continue until complete suppression, which is always fatal. Sometimes the urine is profuse, though mixed with blood which is a favorable symptom. Most cases recover when the urine is freely discharged, though the case will be tedious and recovery slow.

2. *Remittent Hemorrhagic Fever—Symptoms.*—This variety is usually attended with enlargement of the spleen; almost constant fever; reddish tongue; skin sallow, hardly to be called yellow. Liver tender and enlarged, as well as stomach; urine high-colored, no apparent blood, but a dark, brownish sediment. Skin contracted over the muscles, puckered and flabby; patient sick at stomach; vomits easily, and sometimes blood; passes sometimes a dark, vitiated, very offensive stool, usually watery, black, and amounting to a continued diarrhœa. The face, eyes, skin, and everything shows malarial poison. Patient usually has had chills for years; perhaps lived in the district, and fought mosquitoes and drank river or pond water, most of his life.

Cause.—Undoubtedly the main and only predisposing *cause* is *malaria*. The exciting causes are many—bad food, bad water, and some say, bad whisky; but this, I think, is a mistake, as alcoholic drinks are, to a certain extent, prophylactic; but when an attack comes on in one who is dissipated, it is almost impossible to do anything with the case, as uræmia sets in at once. The imperfect cures from former attacks, by quinine and stimulants, without evacuants and alteratives, leave the glandular system oppressed, especially the liver and spleen. This is, in my opinion, the main cause of hæmaturia, and the only reason it is more common now than twenty-five years ago. In my early days I was taught and practiced (in 1846, and on) to always prepare my patient for quinine, and not to give it in a case with a hot skin in the febrile stage. This I have never abandoned, unless, as before stated,

called to see a case I was afraid would die before I could break the fever by any other means, and then I always combined it with a sedative or mercurial. We did not see the quinine bottle sitting on the breakfast table as regularly as the salt-cellar, which is now the case in many families; each one who had a fever the day before must take a dose before he eats his breakfast. This is the reason why the type of remittents is changed, because the kidneys are made to do what the skin, liver and kidneys did in health. They are over-worked, become congested, and the quinine given diverts to the kidneys. Now this is abusing a good thing; in 1868, when I suggested, in my Journal (Galveston *Medical Journal*), preparing the system, before the administration of quinine, I was taken to task by several friends, and accused of being opposed to the use of quinine. Nothing was further from my thoughts; but there is a *time to give quinine*, and a time when it should not be given. To give quinine day in and day out, to prevent fever, is useless; the patient will get used to its effects, and it will become inactive; chills will return with the usual dose of quinine taken, fevers will rise, and the destructive process will set in even worse than if the quinine had not been taken. Just as I said of alcoholic drinks, I know they will act as a prophylactic, but if taken too constantly, or in too great quantities, they stop the secretions, and prove poisonous.

Quinine, as I have said before, in speaking of its use to prevent intermittents, should not be given in the hot stage, unless to prevent fatal congestion, and only for three days in succession. To continue it longer is useless, and I believe injurious; but leave an interval of five days and begin again; you will see we cured the worst spleens on the Mississippi in this way, where the patient was constantly exposed.

In 1854 I had a stout negro man to have the disease, which I have mentioned under congestive fever. I treated him promptly with mercurials and quinine, and he recovered. While living at Columbia, in 1857, I saw several cases. Two families suffered in particular—Drs. Dunlap and Morris, brothers-in-law, having married sisters, Misses Harris, of Alabama; three of the family died. Two families of the Phillips' living on the Bernard had the same disease, and several died. I treated all my cases as congestive fever, and did not lose one. I did not have a case to turn yellow.

In Galveston, in 1865 and 1866, I saw two cases in hospital, and Prof. J. H. Webb and two or three of his family had it, twelve miles down the Island. In 1867 or 1868 Dr. Webb lost a daughter. Dr. Boring's family had it also, if I recollect right. They lived neighbors. These cases all turned yellow, and Prof. Webb brought me some urine, which I tested for albumen and examined for blood globules. I found a large proportion of globules, few crystals of uric acid, and the urine was decidedly albuminous. Col. W. P. Gains, whose wife was also a Miss Harris, came to Galveston in 1870, with his little boy, Beauregard, ten years old. He had had a bilious attack at Calvert, where he was then living, but was well, but slightly salivated. He took a chill and had a fever one day. He sent for me, as I had practiced in his family while I lived in Columbia. I found him with a moderate fever, but as he was salivated I recommended tincture of aconite, five-drop doses, to cool his fever, and some citrate of magnesia solution to move his bowels, and sent him out twenty-four grains of quinine, to give twelve the next day before his chill-time. When I went out next day I found he had given all the quinine, twenty-four grains, in about four hours, and the little fellow had scarcely any fever, but was passing bloody urine. The Colonel was much alarmed, and wanted to send off for all the

doctors of eminence in the place. I told him it was the effect of the quinine, and as soon as the quinine effect went off it would cease, which it did, but we were afraid to risk him the next day without quinine, so we gave him twelve grains, and as soon as he got under it the hæmaturia returned but not so bad. We gave him the tonic mixture, tinctura cinchona, colombonis, and gentianæ, for some time, and he had no bad symptoms. This case demonstrated what I have said. I have treated all the cases without losing a case, and I can say that I *never*, from my first year, lost a case of malarial fever if the brain was free from inflammation and the patient conscious when I took charge of the case.

As my experience is quite limited in this disease, I give a report from one of my confrères whom I have great confidence in, as he has had a large personal experience.

REPORT OF D. R. WALLACE, M. D., OF WACO, TEXAS.

In submitting the result of such cursory and imperfect investigation as we have been enabled to institute of the grave malady, hæmaturia miasmatica, your committee beg to state that in the performance of the task imposed the purpose has been to bring before you for consideration such phases of the disease as, from the obscurity involved, or unusual manifestations accompanying, call for and justify special inquiry and examination, rather than to attempt an exhaustive investigation. The prime desideratum in the nomenclature of a disease being that the name shall, as nearly as practicable, be expressive of the pathological condition existing, and of the part implicated, those who have given the public the benefit of their observations in the medical periodical literature of the past few years, since the disease has, from its prevalence and fatality in most of the Southern country, attracted attention, have, from their different stand-points of observation, or peculiar views entertained of this somewhat *newly arrived* in the domain of nosology, and claiming a suitable appellation as appropriate to its character, exhibited their ingenuity in the number of *designatives* with which they have honored it; as specimens of which the following are reproduced: Hemorrhagic malarial fever, green jaundice, black jaundice, miasmatic hæmaturia, cachæmia, hæmorrhagica, icterode pernicious fever, malignant congestive fever, yellow remittent, interior yellow fever, purpuræmic fever, yellow disease, canebrake yellow fever, swamp yellow fever.

It is noteworthy that, while no special pathological condition is indicated, all point to the blood, either directly, or by necessary implication. Whether this has its origin in *appearances* only, which do but strike the senses, serving the while to mislead the judgment—the primary morbific blow being death elsewhere—is left sub lite. It is suspected, after a somewhat careful examination of what has been written, and a pretty close scrutiny of clinical facts, that a name going nearer to the primary lesion, more expressive of the true nature of the malady, might be suggested—a name indicative of its most characteristic feature—one which, though existing in other diseases, is believed to cut a figure in the train of morbid phenomena in this, entitling it to a consideration it has not yet received. The allusion will be understood, when the pathology of the disease, the place for it, is treated of. Of infrequent occurrence, for the last decade or two, in the Southern country, it has no history as a distinct disease prior to 1867–'68, when, from its frequency and fatality, it began to attract the attention of the profession.

Numerous communications, contributed by eye-witnesses, some of no mean merit,

have since appeared from various portions of the country. So little was known of it prior to this time, that so well informed authority as Dr. Austin Flint, as late as 1868, seems to confound, or rather identify it with the intermittent or paroxysmal hæmaturia, reported in the Edinburg *Medical Journal*, May number, 1868, by Dr. Headlam Greenhow, a disease of the British Islands, originating from exposure to cold and wet, never from malaria. Diversified as medical opinion may be in other respects, in regard to its etiology all are agreed that it is malarial. The circumstances under which the disease makes its appearance remove all question as to its cause. *Obitur*, it might occur to a disciple of the "change of type" school to put the question to one of the *no change* way of thinking. Why is it miasm produces this form of disease now, seeing it did not do so formerly under circumstances apparently more propitious than those which have existed since its general prevalence? It will be seen at once that the change of typists, who are generally, if consistent with themselves, neuropathists, find no difficulty in accounting for it upon the supposition of a generally lowered condition of vitality, while the advocates of the no change theory, looking through their humoralistic glasses, as they most commonly do, satisfy themselves with a denial of the facts. The fact, whatever the explanation, is noteworthy, and may prove significant.

The diagnosis will delay but little. No trouble in assuring ourselves of this fell presence. The usual symptoms presenting in other forms of malarial disease, present in this; more restlessness, jactitation and retching; a more gaseous pulse; finally, the characteristic discharge from the bladder settles the matter. With no disease known to the nosological annals of this country is there danger of confounding hemorrhagic malarial fever. Simulating, in its most characteristic symptom, cystic hæmaturia of Southern Africa and the Nile valley, caused by ciliated animalculæ, and intermittent or paroxysmal hæmaturia, already alluded to, yet differing in other symptoms and circumstances of organization, toto cælo, from these, its differential diagnosis presents no difficulty. We approach a portion of our inquiry, the pathology of the disease, directing and controlling, as it does, all rational therapy, having paramount claims in our investigation. Recognizing this fact, almost every observer, who has given the profession the benefit of his observations, has conceived himself under special obligation to explain the pathological conditions involved, and while there has appeared, as was to have been expected on so obscure a subject, great diversity of opinion, no little ingenuity has been displayed, under circumstances, too, most generally so adverse to accurate research as to dampen the ardor and discourage the efforts of any save the most resolute. This statement will be appreciated, when it is remembered that the observation embodied in, and the conclusions arrived at, in these communications, were made and deduced not seldom in the cabins of the poor, remote from those appliances with which, under more favored surroundings, science is wont to conduct her votaries in their obscure explorations.

