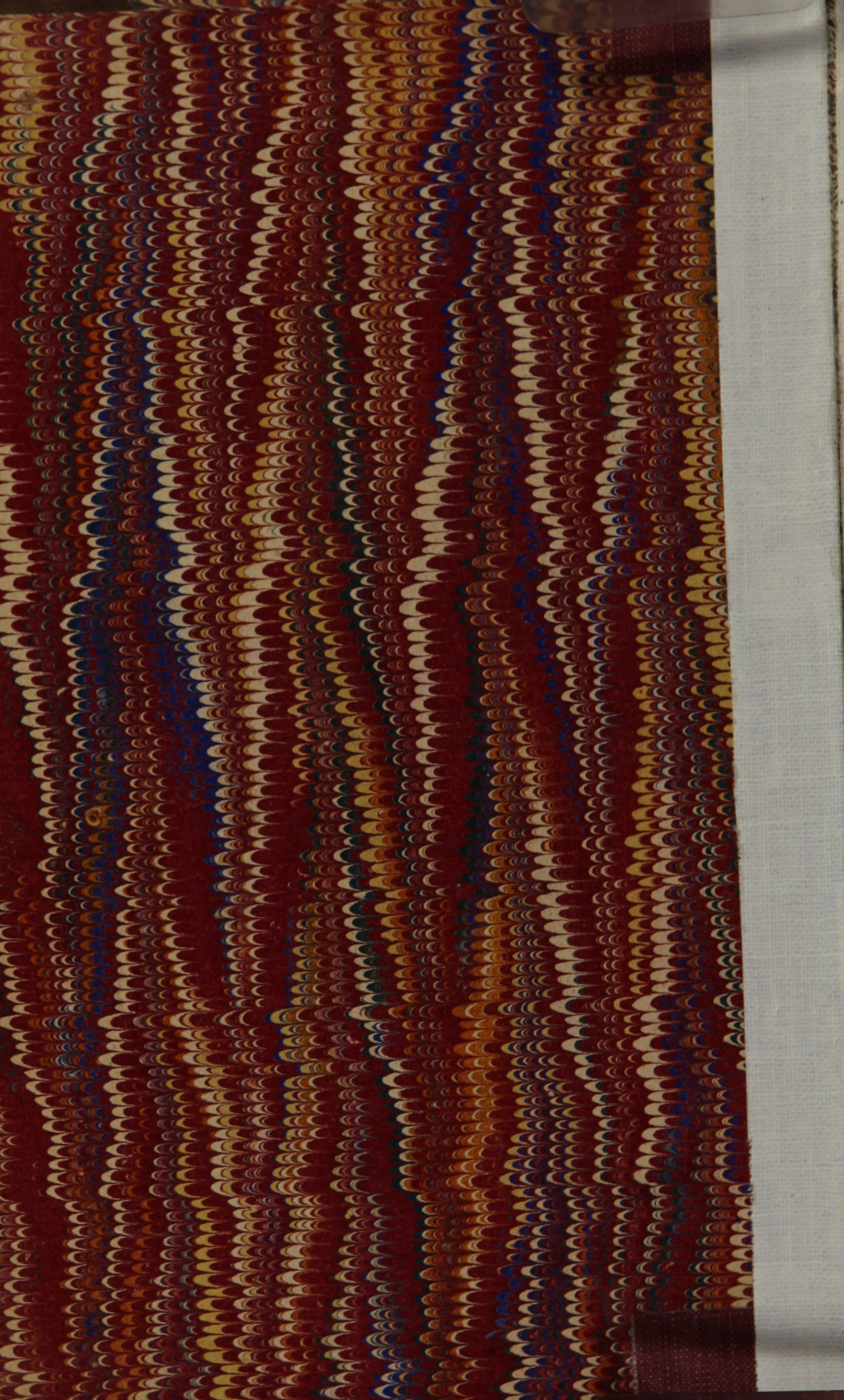
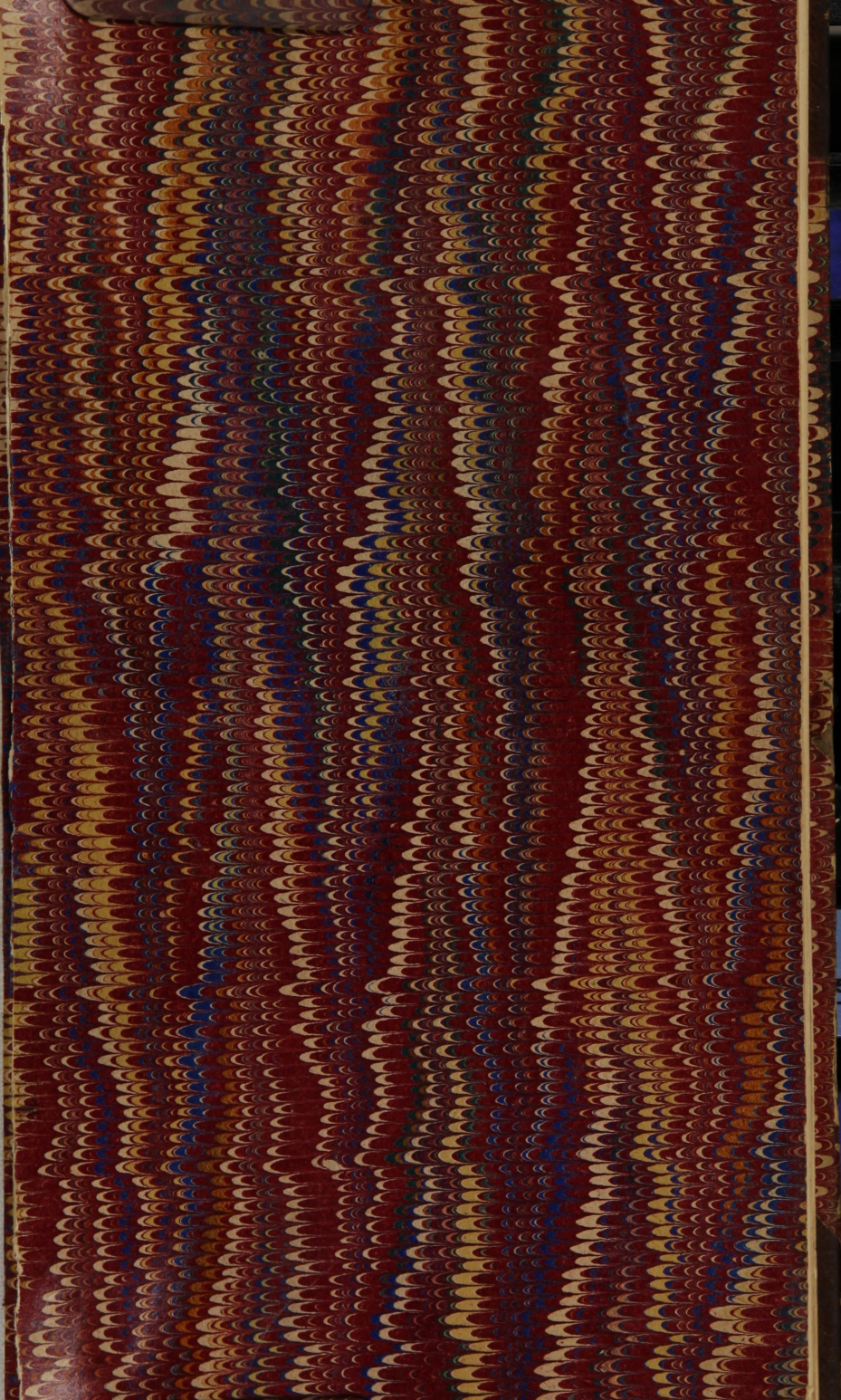


