

Weston



- Dissertation -
- on -
Yellow Fever

- G. B. Weston -

I Introduction.

It is my intention in the following pages to give a description of Yellow fever, as it is usually met with, and then proceed to an account of the Epidemic which visited Charleston S.C., during the Autumn of 1864.

After describing this Epidemic, I shall endeavour to shew that the disease is not contagious, and though not sufficient by sanguine, to suppose that the evidence adduced by me, will be entirely conclusive, yet if I succeed in adding one fact, to those already accumulated by various writers, in favour of the non-communicability of the disease in question by contagion, I shall consider my object accomplished.

I feel that some apology is due the Faculty, for sending in an Essay, whose defects are so apparent even to myself, but I hope it will be some excuse, when I mention that this is merely a copy, written from

memory, of one prepared with more care while at the hospital, and which contained descriptions of several cases taken at the bedside; this however I unfortunately lost, with all my effects, at the evacuation of Charleston, owing to my having been obliged to leave in a hurry, and with limited means of transportation.

— G. B. Weston —

— March 1866 —

Thesis

on
Yellow Fever.

Yellow fever, called also "Typhus Ictericus," and "Omito Negro," from its two most prominent symptoms, is a disease prevailing in certain hot climates, and in places situated upon the sea coast, or on streams emptying into the ocean. It seems necessary for its production that a number of human beings should be congregated together; thus it is found in cities, and also on board ships entering those latitudes in which it prevails. When occurring as an epidemic, it makes its appearance towards the end of summer, or at the commencement of autumn, and has been thought to depend upon a high degree of temperature, continued for a certain length of time; but that this is not the only agent concerned in its production, is seen from the fact, that it has never been known to occur in Calcutta, or in various other places, where a high degree of temperature is present, and continues for a much longer

time than has been considered necessary for its production, I have noticed in Charleston, on more than one occasion in which the Disease prevailed in an Epidemic form, that the seasons during which it made its appearance, were characterized by a very wet summer, followed by an unusually dry autumn, and it is not difficult to understand, how this alternation of moisture and heat, by loading the atmosphere with emanations from decaying vegetable matter, could be a fruitful source of fevers of any kind, and have a large share in the production of the one under consideration. As a proof of this, it has long been a subject of remark, that the Bilious fevers occurring on the islands around Charleston, have always prevailed to a great extent, and been of a most malignant type, during the summers of those years, in which Yellow fever visited the City; we had abundant opportunities of witnessing this in 1864,

When we received patients into the Hospital, not only from the islands, but also from the different batteries situated in the City itself.

Certain meteorological conditions of the atmosphere have also been spoken of in connection with the origin of Yellow fever, but as this has been made as yet, only to a small extent the subject of investigation, it would be quite out of place to discuss it in a treatise, which it is my object to make as practical as possible.

Symptoms No two epidemics present identically the same symptoms, and even the same epidemic may change its type, usually becoming milder as the season advances, and cold weather approaches; there are however certain symptoms invariably present, and considered essential to the disease, to these I will now direct my attention. The fever then, is ushered in usually by a feeling of chilliness, with pains of a rheumatic character, in the limbs and

back, there is also injection of the Con-
junction, and a certain degree of head-
ache; then follow the ordinary phenom-
ena of fever, characterized here however
by severe headache, anxiety, restlessness,
confusion of ideas, - which last amounts
in severe cases to actual delirium -
and an increase in the pain complain-
ed of in the limbs and back; - the pulse
is quick, but weak and compressible, the
tongue moist and slightly furred, the
bowels empty, and the urine scanty
and high colored; after the fever has
continued for a few hours, tenderness
is complained of in the epigastrium,
and nausea, with vomiting soon makes
its appearance; the vomiting in these
cases is peculiar, in that it seems to
take place without any exertion on the
part of the patient; it is accompanied
by an eructation of gas, which is in-
cessant, and very characteristic of the
disease; - this condition of things usually
continues for three days, and then al-