Another illustration of a great fact in the history of medicine, never to this good hour sufficiently appreciated, that the great granite rocks of truth and fact, which enter into the foundation and constitute to no small extent the superstructure of medical science, have been dug out of the quarry by the laborious country practitioners, who, though performing the labor, got none of the honor, this being reserved for the few, who, favored by fortune with more leisure and nicer appliances, polish and adjust them in that great temple of medical science, whose glittering sheen fixes the admiration of the world. One of the earliest of these pioneer explorers—a man whose broad, practical good sense, powers of accurate observation and extensive

learning, would make him an ornament to any walk or department of our noble art—Dr. J. M. Morrison, of Hearne, Texas, published his views in an essay, entitled "Jaundice with Hæmaturia," in 1867. Without indicating any opinion as to where, or in what way, the primary impression is made, resulting in a series of morbid phenomena, which, taken together, constitute the disease, he holds that the hæmaturia is to be explained thus: the effete blood corpuscles not being removed from the circulation by the secretion of bile, as in health, become eliminated by a vicarious action of the kidneys; that they thus assume a state of congestion, predisposing to hemorrhage; that in this condition of the venal organs the blood itself is retarded in its course through the abdominal viscera by inaction of the liver, the while taking on a more hemorrhagic tendency, in consequence of not receiving that peculiar impress it is the office of the liver to impart to it—said tendency being heightened by the solvent principles contained in the bile acids, resulting in hemorrhage. Dr. Charles P. Gordon, of Dalton, Georgia, reads in the hæmaturia "an active congestion and inflammation of the venal organs, attended with all the danger and fatality consequent upon an obliteration of their proper function, and of a retention in the blood of those elements excreted by them." Dr. W. A. Greene, of Americus, Georgia, delivers himself thus on the subject: "The exhaustion, stupidity and low muttering delirium indicate derangement of the cerebro-spinal, and the alteration of the capillary circulation, and of respiration, of the secretions and excretions, of the structures of the spleen and kidneys, are indicative of derangement of the sympathetic system of nerves. The poison acts primarily upon the blood, altering and destroying its corpuscles." Dr. Michel, of Montgomery, Alabama, states that, in all the cadavera in which he inspected them, "the kidneys were enlarged, presenting the appearance of having passed through several inflammatory actions, in consequence of which the excretion of urea is prevented. It accumulates in the blood, and unless vicariously eliminated must sooner or later produce its pathological effects." Dr. W. D. Broadnax, of Cameron, Texas, in July number, 1872, of the *Richmond and Louisville Journal*, on the subject of malarial diseases, thus discourses: "Malaria produces its first impression on the sympathetic or organic nervous system." Dr. Francis Barnes, *New Orleans Medical Journal*, March number, 1867, in an article entitled "Nerve Force and Blood Changes"—a production of great pretension and some merit—finds the secret of the whole matter, the key that fits into and unlocks every obscurity and intricacy investing the mysterious phenomena, developed in an attack of this fell malady: "The affection is an assemblage of symptoms, the result apparently of an impression on the nervous centres." * * * * "These observations," resumes the learned Doctor, after detailing the most striking features of the disease, "these facts, and a number of others of like character, should prove conclusively, first, that the chemical composition of the blood itself is influenced in a most wonderful manner by the vital action of the nervous system; secondly, this action alone is sufficient to account, in a great number of cases, for an altered and broken down condition of the blood, without having to account for it by the theory of ferments present in the blood in the shape of poisons acting directly on its chemical composition, instead of indirectly through the nervous system." * * * * "We know the nervous system has a vital action over the chemical composition of the blood." * * * "If nervous influence will occasion different products, as secretions from the same kind of blood, it is not difficult to conceive that the nervous action can alter and modify the blood itself, and that an altered condition of the blood may not only be found when the death has

occurred from the instantaneous destruction of the life of the nervous system, but may exist to the detriment and distress of all the vital functions from a dynamic impression of the nervous system, which, however, has not been immediate, but only the remote cause, should death not ensue immediately from this impression." Dr. B. M. Cromwell, of Albany, Georgia, puts us in possession of his opinion: "Now, as to the pathology of hæmaturic fever, I regard the disease," says he, "as a blood poison, produced by the imbibition of an inordinate dose of malaria." * * * * "From many years' observation of malarial disease, I am convinced the blood primarily suffers in all malarial poisoning, and it suffers by reason of its disks—its oxygen carriers." Dr. J. H. Sears, of this city, sets forth in some unpublished views, which he has kindly submitted to inspection, the following pathological interpretation of the situation: "The primary influence of the poison is on the lymphatic glands, particularly the spleen, the chief of supply to the blood of white corpuscles. The miasm excites a peculiarly stimulating or irritating effect upon this organ, increasing its size and heightening its function, thus producing a larger number of white corpuscles than necessary to a normal condition of the blood, destroying the balance between the white and red corpuscles. Impressed with the circumstances under which they were generated, these corpuscles fail to fulfill their proper office, seem more independent, are not disposed of as originally intended, are diverted in their normal career, and may become merely melanæmic. They increase, *pari passu*, with the stimulus supplied; the red the while decreasing, until, instead of the normal proportion, 1 to 300 or 400 of the white, they are about equal. The source of the red blood declining, a larger number of shriveled, wrinkled, contracted bodies are seen floating in the circulation in a malaric or moulting condition, ready to be cast off as excrementitious matter. This condition, existing a longer or shorter time, according to the nature of each case, there appear melanæmic bodies in the white corpuscles, an abortive effort of nature, probably, to supply the red corpuscles. These bodies are constant in malarial fevers of serious import. When this dyscrasied condition of the blood has existed for any considerable length of time, the result most generally is a chill, by which the vital action is lowered and the action of the heart increased, but correspondingly diminished in force. There ensues spasm or contraction of the superficial capillaries, which forces a large number of these adhesive white corpuscles, melanic and melanæmic bodies, into the viscera, and upon the mucous surfaces. Thus the minute capillaries of the brain, liver, spleen and kidneys become clogged and their circulation arrested. Thus the functions of these organs are interrupted, predisposing to hemorrhage, especially in the kidneys and the mucous surfaces of the stomach and bowels. When reaction returns, the superficial capillaries are relaxed, and these corpuscles and other bodies force themselves into them, causing so much distention as to result in an exudation of serum stained with hæmatoidine from the debris of the corpuscles and melanic bodies, producing discoloration of the skin, or icterode appearance."

These interpretations of the pathological conditions existing in this grave trouble, it is hardly necessary to state, illustrate respectively the humoralistic views. It were not difficult to construct a theory just as plausible, and as much in accordance with the facts observed from the standpoint of those who hold, to employ the language of their great chief, Rudolf Virchow, of Berlin, "that the cell is really the ultimate morphological element in which there is any manifestation of life, and that we must not transfer the seat of real action to any point beyond the cell."

Of these theories all, some fall short of, some approach nearer to the truth. Some

exhibit a more superficial, some a profounder understanding of the mechanism of life. But all are struggling toward the light, each one a nisus in the right direction; all may serve as beacons and guides to more enlightened views as light increases, nuclei in the meantime, around which observation may gather her facts for future reference.

A simple observation, additional: whether the blood or nerve-centres, whole nervous mechanism, ganglionic system, or cell action, receive the primary morbific impression, one fact seems sufficiently clear: the nerve force falls so low, so much beneath the normal standard, whether in consequence of the influence exerted upon innervation by malarial intoxication directly, or indirectly through the blood, from changes impressed on it, thereby causing a lesion of nutrition and secretion, necessary to the functional activity of the several tissue systems and apparatus of the economy. To repeat: the nerve force falls so low, its action becomes so enfeebled, it loses the directing, controlling, conserving influence over the economy, normally belonging to it. Hence it is not unreasonable to conclude that in addition to active sources of destructive change in the vital fluids, the elective affinities normally existing between the elementary constituents of the blood, and which in health are presided over and directed to the conservation of organic life by nerve force, are left to riot in all the licentiousness of their chemical tendencies. Who, in this event, may conjecture the result of the organism? In the supposition itself, there would seem no inherent improbability; certainly none in the phenomena observed. It were much to be deprecated that in the treatment of this, at the best, fatal affection, there is so little consensus of opinion or uniformity of practice. Of malarial origin, and attended with what he conceives to be great biliary derangement, one practitioner insists upon the exhibition of mercurials, even to the extent of obtaining their constitutional effects, while another reads in the spanæmic condition unmistakable contra-indications to their use, deprecates them as defibrinizers and spoliatives, and will have it that so far as the liver is concerned, its only effect upon that important viscus is to *diminish the secretion of bile;* while a third party confines all his hopes to the free use of opiates to quiet irritations, albeit so necessary to the preservation of the economy to prevent fatal toxæmia, already imminent. A miasmatic disease, endowed with periodicity, however masked, the only rational expectation of a cure, urges another, is in anti-periodics, and where shall we find anything like, anything second to the inevitable sulphate, in all the domain of therapy? "Hold!" cries an authority, quite as respectable, and claiming much experience in the treatment of the disease. Do you not see that the whole nervous mechanism is ajar already, and do you not know that it is but adding fuel to fire to give quinine under such circumstances, and besides, do you forget that the cases are not few in which your favorite salt has produced this identical disease? Iron, iron, insists an authority, as a hæmostatic; iron for the spanæmia to furnish this necessary constituent for the hæmatin in the red corpuscles, so indispensable to intro-oxygen, and for want of which, the animal heat, failing to be generated, is declining. By no means, returns his neighbor practitioner; it is as clear as the sun in mid-heaven, that your ferruginous preparations are of no worth; the stomach being in such condition that, however needed, they cannot be introduced into the blood. Moreover, your so much lauded muriatic tincture will only serve to irritate still more the stomach, and prevent, as incompatible with it, the exhibition of a remedy of more worth than all others besides. "My entire reliance," puts in a practitioner over yonder, "is upon the free use, internal and external, of turpentine." "It may do good," replies one

over here, "but, having never seen any indication for its use, I have not tried it." "Use acids freely, lemons, lime juice; they are grateful to the patient, and antidotal of malarial intoxication," confidently exclaims Dr. A. "Do no such thing; the idea is preposterous," impatiently retorts Dr. B.; "the stomach is full of them already; use anti-acids, alkalies." Bewildered by such, not diversity simply, but contrariety of opinion, the conscientious medical man, anxious to give his patients, suffering from this, as from all other diseases, the benefit of all that is known in the healing art, turns away in disgust. Possess your spirit in patience, friend. It is no worse in this than in other diseases. It only seems so, because a new disease, draped in obscurity; you are over anxious for certitude. Discard the expectation; it belongs not to our art. Specifics are but the dreams of distempered imaginations. Our bodies are too fearfully and wonderfully made, for any well-informed medical man, in the present condition of our science, to think twice of the possibility of specifics. The empiric, and he only, naming his disease, plies his specifics. An age of adventure, fertile in expedients, and daring in their application; an age of mental activity and intellectual independence; an age in which the "*Marcus dixit, ita est,*" paraphrased

> "Did Marcus say 'twas fact, then fact it is;
> No proof so valid as a word of his"—

has been left in the past—*has played out.* In medicine, as in every other department of human effort, in our times, men must act for themselves, *pro re nata.*

In regard to the treatment of hemorrhagic malarial fever, it will be found, it is believed, that there is a class of cases, and strange enough, this class is most numerous in the most intensely malarial districts, that will do well and recover under any or no treatment; while there is another class, most numerous in proportion to the whole number of cases, in those districts in which malarial fevers are not very prevalent, and in which this particular form of disease is rarest, that will die with any treatment. Thus much premised, it will not be expected any particular line of treatment should be indicated. There are few diseases in which it is less admissible. In this, as in so many other affections, the cry not seldom comes, lo! here is the way, walk ye in it. The cool "*nil admirari*" is as becoming the sensible physician, on such occasions, as it is philosophic in all the walks of life. No sensible physician is misled for a moment by these ignes fatui, whatever their vulgar glare. The true medical man, who has the root of the matter in him, will treat any and every case according to the great recognized fundamental principles that constitute the basis of the healing art. Not the "sea weed" of the Roman satirist is "viler" than any and every attempt to prescribe a fixed line of treatment for a given disease. Ice, acidulated drinks, effervescing mixtures, small doses of calomel and morphine, the latter especially, where there exists much centric nervous irritation, to quiet the stomach; sponging with cold water, the cold douche, followed by free use of turpentine and other stimulating liniments and epithems to restore equilibrium of circulation. Such quieting remedies, or measures, as may seem most eligible in each particular case, for no two require precisely the same, to quiet extreme restlessness and jactitation. Such treatment, addressed to the primæ viæ, as special indications may point out, and finally, in those cases in which there exist well marked periodicity, the timely and unsparing exhibition of the sulphate of quinine, constitute a brief outline of a treatment which, it is believed, will be found to commend itself to the recognition of the well-informed physician.