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NORFOLK, VA. COMMITTEE TO
INVESTIGATE THE CAUSE AND ORIGIN OF
THE YELLOW FEVER OF 1855
THE ORIGIN OF THE YELLOW FEVER IN
NORFOLK





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Given to Dr. Otis, by Capt Rufus Pag

REPORT

Norfolk, Va. Committee to investigate the Cause
and Origin of the Yellow Fever of 1855-

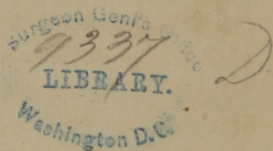
ON

THE ORIGIN

OF THE

YELLOW FEVER IN NORFOLK

DURING THE



SUMMER OF 1855.

MADE TO CITY COUNCILS, BY A COMMITTEE OF PHYSICIANS.

RICHMOND, VA.

PRINTED BY RITCHIE AND DUNNAVANT.

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REPORT
ON THE
YELLOW FEVER IN NORFOLK
DURING THE
SUMMER OF 1855.

THE committee, appointed by the councils "to investigate the cause and origin of the yellow fever of 1855," respectfully submit the following report:

We assure the councils, that the delay in the appearance of our report, which has been to us a source of much annoyance and regret, has not been owing to negligence on our part, nor to an unwillingness to comply with their wishes, but rather to our determination to spare no effort to ascertain all the facts which might serve to throw light upon the difficult subject entrusted to us. In this endeavor we have met with unforeseen difficulties and delays.