most entirely disappear, leaving the patient in apparently a convalescent state: this constitutes what authors have described as the second stage of the disease: it is but an apparent amelioration of the condition of the patient; the disappearance of the fever being dependent upon the failing powers of the system: this calm, which is but the prelude to the full force of the malady, generally lasts for about six hours, and is then succeeded by the stage of collapse: the skin now begins to acquire a yellowish hue, which commences on the face, and gradually extends itself to all parts of the body: the nausea which has never been entirely absent assumes a degree of intensity, greater than it existed in before, the vomiting is incessant, the vomited matters pouring out of the mouth in a stream, and with little effort on the part of the patient; there is continuous eructation; extreme prostration now sets in, the pulse becomes irregular and weak, and in every case

to be felt at the wrist, though at the same time the heart may be pulsating violently; the tongue becomes dry, brown and coated; sores form upon the lips and teeth; the urine from being small in quantity may become entirely suppressed; the breath is ammoniacal; a great tendency to hemorrhage from the different mucous surfaces exists, "Melœna" and "Epistaxis" being of frequent occurrence; the cutaneous sensibility is much impaired, counter-irritants applied to the skin producing little effect; there is also little vitality in the tissues, ulceration, and sloughing of parts being not at all uncommon; there is much hebetude of countenance - the patient lying in a state of apathy and quite indifferent to all around him; finally at a period varying from three to four days, or even earlier, from the cessation of the debris stage, the vomited matters begin to assume a "dark brown" colour, constituting what has been called "Black vomit", this dark coloured matter

also escapes by the bowels, and its appearance in the majority of cases, precedes death by a very short interval; few recovering in whom it has been present. The fatal termination is common, by through exhaustion, though Coma, and convulsions, towards the close of the disease, are by no means rare, and one or both, are invariably present, in those cases, where suppression of urine has been produced, by the peculiar poison of the fever. The symptoms I have described are those usually seen in severe forms of this disease; in many cases of Yellow fever however, and especially those occurring towards the close of the epidemic, Convalescence dates from the subsidence of the fever, and though slow, advances steadily to complete recovery; in other cases, after the stage of collapse has continued for some time, the system seems to rouse itself from its lethargy, a secondary fever makes its appearance, which is however of a very asthenic type,

and may end fatally, though more often under proper treatment recovery takes place: finally in a third class of cases, after black vomit has occurred, the system reacts, and the patient recovers, the "materies morbi" having been apparently eliminated from the system by the incessant vomiting. These recoveries however, after the occurrence of Black vomit, are extremely rare, as the powers of the system are seldom strong enough to resist the amount of putrefaction, which always accompanies this form of vomiting.

Before proceeding to describe the different causes which operate in the production of this disease, I will say a few words respecting its nature, concerning which some diversity of opinion exists. Many authorities contend that it is merely a severe form of Bilious fever: others, that it is a disease sui generis, and presenting no features in common with Bilious fever. Without entering

into the various arguments that have been adduced in support of each opinion. I think it probable, as is often the case when such opposite views are entertained on any subject, that the truth is to be sought for between the extremes; accordingly, it is my belief, and I have had abundant opportunities of observing both diseases, that, Yellow fever is nothing more than Bilious fever, with something super-added, what this "something" is, I am unprepared to say, but that it is in some manner connected with emanations from human beings, is I think, rendered probable, by the circumstances under which the two diseases occur; they have already alluded to the fact, that during those seasons in which Yellow fever visited Charleston, Bilious fever was more prevalent, and of a more malignant type, but while the latter occurred principally in the country and was limited in a great measure to the neighbourhood of rice-fields, the

former was confined exclusively to the city, where in addition to the malaria considered necessary for the production of both diseases, there were also the emanations from numbers of human beings living together; that this alone however is insufficient to account for the difference observable between the two diseases, is rendered evident by the fact, that, Yellow fever only occurs in cities, situated upon water courses, where some other cause in addition to malaria, and human emanations, must be in operation; again, as has been already mentioned, there are certain localities which are quite exempt from the disease, where nevertheless all the causes considered as necessary for its production appear to exist. Besides a partial community of causes, there are other circumstances which point to the two diseases in question being closely allied to each other, for we notice, that they both terminate on the appearance of frosts, that negroes though amenable to all other diseases, which affect the

white man, enjoy an almost complete immunity alike from Yellow and Bilious fevers; again, Strangers are more apt to be attacked by both diseases than natives; and lastly, as I shall endeavour to show afterwards, neither disease is contagious, nor does one attack of either, ensure against a second attack of the same!