Various multiplied numbers of other agents might be mentioned as useful in fulfilling these indications. Further specification is not deemed called for. It would seem that if the conjectures—for they amount to little more—of some who have given much to the investigation of this disease, be true, that that portion of the nervous system whose office it is more especially to supply innervation to the various processes of organic life is more immediately involved, the liberal exhibition of belladonna by mouth, or where that mode of using it is not practicable, the subcutaneous being employed, using the sulphate of atropia instead of the cruder preparations, ought to be the service. Submitted to the test—*nullum ego cognosco remedium nisi quod tempestivo usu fiat tale*—this agent, whether from mistaken pathological indication, or short-coming, in therapeutical efficiency of drug, has not met expectation. A word—its importance demands it—of the sulphate of quinine in this disease. It is not at all difficult to understand why those do so commend it as *the remedium principale* in all cases. Of miasmatic origin, as all admit, manifesting in most cases well pronounced indications of periodicity, this agent, *facile princeps* of anti-periodics, would seem to be especially indicated, called for by the nature of the disease and gravity of the symptoms. That in by far the greater number of cases it will accomplish all that is within human competence in an anti-periodic direction, is not questioned, but that there is a class of cases to which it is not adapted, that there are cases of which it is the immediate and exciting cause, is an opinion that has become too fixed in the minds of a portion of the profession, is too well established in fact to be dislodged by ridicule, or pushed aside by the cry of authority. That it has supervened upon the exhibition of a single dose of this salt, in which it was not previously threatened, under circumstances precluding the possibility of mistake, and this repeatedly, is a fact too well attested in this community to admit of question. Now, in these cases, admitting them such, can it be supposed that its action can be other than deleterious? If so, upon what principle? *Similia similibus curantur.* The principle—well enough, perhaps, for a disciple of Hahnemann—is not admitted here. "But quinine is antidotal of malaria." It is denied that quinine has any such property in any true sense of the word, in any such sense as the sesquioxide of iron, is antidotal of arsenious acid. "If not antidotal, how does it cure malarial diseases?" It is possible there may exist some misapprehension in regard to the action of this familiar agent. It is not uncommon to hear it spoken of as an arterial stimulant and sedative as well, in the same breath.

We have grown familiar with the expression *sedative doses* of quinine. If an arterial stimulant, it is a very singular one, one wholly *sui generis.* That there are certain conditions in which it acts as an arterial stimulant is true, but not more so than that in certain others it has no such effect. And that under certain other conditions it acts as a nervous excitant, is not more true than that under others its action upon the nervous system is powerfully depressant. It is concluded, therefore, that its remedial effects are in virtue of neither its stimulating nor sedative properties. How does it cure the chill? As an anti-periodic. There are remedies for these affections which, it is believed, act differently; arsenious acid and the hyposulphite of soda, *e. g.*, the former by its tonic, the latter, probably, by its anti-zymotic property. By an anti-periodic, in this connection, is meant, not simply a medicinal agent preventing the recurrence of a paroxysm, but one doing so by virtue of equalizing the circulation, preventing the recession of the blood from the superficial capillaries and its accumulation within the viscera, effecting this result by its power of distributing,

so to speak, innervation normally through the system. This is believed to be precisely the *modus operandi* of the sulphate of quinine. It is believed, further, that there are conditions of the human body in which such action is not only not remedial, but positively mischievous. Some such explanation as the following may serve to place the matter in its proper light: Innervation is directed to such parts of the body as the wants of the same may require, for some special purpose or exigency; *e. g.*, to the stomach, after the ingestion of the food; to the uterus, to sustain the orgasm necessary to parturition. Now, in the absence of any other explanation of the fact that the sulphate of quinine does bring on, is occasionally the exciting cause of, hemorrhagic malarial fever, this hypothetical one is given: From some part or parts of the economy already belabored by the enemy (malaria), and upon which an extra amount of innervation has been determined, to assist it in its efforts to sustain itself, the quinine, by its equalizing properties, diverts such extra nerve force, depriving such part or parts of the means of support that nature has provided, and in this manner the way is open for an accession of the disease.

If this explanation, or anything like it, be true, may there not be conditions of the system in attacks of this disease in which this agent, so valuable in almost all cases of malarial trouble, will aggravate the symptoms? There are those who feel assured that such is the fact. It may be for some such action as that just supposed; it may be that it interferes in some other way with innervation, or possibly it is detrimental in some other way. It is but stating the truth to admit that in those cases in which the quinine aggravates the symptoms, most of them at least, nothing seems to do much good; it is just those cases which show least indication of periodicity, those cases that generally prove fatal under any treatment. As a suitable conclusion for this paper, which has already greatly transcended the limits contemplated, a few thoughts on the prognosis of this dreaded disease are submitted. For those cases in which the apyrexia and recurrence of the paroxysm are most decidedly pronounced, and during the former the urine clears up and shows a tendency to do so, and in which quinine is well tolerated, causing little derangement of innervation, a favorable termination may be confidently expected. On the other hand, in those cases in which pyrexial flashes and rigors alternate at short intervals, in which there is great nervous derangement, in which the discoloration deepens, surface becomes mottled and the temperature declines, stasis of superficial capillary circulation, pulse becoming more gaseous, early coming on of suppression, accompanied by symptoms of uræmic poisoning, there is little to hope from the resources of our art.

There seems to be great difference in the fatality of the disease in different sections of the country. In portions of Alabama, in the years 1867–8, the larger portion of the attacked died. The accounts from some districts even state that not a case escaped. The mortality ranges, as given by different authorities, from twenty-five to fifty per cent. In some localities it would seem to amount to little more than any other form of intermittent fever. Some practitioners are reported as stating that they have treated many without ever having lost a case. Their statements true, they have certainly met with a very different class of cases from those occurring in this part of the country.*

*In McLennan county the per cent. of mortality is believed to be from twenty-five to thirty-five of the whole number attacked.

ICTERUS JAUNDICE.

There are three varieties of this disease.

1. *Icterus Chronicus.*—Yellowness of the skin without fever; urine yellow-colored, staining clothes, shirt, and sheets; giving a yellow-ochre cast to the urine; the eyes and urine showing yellowness before the skin begins to turn yellow; skin dry and rough; patient weak and languid, but not enough to compel him to go to bed. Usually caused by close confinement and hard study, or mental anxiety and fear.

2. *Icterus Acutus.*—This comes on suddenly, and usually with fever or bilious colic, produced by hepatitis, or biliousness as it is usually called in the South. Cause—obstruction of the flow of bile from the gall bladder, or obstruction of the cystic or ductus communis choledicus by spasm or choking up by gall stones; I have seen it in one case with thirty-two gall stones in the bladder, and the cystic duct completely atresied—closed up—by adhesive inflammation.

3. *Icterus Hemorrhagicus.*—Jaundice with purpura. Cause—a broken down constitution, and, like hæmaturia miasmatica, a long residence in a malarial district where the burden of the malaria falls on the liver and spleen instead of the kidneys.

I have had all three varieties myself, and do not think I can better illustrate what I would say than by giving a history of my own attacks.

ICTERUS CHRONICUS—CHRONIC JAUNDICE.

In 1844 I commenced the regular study of medicine in Raleigh, Tennessee. For two years I had been teaching school three miles from Raleigh, between Wolf and Lucehatchie rivers, and had chills occasionally during the whole time. I noticed my urine was very yellow and stained my shirt, but did not see any difference in the color of my skin; some one remarked to me that my eyes were very yellow, and that I must have jaundice. I had, then, never seen a case of jaundice. This yellowness increased until I was as yellow as gold, but still I did not go to bed, and was not sick at my stomach. Felt hot and dry, and made a great deal of urine of a very yellow color. My brother treated me, and I was well in three weeks. Seventeen cases occurred that fall, in Raleigh and around the country, and three cases died.

ICTERUS ACUTUS—ACUTE JAUNDICE.

I have mentioned my having this after my getting well of yellow fever, by going out in a shower of rain. I only had a slight fever; before my skin became yellow my urine was very yellow, as well as the adnatæ of my eyes. Soon my skin became a dark yellow, and continued so for nearly two months, though I never went to bed, and took everything that any and everybody recommended, but nothing did me any good. I obtained a furlough, and returned to Columbia, in the Brazos bottom, where

I rode a great deal on horseback, and recovered. This attack was brought on by checking the perspiration from yellow fever, by a shower of rain, and went off with a yellow fever perspiration.

ICTERUS HEMORRHAGICUS—HEMORRHAGIC JAUNDICE.

I became gradually yellow in December, 1870, but was able to be up and about. I had had, for two years previous, fever and several severe attacks of bilious cholic, relieving myself by taking chloroform in teaspoonful doses, or by inhalation, with quinine and calomel to break the fever. While under the influence of jaundice, I was called to see a surgical case at Houston, and after I had operated on the case, feeling much fatigued, I rode out to the fair grounds and was caught in a slight sprinkle of rain. On my return I felt chilly and had a hard ague that night; vomited all night; was very sick; left my patient (though I had high fever and was still sick at my stomach) and went home on the cars. My fever cooled in seven or eight days; was partially delirious. Prof. Rankin, who attended me, said I had hæmaturia for two days. I got better and continued my lectures in the college, but my skin continued yellow. I was up and down until the last of April, when I had another high fever, with pain in my gall-bladder and neuralgia in my head, which was dreadful. I took chloroform almost continually, to relieve the pain. At last I dreamed it was my teeth, and sent for a dentist and had seven taken out. I began to improve, and as soon as I could sit up, I started to Philadelphia and attended the American Medical Association meetings. Staid in Philadelphia two months; took prescriptions from every one that would prescribe for me.

I went to New York on the 4th of July, and staid there a month. One day I had a hard shaking ague, shaking even the bed at Metropolitan Hotel. I took calomel and quinine, twelve grains, in six pills, one every two hours, for two days, and was up again and about, and could walk around, but no change in my urine or skin, both were still very yellow. I returned to Philadelphia, was always constipated, and took seidlitz powders, citrate of magnesia, Kissingen water, and many other things, but all did no good. My landlady at Philadelphia said she would cure me. She had some pills that cured her son when he came home from the army in Virginia. He was as bad as I was, and many doctors had worked with him and had not cured him. She gave me three of Bragg's pills. I took one dose before I left Philadelphia, and another in Washington, D. C., where I stopped. These purged me and I had the diarrhœa for two whole years afterward. At times I would take a pound of chloroform in a night, to stop the pain in my liver and to check the diarrhœa. The chloroform always relieved me, and I would be able to go out and walk around. I stopped one week at my brother's, in Albemarle county, Virginia, and when I left I rode twelve miles on horseback to Charlottseville to take the cars for home. That night I had a chill and was very sick. I did not stop, but got a sleeping car at Lynchburg, to Montgomery, Alabama. They wanted several times to put me off, but I would not let them, until finally they changed the cars at Montgomery. Then I had to take a regular car, and that day I had another chill, and was forced to lay down on the floor of the car until my fever left. I took quinine, rested a day, and finally arrived home at Galveston, as yellow as I left. As soon as I got home I commenced to blister over my liver and stomach, putting one on after another, as they healed up, until I got so sore I could not bear them. I could walk around all the time when I did not have the fever. I had a good appetite all the time, and could eat anything. It did not affect my stomach, but my stools were

white, like milk, and much too frequent. The blisters helped me. Finally I started up to Dallas county, stopping at Houston a week. While there I had cramp colic. My friend, Dr. Hudspeth, roomed with me. I took a bottle of chloroform that night, and he was alarmed, and thought I would kill myself; the next day I went up to Mexia, and stayed with Dr. Rankin. He gave me some pills, but the water was limestone and affected my bowels so, I was afraid to remain there, but I got better and went to Corsicana, and stayed with Dr. Watkins. He persuaded me to quit medicines altogether, and I took his advice. I went on to Dallas. There my diarrhœa was so bad I got a bottle of gin and took it, but it did me no good, so I got on the stage and went to Bonham, where I rode around with Dr. Dorset and considerably improved; from there I went to McKinney and to Lebanon, where I stayed for nearly two weeks, with Dr. Shelburn; one night I had a severe attack of colic and took a bottle of chloroform. From there I went to Sherman and Denison, then in the woods, and over into the Indian nation, where I ate smoked beef (jerked beef), and turnip greens; these stopped my diarrhœa. There was a spring on the road from Sherman to Denison that was chalybeate, and when I partook of it I felt better. I stayed up there until the 28th of November, the thermometer being down to 19°. I went home very much improved, and commenced my course of lectures. In six weeks I was as bad as ever, and had another dreadful attack, being as yellow as before. I was carried to Austin, nearly dead, but the day after I got there I was able to walk, and my jaundice had nearly left me. I stayed in Austin two months, and returned well, as I thought.

Returned to Austin in April, remained until some time in June; returned and had fine health that summer and winter, with the exception of my spell at Calvert, while I was attending yellow fever. My wife had dengue while I was at Calvert, but I did not have it this year, as I had had it in 1863. Next spring I was still subject to spells of diarrhœa. I remained better and worse until March 1874, when I had a diarrhœa, and neuralgia, from toothache. I took a dose of morphia and went to bed with fever; with a terrible pain in my head. I had been having toothache before I took the diarrhœa, but paid no attention to it. I had such severe pain in my head that I called for chloroform and took it for seven days; every time I waked up my head would ache, and I would take the chloroform; all the doctors that my wife sent for failed to relieve me. At last she put a large blister over my stomach, six by six, and when it drew it brought me to my senses, for I had not recollected anything for six days, and had taken and wasted eight pounds of chloroform. When I came to I told the doctors I had had a chill and the neuralgia passed from my liver to my head, and if they would give me quinine and calomel I would get well; they did give me the old prescription, twelve and twelve grains, in six pills, one every two hours. That evening Dr. Bibb and J. T. & W. Brady carried me to Houston, to Mr. Brady's; when I got there I was able to walk, but very yellow. My finger and toe nails were soft, from the chloroform, and I could belch it up. I took a warm bath, which helped me very much. That night the neuralgia returned, and instead of giving me chloroform, they gave me brandy, which made me furious, and my sufferings worse, until they were compelled to give me chloroform. I told Dr. Bibb it started in my teeth, as it did before I went to Philadelphia, and one night I dreamed it was my teeth and sent and had seven pulled out, and I got better; so the next morning I had all my upper teeth taken out, but one root was broken off. It pained me so that after dinner I went to Dr. Fielding's and had it taken out. My neuralgia did not return, and we went to Dallas that night, on the

cars. I lay all night with my head in the window, and the cool breeze kept me from fever.

At Dallas I thought I would go out to the wash-room and bathe my head, but was pushed down by a ruffian and came near going into spasms. However, I got to the hotel, and took some brandy, fell asleep and continued to improve. My gums were very sore, and the yellowness of my skin continued for nearly a month. While suffering from my gums I began to smoke tobacco, and have used it ever since, but never before in any way. I was always temperate, never drank liquors, unless for medicine, and was never drunk. I went from Dallas to Denison, and stayed at both places two months, and completely recovered. I went home and stayed six weeks; had a slight fever and became afraid I would be taken down again. I went to Austin, stayed there a week, but the water, being limestone, started my bowels, so I went from there to Lampasas Sulphur Springs, where I stayed two weeks, but the water was limestone, and though I would not drink it, even the coffee I drank made me have diarrhœa. I was sent for to go up to San Saba county, and from there I rode around in McCulloch, Llano, and Mason counties, among the raids of the wild Indians. I improved all the time, but on my return I was taken very sick at Mr. Moses', where I had stopped all night, and my colic returned, but I stopped it with brandy, and rode to Liberty Hill, where I stayed a week and improved. I stopped a week in Austin, reaching Galveston about the 10th of November. From this time on I had no more symptoms of jaundice, but every change of weather would give me diarrhœa, which I found I could check with peach brandy, and I would get well without anything else, or without turning yellow. I had no more spells until April 1st, 1876, but was able to practice and had become very fat, weighing 196 pounds.

In April, I went to Marshall, to attend the meeting of the State Medical Association, and while in Marshall I became badly constipated. They used mostly well water and spring water which was chalybeate; this, no doubt, caused my bowels to become constipated. After the Association adjourned, I went out with Dr. Orman Knox to Jonesville. He studied medicine with my brother before I did, and I had not seen him in thirty years; while there, I went out with him every day. It being a malarial district, and there having been heavy rains, my constipation got worse. I took some salts and other remedies, but they did me no good. I was compelled to go to Marshall, and went there feeling very bad; while there, I was taken very bad with fever, became delirious, took some chloroform and other medicines Dr. Thomas prescribed for me, and my fever broke. I went away on the second morning to Jonesville, and went out with Dr. Knox, to see one of our patients; had to use a great deal of chloroform; it made me very sick, and when we got back to the doctor's I had fever; I told him to make me up some calomel and blue mass pills, and while he was fixing it, I took some chloroform on my handkerchief and fell asleep. I did not recollect anything until Sunday (this was Tuesday evening); when I woke up I was vomiting terribly, my head ached to bursting, and I begged the nurse to let me have some chloroform. They had refused to give it to me, and I had become conscious, but I begged so hard, the nurse left me to beg some for me, but while he was gone, I opened the window, jumped out, and ran as if for my life, to a puddle of water in the field, and laid down in it, I was so hot. They brought me back, but as soon as I was in bed I became unconscious, and did not recollect anything until the next Wednesday. When I became again conscious, and vomiting terribly, I was yellow, almost livid. They would not give me any more chloroform, and I continued to suffer; I

would get so hot, I thought I would die; I belched up the chloroform for a week; my finger and toe nails became soft, as before; my mouth and throat very sore; the water brash was terrible; saliva poured from me. I believe chloroform produced it, as I had it every time after I had used it to excess. I had taken (Dr. Knox says) five pounds, and that he gave it to me until it would not produce sleep. He said I talked to him perfectly rational, and said I would die if he did not give it to me; called him cruel and unkind; knowing my reputation and general good habits, he humored me until he sent for my wife, who knew its effects on me; when I was so bad in Galveston, she said I prescribed for patients I did not recollect ever seeing; and Dr. Knox says I prescribed for a patient that I had completely forgotten until he came to see me after I had gotten well. The chloroform produced the effect of mania-a-potu on me, for I could see and imagine anything; saw plainly my first wife; saw Dr. Knox's father, and many other strange things, and although I was awake all night, I could see them at any time during the night. After I quit vomiting the water brash was terrible on me, yet I had a good appetite, and recovered from my jaundice in a few days. My finger and toe nails became soft, as they had done on the former occasions. I was dreadfully blistered, and even after I got up and rode around, I had to go to bed for a week, as the blistered surfaces threatened to mortify. They are still sore, and itch and burn, but they no doubt saved my life each time. Nothing I took did me any good but blisters. Chloroform always eased me, and I believe, until the last spell, it did me good, and allowed the gall-stones to pass off, and I would get easy. Mercury always made me more yellow; seemed to excite the liver to action and the secretions could not pass off, except through the kidneys and skin. But I was compelled to take it to break my fever, as quinine alone made me worse and increased my fever.

In these three attacks I took everything that was ever recommended for jaundice. Blisters cured me, or always did me good. Sulphuric ether is said to dissolve gall-stones, but it was always so sickening to me I did not give it a fair trial. I have not tried the choleate of soda. I hope all is true that is said of it.

I will remark, before closing, I always administer chloroform on a towel or pocket handkerchief, and never allow it nearer than half an inch to an inch from the mouth or nose, and in the horizontal position. I have never had a fatal result. I once took some internally, pouring it into a tumbler by moonlight, which came near killing me. I was unconscious from 11 P. M. to 7 A. M.

ANATOMY, PATHOLOGY, AND TREATMENT OF THE SPLEEN.