Causes of Yellow Fever. Among the predisposing causes, the most powerful perhaps, is, being a stranger in the locality in which the disease is prevailing, intemperance of any kind, whether in eating or drinking also renders a person more apt to be attacked, other causes which predispose to the production of other fevers, also act in the same way in this, such as, exposure to the noon day sun, or to the chilling dews of night. The only exciting cause is exposure to the atmospheric influences, concerned in the generation of the disease.

Diagnosis is not difficult where the disease presents itself in a well marked

form, with injected conjunctiva, and an early appearance of the gastric irritability, though even here it may be mistaken for Bilious fever, in which both these are often present to some extent, the continuance however of the febrile stage without intermission, or remission for such a length of time, and the greater amount of vomiting, with the excessive eructation of gas, would arouse suspicion as to the nature of the case, even before the extreme prostration, succeeding the termination of the fever, together with the appearance of black vomit, served to render the nature of the case sufficiently evident. Milder forms have been mistaken for "Dengue", "Catarrhal fever", or in cases where the pains in the back and limbs were severe, for even "Rheumatism", but the knowledge of the prevalence of the epidemic would be a sufficient guide to diagnosis. Even if the injection of the eyes, and urgent vomiting, always present to a certain extent even in the mildest forms of the case, did not remove all difficulty that might

present itself in the way of a recognition of the disease.

Prognosis. varies with the epidemic, some being extremely mild, and in which recoveries are the rule; while others, even characterized from their commencement, by the most severe symptoms, and recoveries in them are the exceptions. As a general rule, the epidemic, however malignant it may have been at its commencement, invariably becomes milder, as the season advances, so that towards its termination, a much larger proportion of cases recover.

Among the symptoms that would lead you to predict a fatal termination, a total suppression of urine stands foremost, next in order may be classed the appearance of black vomit as few recover in whom this has been present as a symptom. An early disappearance of the febrile stage is also an unfavourable sign, as it indicates that the vital powers have succumbed, after a short struggle, to the influence of the poison. Other unfavourable

able signs of a minor nature, are the appearance of petechiae over the body, an early occurrence, and deep hue of the yellowness of skin, and an apathy and indifference on the part of the patient, as to his fate; delirium making its appearance at any stage of the disease is always to be regarded as unfavourable. On the other hand one of the most favourable signs is the production of ptyalism as the result of mercurial action, or the appearance of stranguary following the application of a blister, the disease seldom terminating fatally in those cases where these effects have been noticed; an extension of the fever beyond its usual limits, or the appearance of a secondary fever would also inspire hope as to the result, though in many cases where a secondary fever makes its appearance, it finds the patient already too much exhausted to withstand its ravages, and serves merely to prolong his life for a brief period, death taking place ultimate

ly through exhaustion, or else he recovers after a tedious convalescence, to find his constitution permanently injured.

Treatment. To enumerate the different medicines that have been employed, and with alleged success in the treatment of this disease would of itself occupy more time than I have to devote to the whole subject, for there are few articles in the pharmacopoeia, that have not at some time, and in the hands of different practitioners, been thought useful, or even to act as specifics; among these, mercury has always held a prominent position, and even at the present day, is considered by many as the sheet anchor in the treatment of Yellow Fever; this idea no doubt arose from the fact, that the development of its physiological action, as has been already mentioned, was in the majority of cases succeeded by recovery, but on the other hand it has been found impossible to produce this effect in seven cases, so that instead of viewing the appearance of

ptyalism, and the successful issue of the disease, in the relation of cause and effect, we ought rather to regard the former, merely as an indication that the attack was a mild one, and would no doubt ^{have} indeed in recovery under any rational treatment; while therefore mercury given with a view of producing its specific action is of little use, there is no doubt it acts beneficially, when given at the commencement of the attack, as a cathartic, for here it has the effect of stimulating the liver, which is usually torpid, while at the same time it clears the bowels.