Anatomy of the Spleen.—The spleen is a ductless gland, situated and lying in the left hypochondriac region. It is an oblong, flattened body, of dark bluish red color, about five inches in length, and weighs about six ounces in its natural and unexcited state; but varies a good deal in size during digestion, even in perfect health. It is spongy and vascular in texture. The external surface is convex, the internal slightly concave. It is indented along its middle line and pierced by numerous vessels, which form what is called its *hilum liens*, being irregular openings to admit its large vessels. Its posterior aspect is obtuse, its anterior sharp and notched. The upper extremity is larger than the lower, and somewhat round; the inferior is flattened. By its external or convex surface it is in relation with the diaphragm, which lies over it and separates it from the ninth, tenth and eleventh ribs; by its concave surface with the greater end of the stomach, the external extremity of the pancreas, the gastro-splenic omentum and its vessels, the left kidney and supra-renal capsule, and the left crus of the diaphragm; by its upper end with the diaphragm, and sometimes touching the left lobe of the liver, and by its lower end with the transverse arch of the colon on its left extremity. It is connected with the stomach by the gastro-splenic omentum, and to the diaphragm by a fold of peritoneum, called the *suspensory ligament.*

It is said by Gross and others, that there have been found from one to eight or ten small spleens, about the size of a hazelnut, and from that to a walnut, connected with the spleen proper by the splenic artery, to which they are directly attached. They are called by anatomists *liens succenturiati.* They are generally found near the greater end of the stomach. I have never seen any of these bodies.

The spleen is invested by the peritoneum and an elastic membrane peculiar to itself, which enables it to yield to greater or less extension by its blood vessels. This elastic tissue forms sheaths for all its vessels, in their various ramifications. From these sheaths small fibrous bands are given off in all directions. These fibrous bands, called trabeculæ, by their connections form its areolar tissue. That portion included by these sheaths is soft, granular, of a bright red color, and interspersed with malpighian bodies, small white bodies or corpuscles. These corpuscles are believed to be aggregations of cytoblasts, inclosed in a kind of capsule of capillary vessels. Separate cytoblasts are abundantly scattered through the red substance.

The spleen receives its blood from the cœlic axis by the splenic artery, which is of very large size in proportion to the spleen. The branches of the splenic artery are distributed to different sections of the spleen, and anastomose very sparingly with each other. The veins are very large, and by their various ramifications compose its principal bulk. The ramifications pour their contents into the splenic vein, and

help to form the *great portal vein*, which finally passes through the liver. The lymphatics are numerous and of a large size; they terminate in the lumbar glands. The nerves are the splenic plexus, derived from the solar plexus.

Physiology of the Spleen.—The physiology of the spleen is not well understood, but from late investigations we begin to have more definite ideas of its uses and office in the human economy.

Like the other ductless glands, it does not seem to be essential to life. It may be removed or become perfectly atrophied, without the patient's suffering material inconvenience. But in all such cases the lymphatics are much enlarged, and seem to perform its office in the economy of nature.

It is now known that the spleen does modify the blood that passes through it, but how the gland acts to produce this modification seems to be a matter of doubt. I believe the blood receives and parts with some of its principles, as it does in its passage through the lungs; for we know that the red corpuscles are diminished, and that worn out corpuscles are disintegrated, and in the colored portion of the spleen pulp corpuscles are found in various stages of degeneration, and these corpuscles help to give it its dark color.

Kirke says, in his "Physiology," that "the large size the organ obtains toward the termination of the digestive process, and the increase in the fine granular albuminous plasma within its parenchyma, and the decrease of these materials, appear to show us that the gland is concerned in elaborating the albuminous or formative material, and for a time storing them up to be gradually introduced into the blood according to the demands of the system." He also observes, that owing to the small amount of fatty matter, it is not supposed that it aids in the preparation of materials for the respiratory process. But it is quite probable that it, like the lymphatics, assists in forming germs of subsequent blood corpuscles, as there is a large amount of white corpuscles found in the splenic vein.

Beside these, its supposed functions, it acts, no doubt, as *a diverticulum to the portal circulation.* It is used to contain portal blood (after digestion) with nutritive quality received from the food, and it gradually returns to the liver, where it is further acted on before it passes to the lungs, etc. This is also made probable by its enlarging in affections of the liver and heart, tending to impede its passage through them, and by its decreasing when the portal circulation is depleted by discharges from the bowels and from the effusion of blood into the stomach.

Pathology of the Spleen.—The diseases and morbid anatomy of the spleen are better understood than its physiology. It is subject to all the various analogous and heterologous formations to which other parts of the body are liable. Inflammation, acute and chronic, abscesses, gangrene, hypertrophy, atrophy, softening, suppuration, etc. In its hypertrophied state, it is also liable to be *dislocated* or *lacerated.* It is subjected to *induration* and *hepatization*, or sometimes to become *fibro-cartilaginous.* It is liable to atrophy, even to entire destruction. Of all the *analogous* formations, the spleen is most subject to hydatids in its substance or on its capsule. It is also subject to fatty tumors and calcareous deposits, sometimes in small bodies like pin heads, one case of which I have seen accompanied with miliary tubercles in the lungs, which they much resemble, if they were not identical.

Serious cysts are found in and on the body of the spleen. These cysts are sometimes filled with melicerous, atheromatous, steatomatous substances.

There is no pathognomonic sign or symptom of these affections. The spleen is always more or less enlarged in these cases, but they cannot, during life, be dis-

tinguished from hypertrophy as a consequence of *fever*. Hydatids sometimes become very large and burst into the abdomen, and cause death from peritoneal inflammation.

Of the *heterologous* formations, tubercles are the most common, and will be most generally found where there are tubercles in the lungs or mesentery. An interesting kind I saw in a subject I assisted to dissect at the Louisville University. In this case the mesentery was completely studded with tubercles, so much so that Dr. Bayless kept the specimen, and it is now in the museum of that college. Melanosis is a rare disease of this organ, but all kinds of cancers are said to occasionally occur in it. None of these affections can be recognized during life. They may be inferred to some extent from the cachectic state of the system, and from being known to be present in other parts of the body.

Metastatic abscesses of the spleen, from wounds and surgical operations, are said to be common, but not so often as in the lungs, liver, or brain.

Much the most common affection of the spleen is an acute inflammation of its parenchyma as an accompaniment or sequel to *fever*, dysenteries and diarrhœa. Acute inflammation of the spleen, if not promptly and judiciously treated, will most generally terminate in chronic inflammatory fibro-cartilaginous induration, suppuration, gangrene or apoplexy. Inflammation of the spleen is a common affection where I have practiced. In the Mississippi and Brazos bottoms scarcely any one lives from three to five years without having been subject to this affection. I presume I have seen as much of this disease as any man of my professional age, and can speak positively on this subject. For the last twenty years I have lived either on the bank of the Mississippi or Brazos, or near their immediate valleys. Fourteen years on the Mississippi and six on the Brazos; twelve years in active practice, and eight years under my brother, then in full practice at Raleigh, Tennessee. Inflammation of the spleen, as I said before, is common to every one living three or five years in these bottoms. Whites and mulattoes are much more liable to it than pure blacks. In blacks I have never seen a case of enlargement of the spleen except as a complication of typhoid, or rather as a concomitant of typhoid fever. Griffs are not as liable to it as mulattoes, nor mulattoes as whites. Blacks are partially exempt from intermittent fever, but are equally, I believe, liable to inflammation of the liver and remittent fever. As to affections of the liver, I have not noted any difference in persons of different colors; nor have I discovered any difference as it respects typhoid fever. I have thought, as a general thing, that blacks are more liable to typhoid fever than mulattoes or whites, but I attributed this to their want of cleanliness, which is observable to any one who is familiar with large negro plantations. I have found the spleen partially enlarged and rather indurated in all cases of typhoid fever which I have examined after death, even in a child two years old.

Acute inflammation, as I said before, is liable to terminate in chronic, and from chronic inflammation we have hypertrophy as a most usual result, and from enlargement we have dropsy, a general anæmic state of the system, and an impoverished state of the blood.

If the active inflammation is not subdued or modified by treatment, the spleen will soften, suppurate, or terminate in gangrene. If the inflammation alone is attended to, and the patient is not treated for the primary cause, say malarial or typhoid fever, the spleen will become gradually enlarged, and often attains an enormous size; many hundred of such cases have come under my observation.

Hypertrophy may come on gradually and even imperceptibly, but may be easily

detected by pressure over the region of the spleen. There is always more or less tenderness on pressure, with flatness on percussion, even before the spleen can be felt. After it becomes large its outlines are easily traced, and from the small size we have described it in health, it enlarges until it covers the anterior cavity of the abdomen, even feeling as if the whole cavity were filled with a solid body. It now causes a protrusion of the abdomen similar to that of a pregnant woman in the ninth month. That the spleen is enlarged may be told also by the general appearance of the countenance and skin. The skin is of a sallow-white color, and may be easily recognized by those familiar with the disease. It may, nine times out of ten, be told by the general appearance of the skin alone, without any tactic examination. In cases of enlarged spleen caused by malarial fever, I have not so generally found the liver implicated, as we are led to suppose from reading the books; it is often found in almost a healthy condition, sometimes, I may say often, secreting bile too freely. Where the liver is not implicated but acting, I have not found mercury necessary to a cure of the spleen, while in those cases where the liver is diseased also, mercury is almost, if not absolutely, necessary to perfect a cure. In intermittent and remittent paroxysms I have found a great tendency to *rigors*, if the spleen be enlarged, or enlarges during the paroxysm; but where the spleen was not enlarged, or did not enlarge during the paroxysm, the chill and fever generally came on together. Where the teeth are made to chatter, and there is a general shaking of the muscles, the spleen is always enlarged. This may be called a pathognomonic sign, for I do not remember a single exception. While the spleen is moderately enlarged, and before adhesions have taken place to the surrounding textures or organs, the spleen may be easily *dislocated*, several cases of which I have seen: the suspensory ligament is torn, and the spleen turns over, as it were, and falls forward on the colon and bladder, and here becomes fixed by adhesions, so that it cannot be replaced; yet it may be partially reduced, and the patient may live and even enjoy a moderate portion of health, but always have the sallow appearance which I have described. A case of this kind was in Brazoria county, in a lad of fourteen years.

Suppuration of the spleen is rare in proportion to the number of cases of enlargement. By some, as the late Prof. Drake, it is supposed never to occur below thirty-five degrees of latitude. This is undoubtedly an error, for I have seen three cases in my county, south of Galveston. W. M. Bradly had his spleen to suppurate in 1853, and it pointed through the abdominal wall below the ribs, and was punctured by my friend, the late Dr. F. M. Oatis, of Sandy Point, Texas. It discharged a large amount of dark grumous pus and blood. The orifice healed up; but he still has an indurated spleen of an enormous size, covering most of the abdominal wall. He is at times dropsical, and has a running ulcer on his leg, as a result of the cachectic state of his system. He is able to ride about, and otherwise enjoys good health.

Case 2.—Mrs. P., of Brazoria county, was taken with intermittent fever in the spring of 1858, and it continued to occur during the early part of the summer, until finally the spleen suppurated and discharged its contents into the stomach. She was treated by myself and Dr. Porter, of Columbia, with mercury, iodine, blisters, and quinine, or the citrate of quinine and iron, but nothing we could do would stop suppuration. There was a circumstance in Mrs. P.'s case worthy of further note: she was salivated with iodine used as an embrocation over the spleen, while there was no smell of mercury, or any ulceration of the gums. The saliva poured out of the mouth, until she thought she would suffocate from it. By discontinuing the use of the iodine the salivation soon subsided, though the mer-

cury was continued more or less for two weeks afterward, and without any symptoms of ptyalism. She suffered greatly from retchings and sick stomach. She finally recovered, but her spleen was still very much enlarged.

Case 3.—Mr. Henry, a carpenter of Columbia, had had chills for nearly two years, at irregular periods, and finally was taken so bad that he could not work. He paid a visit to the Gulf of Mexico, for the purpose of trying sea-bathing, and while there his chills got worse on him, and he was brought home on a bed. I was called to see him, and used the usual remedies with energy, but could make no change for the better. I broke up his fever and stopped his regular paroxysms, but still he did not improve. I blistered over his spleen, which was much enlarged, but could not reduce it. About the fifth day of my attendance he had a hard shake, and thought he was dying. His chill lasted about one hour and a half, and went off with a profuse sweat. It came on him when he had about twenty grains of quinine in his system, which, in most cases, is sufficient to stop a chill; seeing this, I immediately began to suspect suppuration, and I examined for a softening, but could not detect any. His liver was acting well; his stools were bilious; but I thought I could feel the liver lobulated, and it was tender on pressure. He had slight fever after his shake, with a hectic flush on his cheeks. These shakes continued at irregular periods for three days, in spite of all I could do, and he finally died delirious. There was no post-mortem, which I regret; but from all his symptoms, I thought there were several abscesses of small size. His symptoms resembled cases of suppuration of the mammary gland, etc.

Hiccough.—I have seen severe and continuous hiccough from an enlarged spleen. One case, I well remember, occurred to me while practicing in Panola county, Mississippi. I was treating a young man for intermittent fever, attended with vomiting and sick stomach. His spleen was enlarged. I gave him some pills composed of blue mass and rhubarb, and followed it with large doses of quinine—ten grains every two hours until three doses were taken before his chill time. This broke his fever and stopped his chills, and greatly reduced his spleen. But as the spleen contracted, he was taken with hiccough, and it was more distressing than his former situation. I gave him all the anti-spasmodics I could think of—morphine, camphor, assafœtida, valerian, and warm baths; applied mustard to the stomach, etc., yet in spite of all this, his hiccough continued, even during sleep, for eight days; at last, not knowing what to do, I salivated him, and as soon as the mercury took effect he began to improve, and with the salivation, he recovered entirely, and has never, as I know of, been subject to this symptom since. I thought, in that case, the spleen contracted adhesions to the diaphragm, and the medicines I gave him to cure his fever and ague had cured his spleen and torn up the adhesions, causing the diaphragm to take a convulsive action. The calomel subdued the inflammation of the spleen and diaphragm, and thereby cured the hiccough.

Gangrene of the spleen I have never seen. Softening is a frequent accompaniment of hypertrophy. Atrophy I have never seen, and think it very rare. Fibro-cartilaginous and indurated spleens are common. Where an enlarged spleen is reduced by medical treatment, it almost invariably is left indurated, and its coats become fibro-cartilaginous, and its trabeculæ are enlarged and thickened. The spleen sometimes seems to lose its function, and is not easily enlarged by fevers afterward. It is not an unusual occurrence for a boy, or child, or even for young men, to have enormously enlarged spleens, and on being sent out of the bottom lands to school, to recover entirely their health; on their return they are not subject to

malarial fevers, and especially are they exempt from enlarged spleens. But in these indurated cases the spleen is never found in its natural state or size as in healthy persons who have never suffered from enlargement. It never returns to its normal size, and can generally be felt in its place. The spleen in such persons is found after death to be fibro-cartilaginous. The spleen in its enlarged state is often ruptured or lacerated by external violence, by blows with the fist, falls from horses, etc. Several cases of death from such cases I have seen. A case of this kind is reported in the New Orleans *Medical and Surgical Journal*, by Dr. Chinn, of Brazoria, where an individual died from a blow over the spleen, in a fight. The homicide was tried for murder, but upon a post-mortem examination, made by Dr. Chinn, the spleen was found softened and easily lacerated, and upon a statement of these facts the man was acquitted. I also knew a young man to be thrown from his horse, and to die in a few days, from pain in the region of the spleen, caused, no doubt, by a laceration.

Therapeutics of the Spleen.—The means of subduing inflammation are as applicable to the spleen as any other organ, and should be resorted to immediately, as in all cases of inflammation. Where it is brought on with or by malarial fever, you must give in addition to mercury, quinine in large doses. Experience has taught us that the spleen can be reduced sooner by quinine in large doses given at once, than by small doses often repeated. Thirty grains given in three doses of ten grains each, are more efficient than thirty grains given in ten doses in twenty-four hours. If there be tenderness over the spleen after you have given an active dose of mercury and quinine in free doses, it is well to apply a blister, which will remove the tenderness and reduce the spleen, if enlarged.

In chronic inflammation of the spleen, with enlargement, I give but little mercury, and generally combined with taraxacum. Blue mass, often repeated, I have found injurious. It is too slow in its action, and creates an irritation of the stomach; but if it be combined with some active purgative, as rhubarb or taraxacum, it answers every purpose and does well. I usually give one of the following pills, but much prefer the first where there is fever:—

℞. (1) Calomel, grs.x
Taraxacum, grs.v
Rhubarb, grs.vj. M.
Sig.—Make into four pills: to be given at one dose.

℞. (2) Blue mass, grs.xx
Pulverized rhubarb, grs.vj. M.
Sig.—Make into four pills: to be given at one dose.

If there be no fever, divide this into two doses, and give two pills every four hours. If there be diarrhœa with fever, combine an opiate with the pills, morphia or opium; the latter is best. If these pills do not operate in ten hours, give a dose of castor oil; if they act too freely their action must be checked by opium; it is not well to let the bowels run off, as we say, in any case. After the action of these pills, or if the case be urgent, begin with the following pill: citrate of quinine and iron, thirty grains; extract of gentian or licorice, sufficient to make into mass; divide into six pills; of these, give one every hour until all be taken, beginning in time to get them all taken before the expected chill. If the patient is disposed to be dropsical, I combine also with this pill some tonic. Oil of black pepper is the best, half a drop to each pill. This should be repeated from day to day, until the enlargement of the

spleen cannot be felt, or until all signs of chills or fever are gone. The quinine and iron should be taken every cold or wet day, until all appearance of the disease is removed. There is a great tendency to relapse in these cases, which should be strictly guarded against. I have tried iodine in every form and every mode I could think of, but I cannot say it ever did any good when applied to enlarged tonsils; the functions of the absorbents, or rather the lymphatics, are destroyed by the enlarged spleen, and we must therefore endeavor to cure by endosmosis instead of by intestinal absorption; hence the great good which blisters do in this disease. Blisters should be small, and be often repeated. I have now abandoned the iodine treatment, and find I succeed much better without it. I never fail by blisters and citrate of quinine and iron. This preparation is the best of all the various compounds of quinine, in cases of enlarged spleen, or in anæmic conditions of the system. The bowels must, in all cases, be actively moved at least once a day, especially where there is a tendency to dropsy. In dropsical subjects, after giving the above pills, I often follow them with cream of tartar for several days or weeks. In cases of congestive fever, where the spleen is enlarged, there will be no serious congestion of the liver or brain, but great congestion of the stomach and in the mesentery is evinced by continual vomitings, retching and diarrhœa, even almost like cholera. There will be great pallor of the surface, and the skin will assume its peculiar shrunken appearance, called cutis anserina. These cases require stimulants of the most active kind—brandy, ammonia, sinapisms, with an opiate. But they will not bear much mercury without producing ptyalism, and it is not so necessary to a cure; but a moderate dose at first I have found generally necessary and beneficial. Our main reliance is upon quinine. It is in all cases a *sine qua non*. Where there is no enlargement of the spleen, the liver or brain is sure to be seriously affected, and then mercury is our *sheet anchor*, and it must not be spared until you overcome the congestion, or affect the system with it. In these cases I give also the *sulphate of quinine*, for that seems to be the most efficient in all cases where the liver or brain is affected.

The best time to reduce an enlarged spleen in the bottom lands is in the fall, after frost, and by continuing your treatment through winter you can perfect a cure; at any other time relapses are sure to come, unless the patient is very prudent, and often no prudence will avail. Then the patient must leave the bottom lands, or take medicine all the time until the habit is broken up, and the spleen becomes quiet as it were. I find irritation with croton oil and sweet oil, twenty drops of croton to the ounce of sweet oil, rubbed over the region of the spleen, or tartar emetic ointment, to answer a good purpose, where the patient is unwilling to blister. But I would never rely on iodine, as I said before, for I have found it inefficient. This seems strange, from its known and undoubted good effects in bronchocele and in enlargement of the lymphatic glands; but we must remember that the lymphatics are, as it were, destroyed, and therefore cannot act. The red globules must be increased, and also the fibrin, hence the good preparations of iron do in these cases. Unless the blood is enriched by iron, or some tonic, quinine will not stop a long-standing case of chills. It will always stop or check them for a while, but they will return. Port wine is an excellent tonic in these cases. Gin is even better where there is a tendency to dropsy. The Russian belt worn tightly around the body is good in all cases of enlarged spleen, whether it is from hydatids or fever, and where the spleen is dislocated, or the patient is dropsical. Any belt made of leather or cloth will answer, but the morocco belt made wide is the best. It should

be worn tight, and kept so until the spleen is reduced. I have often cured cases by the following pill, which will be more readily taken by your patient than almost any other combination :—

℞.	Sulphate of quinine,	grs.xx
	Citrate of quinine and iron,	ʒss
	Extract of gentian,	grs.x
	Hyoscyamus,	grs.xij.

Sig.—Make into twelve pills; give one every hour until six are taken.

This pill, with an additional dose of the calomel or blue-mass pill mentioned before, will cure any case of enlarged spleen or chills, if persevered in a sufficient length of time.

DIARRHŒA HÆMORRHAGICA.

(BLOODY FLUX.)