Opium has been a favourite with many given in large doses; its supposed action being to relieve the congestion of internal organs, and especially that of the stomach, in the only cases however which came under my notice in which the irritability of the stomach permitted of its administration for any length of time, cerebral symptoms were soon developed, delirium ending in coma being the re-

cult, Among the other remedies that have enjoyed the reputation of being Specifics, may be mentioned "Tincture of the Muriate of Iron," "Acetate of lead," "Iodide of potassium," besides others too numerous to mention, most of which were employed empirically, and for the development of no particular action. Their only recommendation being that some cases, in which they had been administered, advanced to recovery; thus during a mild Epidemic, some one of these so called Specifics would be used with very successful results, but when subjected to the tests in another Epidemic, whose type happened to be of a more malignant character, it was found to be wholly ineffectual in controlling the disease, and was replaced very soon by another, which being employed towards the close of the season, when the disease had nearly expended itself, soon acquired as high a reputation as its predecessor, only however to yield it to a third remedy, whose popularity

would be equally as short lived; the fact is, when the disease presents itself in an ordinary degree of severity, it is only during the first few hours of the attack, that remedial measures, in the shape of medicines introduced into the stomach, can be of any avail, for after this, the extreme irritability of that organ, so prominent a feature of the disease, renders the introduction into it of any substance, even of morphia in small pills, productive of more injury than benefit; by adding to the amount of irritability already existing; hence it must be inferred, that those cases in which any particular medicine has been alleged to have effected a cure, must of necessity have been exceedingly mild, to admit of such medicine having been retained by the stomach, and they no doubt would have terminated favorably, and perhaps more speedily had no such medicine been administered. While denying the existence of any specific in the treatment of this disease I still believe in the efficacy of medicines, and am

at the same time convinced, that much may be done for the patient, by appropriate treatments at the commencement of the attack, and also by supporting his system during the stage of collapse; and I think I have seen good results in more than one instance, attend the following plan of treatment:

If the patient be seen soon after the first symptoms have made their appearance, a Cathartic of Calomel should be administered, while at the same time a large blister is applied over the Epigastrium. After the vomiting has made its appearance, it only adds to the sufferings of the patient to make him swallow anything, but the vomiting may be relieved to some extent, by sprinkling morphia over the blistered surface; giving him ice to hold in his mouth, and tepid sponging of the surface of the body, also add much to his comfort; if any cerebral symptoms supervene, cold cloths to the head, with

that Pedicularia, should be resorted to; as soon as the febrile stage has passed, and collapse sets in, our attention should be directed to supporting the ^{vital} strength, and this can only be accomplished by Enemata of strong beef tea, with brandy, taking care to avoid ammonia, as the blood already contains a large quantity of it; if the prostration be very great, we should also have recourse to punction with Croton oil to the chest and spine, while at the same time Sinapisms are applied to the extremities; by these means we hope to support the vital powers, and keep our patients alive, until the disease has expended itself, and the poison has been eliminated from the system, as no doubt it is, by the act of vomiting. This plan of treatment, founded on rational principles, though failing in the majority of cases, owing to the malignant type of the Epidemic, certainly appeared in more than one instance, to be productive of benefit, and

had at least the advantages of being productive of no injury, which is more than can be said of other means of treatment adopted during the same epidemic; thus a favourite plan with many, was to commence the treatment with an emetic, followed by a brisk cathartic, then Calomel, combined with opium, and persevered in, despite the great irritability of stomach present; counter-irritants were also applied to the epigastrium, but could have little effect in soothing the irritability of stomach, when it was being hourly increased by the internal administration of medicines; besides some such course of treatment as the one just described, other practitioners had recourse to venesection, which could not have been otherwise than injurious, in a disease, whose characteristic was a stage of prostration, which required more than ordinary powers of constitution on the part of the patient, to resist.