General History.—This disease is the great scourge of the Southern States. When I commenced the practice of medicine in Panola county, Miss., in 1847, this was the most fatal disease of the country. When I returned to Memphis, in 1852, I found it prevailing in the country around Memphis, both in Tennessee and Arkansas, and when I settled on the Brazos, in Brazoria county, I found it the scourge of the large plantations. It is common in Galveston, and the City Hospital is never free from it. It was the pest of our armies, and it is the most fatal disease that has occurred in the English armies in the East Indies. It prevails at all seasons of the year, and at all temperatures. It attacks young and old, rich and poor. It is often epidemic in different districts; sporadic cases are occasionally occurring.

It is *infectious when epidemic;* it is worse in malarial districts than in high and healthy districts. In wet and warm weather, than in dry and cold; in spring and autumn, than summer or winter.

Symptoms.—The name we have given it is its diagnostic symptom, a *bloody flow*—as Asiatic cholera is a rice-water flow (diarrhœa hydoryzea); the one is bloody, the the other seems like rice. In most instances the discharges are very painful, and attended with a cramping in the gastrocnemii muscles (calves of the legs), a blanching of the face, more or less sickness of the stomach. The discharges at first, perhaps for a day or two, will be nearly natural in appearance, but too frequent, and usually accompanied with mucus and attended with pain. The operations will become more frequent and more painful, with a large quantity of mucus, streaked with blood. These will increase until it will be nearly all blood, and perhaps every half hour, the patient feeling a disposition to stool all the time, and will not get off the stool-box or mug, unless pressed to do so by the nurse, or from want of strength to sit up any longer. Some cases are attended with high fever from the first, and others are free from fever during a week's or two weeks' attack. The skin is often bathed in a clammy sweat, which is very offensive, and hard to wash from the fingers

after feeling the pulse. Again, the skin will be hot and very dry, the tongue red and streaked, with sordes on the teeth, which indicate that the disease is typhoid. The tongue is usually coated with a whitish brown fur, with red edges. There is tenderness over the entire abdominal cavity. The anus is often prolapsed, especially in children. In adults it often produces hemorrhoids. This should be particularly noticed, for the blood may come from them, which can be relieved by a simple operation, and is not dangerous if neglected. In the first stages the appetite is gone; rather loathes food. When the disease is of some ten days' duration and without pain, patients have a voracious appetite, and will often kill themselves by eating, or by drinking wine, porter or ale. They usually have great thirst, but cold water will increase the cramps, and cause more frequent stools.

Pathology.—The bowels are in a state of inflammation in some part of their course. The stomach is not often inflamed in the first stages, but becomes so in a few days if the patient is not relieved; the duodenum is often inflamed, and the liver enlarged and congested. The spleen, in the Mississippi and Brazos bottoms, is most always hypertrophied.

The ilium and jejunum are also often the seat of the disease, and are liable to sloughs and to be much contracted. When these parts are involved there is less pain than when the stomach and duodenum are affected, and the discharges are more mixed with fecal matter and mucus than when the colon alone is involved. The stools are apt to be watery, and often grumous, and the case will more readily assume a typhous type. The glands of Brunner and Peyer are ulcerated or congested, and the mesentery is filled with dark blood. The colon is the principal seat of the disease, it being, in most cases, a colitis, an inflammation or congestion of the colon, most often of the sygmoid portion, next the ascending portion, then the rectum, and lastly the transverse. When the blood is nearly pure it comes from the rectum and the sygmoid section. The valvulæ coniventes are destroyed, the colon contracted to the size of your finger, and looks black when the abdomen is opened. The mucous coat is destroyed in patches, and there are hemorrhagic points. The mesentery is congested and black with blood; sometimes there is a gurgling in the right iliac fossa and an enlargement of the cæcum which can be distinctly seen and felt.

Causes.—In the districts where I have practiced the most frequent cause is malaria, and the attack comes on with a chill, as in intermittent fever. The liver is primarily involved, and the spleen enlarged; the stools at first being clayish and mucous. The liver tender and enlarged by congestion, urine high-colored and scant. Getting wet is, perhaps, the next most common cause; the use of limestone water, especially in persons accustomed to use freestone; also a change from limestone to freestone. Limestone water always produces it on me even when only used in coffee. Vicissitudes of temperature, unusual changes of c'othing, sleeping on the damp ground, or in damp rooms; getting the feet wet; drinking whisky, porter and ale, by those not accustomed to their use; eating shell fish or candies, especially in children; drinking ice water when very hot; taking cold baths, especially when there is no reaction; and lastly, but perhaps not least, the use, unnecessarily, of drastic purgatives, especially quack pills. One of the worst cases I ever treated was from the use of Moffitt's pills.

Treatment.—My first object in treating flux is to ease my patient, relieve him of his pain, for which purpose I use solid opium. I have found it better than any of the salts or tinctures. I give what I think will relieve the pain, say from one to five grains every three hours, or oftener, if the pain continues. This done, I look to

the cause; if there has been a chill and fever, I give with the opium hydrarg. chl. mitis, three grains, and if the tongue is moist and covered with a brown fur, I add five grains of quiniæ sulphatis (quinine). So, for a flux from malarial causes, I give the following.—

℞ Hyd. chl. mitis, grs.xij
Opii pulveris, grs.iv-xij
Quiniæ sulphatis, grs.xx. M
Fiat chart No. 4, vel Pil. No. 12.

I give powder or three pills every three hours. I increase or diminish these proportions according to the time the chill comes on, and I increase or decrease the quantity of opium, according to the pain. I move the bowels if they are not moved by the calomel, once each day, either with castor oil and a little spts. turpentine, or with seidlitz powders. After there is a good and thorough action, I give, if the liver is aroused and acting, the following;—

℞. Bismuthi subnitratis,
Opii pulveris,
Quiniæ sulphatis, āā grs.xxiv. M.
Fiat Pil. No. 24.

I give one every two or three hours, to keep patient easy, and free from pain; I continue this plan from day to day, until I succeed in curing my patient; I never keep the bowels locked up, for I find if they are we will have typhoid symptoms, when we will have to discontinue mercurials and substitute turpentine. Thus:—

℞. Olei terebinthinæ, ℥ij
Mucilagi arabicæ, ℥iv
Morphiæ sulphatis, grs.iv.

I give a tablespoonful every three hours. I give this in all cases where the disease assumes a typhoid type, let it be primarily produced from any of the causes I have given, believing, as I do, that turpentine is *the* remedy for a typhoid condition. I also in this condition allow the free use of lemonade, made from citric acid, and not from lemons, as the essential oil in the pure lemon is irritative, and also the sugar of the lemon syrup is objectionable, owing to its becoming acid. I never in any case prescribe flaxseed tea, slippery elm bark, mucilage or gum arabic water; they are insipid, and usually disagreeable to the patient, preventing the absorption of the medicines, and the water your patient drinks; therefore, instead of doing good they are really injurious. "I speak what I do know, and testify of what I have seen." I never use astringents (so called) for the very same reason. They always do harm rather than good. Even claret wine often produces painful stools; I never allow my patients any kind of liquors, except pure cognac brandy. Whisky is absolutely injurious, and so are all the sweet wines. I have lost two patients with this disease in the City Hospital, from using wine, stolen into the ward. Both were improving, and asked to have wine to strengthen them, but it was refused. I give cognac brandy freely when there is no fever, and the skin bathed in clammy perspiration. I have given a bottle in one night, and relieved my patient. It is well suited for cases of congestion. When these remedies fail to stop the discharges, I give per anum:—

℞. Tinct. opii, ℥ss
Aquæ pluvialis, ℥viij.

I give per anum at once, and repeat after each action.

If there be much sloughing, and the disease in the rectum or colon, I give the following:—

℞. Argenti nitratis, grs.iv
Aquæ pluvialis, ℥viij
Morphiæ sulphatis, gr.j.

I give per anum at once and repeat as above, after each operation. You must be careful not to increase the proportion of the nitrate of silver, for if the injection is too strong it will burn and irritate instead of soothe. If this preparation burns, you must lessen the quantity of nitrate of silver. In giving these injections never give them in starch water or gruel, as they prevent their local action and absorption, and will cause their return. They are objectionable on the same ground that the mucilages are by the mouth. I always press on the hips and assist the patient in retaining them until all disposition to return is gone. I blister over the liver and spleen when they are much involved, especially when I have failed to arouse them with the mercury and quinine. When the liver, the urine, the saliva and the healthy perspiration are active, your patient will recover under good nourishing diet. The best I know is a soft-boiled egg, prepared gelatin, toast water, which is good at all stages, and should be used where formerly the mucilages were. The bread should be well toasted and slightly burned, and given warm or cold, as the patient prefers it. It does not prevent absorption, but nourishes the patient and prevents the bad smell to a great extent. The stools should always be removed from the room immediately, as they will produce the disease on the nurse or others who may be in the room. They are an exciting cause, and hence it is often thought to be contagious when it spreads by filth. The floor ought to be wiped up once each day, and the room aired after each action.

This plan will cure ninety-nine out of every hundred taken in time, and persevered with to the end.

When I commenced to practice in Mississippi they died all around me, but I did not lose a single case while I lived in the State—five years. I gave them Carpenter's extract of bark, instead of quinine. I did not use bismuth, but I eschewed from first to last astringents, and mucilaginous drinks—all liquors except brandy—and hence my great success. I often cured cases by a simple prescription of laudanum, quinine, and No. 6. Thus:—

℞. Tinct. opii, ℥ss
Tinct. capsici comp., ℥ss
Quiniæ sulphatis, grs.v. M.
Sig.—Give at once, and repeat in two or three hours if the pain returns.

This became a standing prescription with some of the planters. When any one would take the disease and quit work, they would give him this, and by morning he would be well, except from the effects of the laudanum. The third day move the bowels with castor oil or seidlitz powders, and if the pain and diarrhœa return give half doses. I now use a great deal the following simple prescription when the secretions are active:—

℞. Quiniæ sulphatis,
Opii pulveris,
Bismuthi subnitratis, āā grs.xij. M.
Fiat Pil. No. 12.
Sig.—One every three hours.

If typhoid symptoms come on I return to the turpentine mixture, and if the tongue is covered with the brown coat, I give:—

℞. Hyd. chlor. mitis,
Rhei. pulveris,
Ext. taraxici, āā grs.x. M.

Fiat Pil. No. 6.
Sig.—Give three, and repeat in three hours.

When the patient recovers his health partially, and still has occasional stools with blood, or they are too frequent, his secretions being active, I give :—

℞. Opii pulveris, grs.xij
Argenti nitratis, grs.vj M.

Fiat Pil. No. 12.
Sig.—One every four hours.

Or:—

℞. Argenti nitratis, grs.viij
Morphiæ sulphatis, grs.iv
Aquæ pluvialis, ℥viij.

Sig.—Tablespoonful three times a day.