Pathological Anatomy. There are few diseases, perhaps, in which the post mortem appearances are so inadequate to account for the urgency of the symptoms during life, than in the disease under consideration, one would naturally suppose, that some extensive lesion of the stomach would be visible after death, to explain the irritability of, and the great degree of tenderness referred to that organ, but contrary to our expectations, an examination reveals at most, in the majority of cases, only a slight degree of congestion of its mucous membrane, it being exceptional to find any ulceration of its coats; and in one post mortem examination at which I was present, of a case where the symptoms had been especially well marked during life, the interior of the stomach, after having the black vomit adhering to its walls removed, presented a perfectly healthy appearance; there are in fact no morbid appearances peculiar to this

disease, those usually found, differing in no respect, from what we would expect to find, after death from other fevers; such as congestion of various internal organs with occasionally effusion into the ventricles of the brain, in those cases where cerebral symptoms had been developed during life. Some authorities have described a dry anemic condition, and yellow colour of the liver, as being pathognomonic of death from Yellow fever. but the testimony of other observers, goes to show, that this condition is by no means universal; and in the subject, at whose examination I was present, the liver though to a certain extent congested, and therefore somewhat enlarged, was in other respects, apparently quite normal, and certainly presented none of the appearances described as peculiar to it.

The yellowness of skin, though it becomes of a deeper colour after ^{death}, can hardly be classed among the post mortem appearances, as it is invariably found present to some extent, during the course

of the disease, and apparently owes its origin to the same cause, which produces the Echymses, so distinctive of Purpura hemorrhagica; viz a diseased condition of the blood, which gives it a tendency to become extravasated into the cellular tissue; that this is the true explanation of its occurrence, is rendered probable by the fact; that other hemorrhages are common in the disease, as from the nose, bowels, and stomach, the substance known as "black vomit", being generally admitted now, to be nothing more than altered blood, from the mucous coat of the last mentioned organ.

Kidney disease. Lawson

Having concluded my description of Yellow fever as it usually appears, I now proceed to an account of the Epidemic, which visited Charleston, during the autumn of 1864; and shall then endeavour to shew, that the disease is not contagious.

Various circumstances, combined to render the Epidemic of 1864, more malignant than any of the preceding, by which the city was visited; thus the population was to all intents and purposes a foreign one, consisting as it did, of troops, brought from the upper portion of the state, many of whom had never been on the seaboard before, and who in addition, were badly fed, from the nature of their duties, much exposed, and subjected to those depressing influences, ever found to affect the garrison of a besieged city; it is not to be wondered at then, that after the appearance of the first case, which was noticed towards the end of September, others fol-

came in quick succession, and the disease soon became general. I was attacked at the time to the Naval Hospital, situated in the suburbs of the city, and during the continuance of the disease, which lasted about six weeks, we had admitted upwards of thirty nine patients, of which number, only seven recovered; the disease terminating fatally in nearly every instance during the first weeks, but gradually becoming milder towards the end, so that in the last weeks the majority escaped; the peculiar virulence of the epidemic may be inferred, when I mention, that this number of patients, were received from a body of Marines, numbering about one hundred men, who were doing duty on the wharves; as we did not receive a single case from the gun-boats, which were lying in the harbour, and between which and the shore, no communication was permitted, beyond what was actually necessary.

The period of incubation, as illustrated by one case, was

Exceedingly shock, thus Dr. Ewart, an Assistant Surgeon in the Navy, was ordered from Wilmington, where there was no Yellow fever prevailing; to Charleston, for duty on one of the gun-boats; he arrived in the City at a time when the fever was at its height and too late in the evening to have a boat sent him from the Fleet, accordingly he was compelled to spend the night in the City and proceeded on board the next morning; the consequence was, he was taken ill the first night he spent on board, and his symptoms increasing during the following day, he came up to the Hospital, where he ultimately died, with all the symptoms of Yellow fever; here there was an instance of the disease making its appearance within twenty four hours, after exposure to the cause. The duration of the disease in those admitted into the Hospital at the commencement of the epidemic, was much shorter, than I have described it to be usually. The period stages in many of these cases terminating within twenty four hours, the stage of