I cured, in 1848, a Mr. Gee, of Panola county, Miss., with this prescription, after he had taken medicine from nearly every physician in the country. I never use Rochelle salts and morphine, nor sulphate of magnesia and morphine, unless there is high fever, and the patient has been bound up with astringents, and is in a typhoid condition ; in this condition they often do good, and are better than oil, but no better, if so good as seidlitz powders.

Where the cause originates from the stomach, and is produced by dissipation, I give :—

℞. Acidi nitrici gtts.xxx.

Sig.—Give ten drops three times a day in a glass full of water, and drink through a quill or reed.

Again, when the digestive organs are involved, and the spleen enlarged, and where dyspepsia is the exciting cause, I give :—

℞. Tinct. opii, ℥iv
Aquæ ammoniæ, ℥j
Tinct. capsici comp., ℥iv
Tinct. cinchonæ, ℥iv
Syrupi sarsaparillæ, ℥ij. M.

Sig.—Give a wineglassful in a tumbler of water, three times a day, or it may be taken in good French brandy.

With this combination I cured a gentleman after suffering for years, who had taken medicine from every physician he had confidence in. I cured a Mr. Bingham after he was given up by several physicians with the following :—

℞. Hyd. chlor. mitis, grs.xxx
Opii pulveris, grs.xv
Bismuthi subnitratis, grs.xxx. M.

Fiat Chart No. 3.
Sig.—One every four hours until all are taken.

He had scarcely any pain after the first dose. The next day I gave him fifteen grains of quinine, in four doses, and moved his bowels with a seidlitz powder. Repeated the same next night. He got well without a bad symptom. He had the disease to return, and has been relieved several times with the same prescription. When I gave him the dose his attending physician was scared, and begged me to divide the dose; I refused, on the ground that less would not allay the pain and make him sleep. He rejoiced at the result.

I cured a little girl at Houston, after taking medicine from several physicians, with the following (but this case was discharging water and mucous stools; when I saw it the hemorrhage had ceased):—

R.	Quiniæ sulphatis,	℥j	
	Ferri lactatis,	℥ss	
	Morphiæ sulphatis,	gr.j	
	Bismuthi subnitratis,	grs.xx.	M.

Sig.—Give six grains of this mixture three times a day, or oftener, if the bowels are not quiet.

When there is great tenesmus, and I wish to avoid giving opium by the stomach, I use suppositories of opium, from one to five grains, made into pills and inserted into the anus after each evacuation. This often more effectually allays the straining disposition than if given by the mouth, and does not affect the digestion.

I have found this disease more stubborn here on this Island than anywhere I have practiced. Quinine is not so well borne, and the cases much oftener assume a typhoid type. I attribute this to the poor diet that many I find in the hospital have been used to. The worst cases of this disease, and the most stubborn I have ever met with, were those following rubeola (measles) in the negro hospital, which I had charge of in 1863. I treated several hundred of these cases, and lost some eight. I made post-mortems on all, and I found the peritoneum highly inflamed and the colon contracted. I then used much more mercury and less quinine, and had better luck. I also blistered these cases as soon as I discovered the tenderness of the abdomen. I found brandy always made them worse, even though they were bathed in sweat.

To be brief, and sum up the whole, give—

1. Opiates, to relieve pain and keep your patient easy.
2. Mercurials, to subdue inflammation and start the secretions.
3. Quinine, to prevent mortification, congestion and relapses.
4. Derivatives, blisters, and stimulants, to assist the mercurials and quinine.
5. Argentum nitras and bismuthi subnitras, for their local effect, to subdue inflammation.
6. Evacuants, oil, spirits of turpentine, seidlitz, etc., to prevent absorption of the vitiated secretions and excretions, thereby preventing the typhoid state or condition.
7. Avoid astringents (proper); they prevent absorption and produce pain, and prevent the effusion of the effete substances, and, as it were, dam up the stream from the liver, and thereby produce the typhoid condition.
8. Nourish your patients with egg diet or prepared gelatin, for they are the most easily digested and assimilated of all kinds of food.

Prognosis.—Favorable in most cases when treated on the above plan, but very fatal treated with astringents, salts and laudanum, or Rochelle salts and morphine.

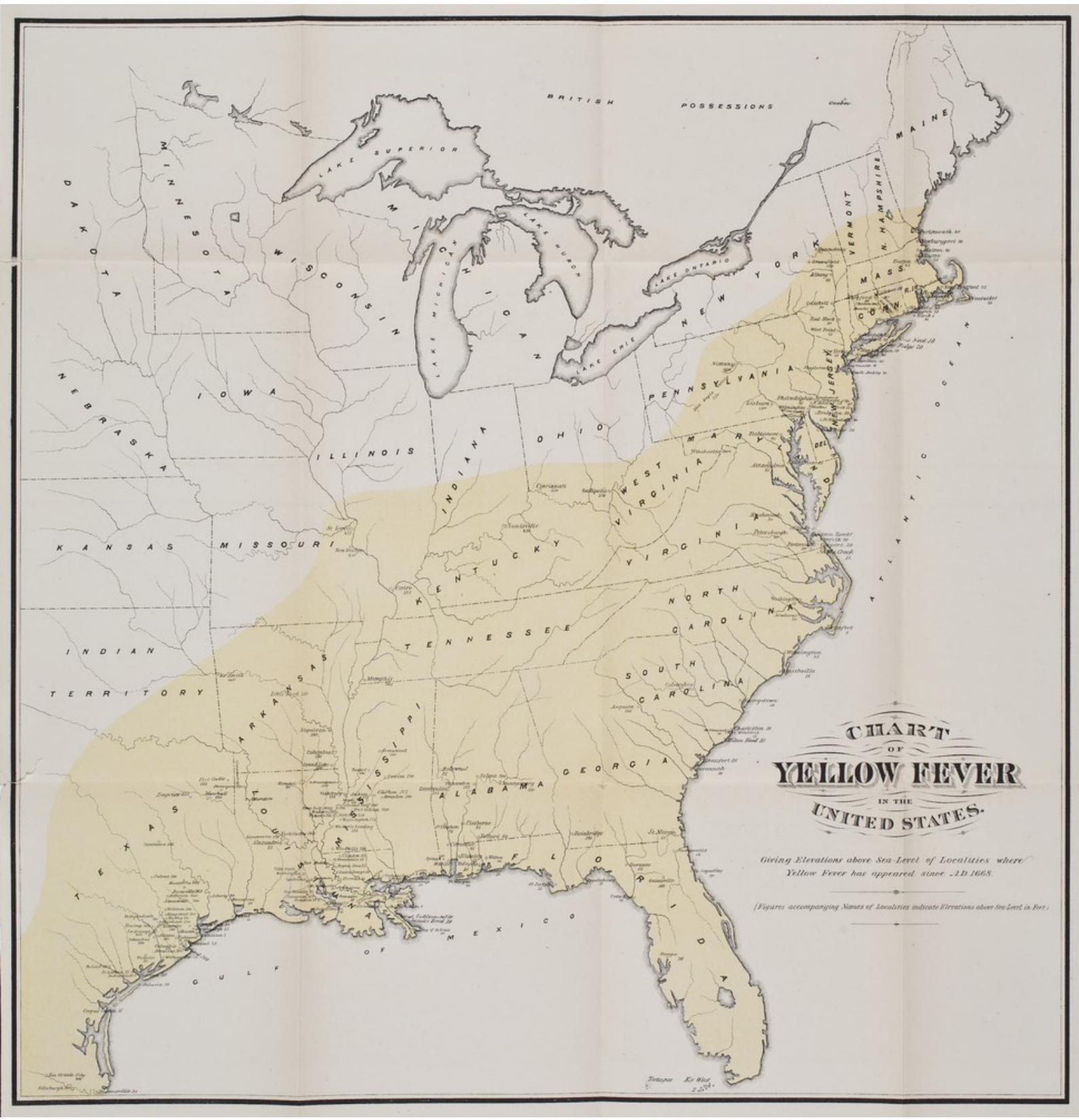
I have not, in twenty years, lost twenty patients with this disease, that I had sole charge of, and managed to suit myself. I do not think any more of a patient's

dying with this disease than I do with chills and fever. It is a tedious disease, and cannot be cured under ten days, when the bowels have once sloughed. Every time they are moved it irritates the abraded surface, and causes it to bleed, and destroys part of the granulations, hence the process of restoration must be slow.

In this paper I have alone spoken of diarrhœa, and not dysentery. I have treated of that condition of inflammation of the intestines in which you cannot keep anything in them (diarrhœa), and not that condition of the intestines in which you cannot get anything out of them (dysentery). In the first, we find purgatives (proper) useless and injurious; in the latter, purgatives are useful and will relieve, hence the good effects of salts and laudanum, and Rochelle salts and morphine. They liquefy the scybillæ, and pass them through the contracted intestines when they could not pass in an undissolved state. Physicians often confound the two diseases, which should not be done, as the treatment is different, and the pathological state justifies it. Both are attended with frequent stools; one, dysentery, nothing but jelly and mucus, and scarcely a spoonful at that; the other, diarrhœa, with mug-full after mug-full. Both have pain, which should immediately be relieved with opium; both often have fever; both are brought on by the same causes. One effuses blood and serum, with mucus in the end; the other absorbs serum and hardens into scybillæ the usual healthy discharges. You must subdue the effusion in one, but increase it in the other.

I have often seen a diarrhœa converted into a dysentery by the use alone of opiates and astringents. One case, I well remember, was swelled out to a dropsical dimension by sugar of lead and opium, and it took me two days, with injections of warm water and liquortive purgatives (cream of tartar, Epsom salts, etc.), to effect a complete action on the bowels. One of the two physicians in attendance thought he had spinal irritation, and indeed he was right, but the astringent (sugar of lead) had caused it. I will close this paper by the solemn injunction to all physicians: *Never make a prescription until you understand the pathological condition.* Better do nothing and give nature a chance.

INDEX.


BRITISH POSSESSIONS
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ONTARIO
LAKE ERIE
MINNESOTA
WISCONSIN
IOWA
NEBRASKA
ILLINOIS
INDIANA
OHIO
MICHIGAN
NEW YORK
MAINE
VERMONT
N. HAMPSHIRE
MASS.
CONN.
R. I.
PENNSYLVANIA
NEW JERSEY
DEL.
MARYLAND
WEST VIRGINIA
VIRGINIA
KENTUCKY
MISSOURI
KANSAS
INDIAN TERRITORY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
ARKANSAS
MISSISSIPPI
ALABAMA
GEORGIA
LOUISIANA
TEXAS
FLORIDA
GULF OF MEXICO
ATLANTIC OCEAN
CHART OF YELLOW FEVER IN THE UNITED STATES.
Giving Elevations above Sea-Level of Localities where Yellow Fever has appeared since A.D. 1668.
(Figures accompanying Names of Localities indicate Elevations above Sea Level in Feet.)

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Very Scarce

Texas