Collapse, with "black vomit", rapidly supervening; and death closing the scene very soon after; towards the close of the Epidemic however the fever sometimes extended over four days, being succeeded by ^{nothing} more than a certain amount of prostration, and convalescence dating from its subsidence. It was found impossible to predict from the character of the symptoms at the commencement, whether the attack would prove a severe one or not, as of the cases which proved most rapidly fatal many presented on admission no symptoms of an urgent character, while conversely, towards the close of the Epidemic, more than one patient recovered, who was found on admission to have high fever, and marked injection of the conjunctiva, with severe headache, and pains in the back and limbs. There was observed a great tendency to sloughing of the soft parts during the course of the disease, this was well exemplified, in the case of a man who had undergone amputation at the wrist, and

who subsequently contracted the fever while in the hospital, in his case, the Stumps ^{thru} nearly healed, commenced to slough, and a considerable portion of the tissues had been destroyed before death, though the attack was comparatively of short duration. I noticed also in many of the fatal cases, an ex-coriated condition of the prepuce, towards the last stages of the disease; this was at first ascribed to the action of the Croton oil, brought about by the patient rubbing his chest, to which the oil had been applied, and afterwards placing his hands in contact with the parts; that this was not the true explanation of its occurrence however, was satisfactorily proved, by its having been observed in several cases, where the oil had not been employed, so that there can be little doubt, of its having been one of the effects produced by the fever poison, and contributes to show, how much the vitality of the ^{parts} was impaired by the disease in question.

In one case the

Principal force of the disease, appeared to be expended upon the mouth, there being extensive ulceration of its interior, with a copious expectoration of blood; while at the same time, there was comparatively little irritability of stomach, scarcely any vomiting being present, until the occurrence of black vomit; this condition of the mouth, was not due, as might be supposed, to mercurial action, as there was an entire absence of all foetor in the breath, and besides, in no case treated in the hospital, was mercury ever given in such quantity, and so combined, as to produce ptyalism. In many cases before death, the pulse was found to be entirely absent at the wrist, notwithstanding the heart, at the same time, was beating tumultuously. In a few cases, a total suppression of urine immediately preceded the fatal termination, producing Coma, with or without convulsions; those however in which no suppression of urine was present, generally retained their faculties to the

End, and would reply, when spoken to, but displayed no interest in what was going on around them, and seemed quite regardless of their fate.

The treatment employed by us, is that I have already described in previous pages, and it was relied on in all cases, which we had an opportunity of treating, from the commencement of the attack; there were many cases however, which were not sent up to the hospital, until the disease had become so firmly established, and the gastric irritability so extreme, as to render any other measures beyond counter-irritants applied externally, with Stimulant Emetics when the collapsed stage made its appearance, useless, if not positively injurious. Again in a third class of cases, which were not received by us until the stage of collapse had supervened, even counter-irritants were of no avail, as blisters even, would fail to produce the slightest rubefacient effect upon the skin, here our sole dependence was upon Stimulant Emetics.

hoping by their means to support the strength of the patients, though I am not aware that we accomplished our object in a single instance, as the vital powers had sunk too low, to admit of the system responding to any medicines. In only one case (viz that mentioned before, in which there was copious expectoration of blood, with little vomiting) were we tempted to try any of the so called Specifics, and Chlorate of Potash was the one chosen; more however with a view to its action as a mouth wash than from any belief in its virtues as a Specific. That our treatment was not very successful, cannot be denied, but its want of success, though ascribable in a great measure to the malignant character of the disease, is also partly to be accounted for, by the fact, that few of the patients were sent to the hospital, until the disease had advanced beyond the period, at which medicines could be employed with the greatest hope of success; at the same time it

must be admitted, that at the commencement of the Epidemic, though there were several patients subjected to treatment as soon as the first symptoms made their appearance, yet there was only one case which terminated favourably, recovery being in this case preceded by Strangury, as the result of the successive application of blisters.

I now proceed to consider the question, as to whether Yellow Fever is contagious or not, and perhaps there is no subject in medicine which has given rise to more controversy; for though medical men having every opportunity of rendering themselves practically acquainted with the disease, have devoted their minds to elucidating the subject, it may be considered as much a point in dispute at the present day, as it was when the science of medicine was in its infancy, with however this difference, that those believing in the impossibility of the disease being communicated by contagion, now greatly outnumber those holding an opposite opinion.

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and there have not been wanting examples, of those firmly believing in the doctrine of contagion, becoming converts to the opposite opinion, after having had opportunities of seeing several successive epidemics.

Among the arguments brought forward to prove that the disease spreads by contagion, is the fact, that on the appearance of one case, others follow in rapid succession, but this is also observed in Bilious fevers, and yet no one considers them contagious; It has already been mentioned as probable, that Yellow fever owes its origin partly at least to malaria, and if this be admitted, then the fact of one case being rapidly followed by others, is easily explained, by supposing that the same condition of atmosphere concerned in the production of one case, by increasing in intensity, and spreading, would be instrumental in giving rise to the others; that this is the true explanation, is rendered probable, by the fact, that there is no well authenticated account on record, of a case of Yellow fever giving

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rises to others, when removed from the atmosphere in which it originated, and takes to a perfectly healthy locality; instances have been mentioned it is true, to prove the opposite, but these do not bear investigation. Thus the appearance of the Epidemic in Charleston during the war, was attributed by the Contagionists, to the disease having been brought from "Massaw", where it was prevailing, by a blockade runner, but unfortunately for this assertion, it was found on investigation, that the vessel supposed to have brought the disease, had never had a case on board; besides, even had the disease been on board of her, it could have had no agency in the production of the Epidemic, as a season never passes in Charleston without the occurrence of one or more sporadic cases, and yet an Epidemic of the disease is only seen perhaps once in five years, when it may be assumed, that the poison by accumulating in the atmosphere, is present in sufficient intensity to produce it; it appears

probable then, that the Epidemic of 1864, owed its origin to the poisonous state of the atmosphere, rendered more intense, by all attention to Hygiene, in the City, having been neglected during the war.

Another argument adduced in favour of the contagious character of the disease, was that it made its appearance in "Nassau", during the American war, though never known to prevail there before, as the result of the frequent communication between that port and Havannah (at which latter place it is of yearly occurrence) through the agency of vessels bringing goods, intended to run the blockade; now admitting that the disease did make its appearance in "Nassau" at that period, though previously unknown to prevail there, it could not have owed its origin to the cause assigned, for there was communication, between the two ports before the war, and yet the disease did not make its appearance; we must therefore look for some other cause, which existing there during the war, was not

present before, and this is to be found in the fact, that prior to the war, the population of "Nassau" consisted almost exclusively of negroes, upon whom, as we have already seen, the atmospheric influence concerned in the production of Yellow fever, has no effect, as soon as the war commenced however, owing to this port having become a depot for blockade running, there was a perfect influx to it of Europeans, who by adding to the population, favoured the generation of the fever poison, while at the same time, they furnished the best material possible for it to exert its influence upon, after having been generated.

A case occurred during the epidemic in Charleston, which appeared a triumph for those maintaining the doctrine of contagion, it was that of the man already alluded to, as having contracted the disease while in the hospital, recovering from the effects of an amputation which he had undergone, at first sight it appeared impossible that he could

have taken the disease in any other way, than as the result of contagion, for the hospital was situated in the suburbs of the city, and in a perfectly healthy atmosphere; fortunately however, he confessed before death, that he had, on more than one occasion, left the hospital at night, and visited the infected portion of the city, which accounted in a very satisfactory manner for his having taken the disease. There can be no doubt, that many of the so called instances, of the fever having been communicated by contagion, if closely examined into, would admit of an equally satisfactory explanation as the above.

Lastly, as the most convincing proof, that contagion is not concerned in producing the disease, I may cite my individual experience during the epidemic; while it continued, I was living in the hospital, and exposed hourly to any contagious influences that might have existed, but at the same time I took care

never to visit that part of the city, in which the disease was prevailing, the consequence was, I escaped an attack; on the other hand, my colleague in the hospital who relying upon the prophylactic virtues of a previous attack, was constantly in the habit of visiting the infected part of the city; contracted the fever, and narrowly escaped with his life.

In conclusion, I may venture to express the hope, that the day is not far distant when with increased knowledge of the etiology, and pathology of disease, we may be able to give a positive opinion on the non-contagious nature of "Yellow fever;" and by so doing, dispense with the necessity for quarantine, whose paralyzing effects upon commerce and travel, can only be realized by those communities, in whose midst, the disease is liable to occur.

End.