Immediately after our appointment, we adopted measures to obtain the most reliable information of the first appearance of the fever in our port, and particularly of its existence on board the Ben Franklin, before her arrival in our waters. With this view we addressed letters to various persons who had been passengers on board the steamer during her voyage from St. Thomas—among others, to Mr. Helm, commercial agent of the United States at that port.

From this gentleman, who came home a passenger in the steamer, we expected to obtain all the information we desired, not only of what happened on board during the voyage, but also of her previous history and condition, as we supposed that he would have in his office a record of all deaths that had occurred on board of an American vessel while in the port where he was consul, and that moreover he could readily obtain from the physicians of St. Thomas, a reliable professional account of any cases of fever which might have come under their notice on board of the Ben Franklin, as well as of the sanitary condition of the island at the time of her departure. After waiting several months for a reply, we again addressed Mr. Helm, and on this occasion through Mr. Marcy, secretary of state, who very promptly and courteously answered our letter, assuring us that he had forwarded our communication to Mr. Helm, with instructions to furnish all the information we desired, and that we would hear from him as soon as it was possible to collect and forward the necessary evidence.

We have waited for Mr. Helm's communication, now nearly a year, and think it useless any longer to delay our report. If hereafter we shall be so fortunate as to obtain an official or professional account of the sickness on board the Ben Franklin while lying at St. Thomas, we will place it before the public in some of the medical journals. We also put a notice in the New York Herald, requesting the passengers on board the Franklin to communicate to us any facts within their knowledge, of the sickness on board of her during the voyage, but thus far without receiving a single letter from this source.

We have thought fit to enter into these explanations, in order to satisfy the councils that our delay has not been owing to remissness, nor the paucity of our facts, ~~nor~~ to want of industry and effort on our part, but to indifference or other motive on the part of those from whom we sought information.

The yellow fever, which, for more than a century, has

engaged the attention not only of the medical profession, but of the governments and people of all commercial nations, has recently been invested with new interest, by the occurrence, within a few years, of epidemics of unusual malignancy in several of our own cities, as well as in parts of South America, where it had been hitherto unknown. Among these epidemics, that of our own town, with whose history we are charged, is one of the most remarkable and interesting, not merely on account of its extraordinary fatality, but because of its appearance so far from its usual habitat, in a climate and place which for a long period of time had been almost entirely exempt from it.

Where the disease is of annual recurrence, it must be difficult if not impossible to point to the sources of its origin. It is only where its visits are rare, with long intervals of healthy seasons, that we can hope, by contrasting all the conditions and circumstances of epidemic and healthy years, to discover the mysterious cause which gives rise to this terrible scourge. We ought, in the sickly years, to be able to find some local causes which had not previously existed, some unwonted meteorological conditions, some foreign and imported elements, or a combination of circumstances to furnish an explanation of the occurrence of so extraordinary an epidemic. This is what we shall endeavor to do in regard to our late epidemic. We are aware that the subject is one involved in difficulties so great as to have baffled, hitherto, the most zealous efforts of the medical profession, which is still divided in opinion upon it—nor are we vain enough to think that we will be able to settle the question. All that we hope to accomplish is to put upon record a faithful and we believe correct history of the conditions and circumstances which preceded if they did not cause the outbreak of the fever among us, and thus contribute our portion to the mass of accumulating evidence, which will, in a few years, we trust, be sufficient to solve the great question so deeply interesting to the health and

prosperity of our seaport cities, viz: *Is the yellow fever of local origin, or an imported disease?*

Before entering upon the investigation of the causes of the fever of 1855, we think it will be interesting and useful to give a slight sketch of the situation and topography of Norfolk, as well as a brief account of previous epidemics of yellow fever which have prevailed in it.

Norfolk lies in latitude $36^{\circ} 50'$ N. and longitude $76^{\circ} 19'$ W. on the east bank of Elizabeth river, at its junction with the eastern branch, being about six miles south from Hampton Roads, about twenty-five from Cape Henry, and about fifteen, in a direct line over a wooded country, from the Atlantic ocean. It is nearly surrounded by water, having the river on the west and south, Newton's creek on the east, and Smith's creek on the north. Several small creeks penetrate into the city, and branching in various directions, serve as natural drains of its surface. The water is salt, and in the river and eastern branch, deep enough for the largest ships. The tide flows into the creeks and coves twice a day, covering them at high water, but leaving their surface quite bare at low water. The borders of these marshy creeks have never been considered unhealthy, unless where the free entrance of the tide has been obstructed by making streets or causeways across them. Where this has been done, the immediate neighborhood has become subject to intermittent fevers. The surface of the town as well as of the adjacent country is low and flat, being nowhere more than ten or twelve feet above the ^{level} ~~line~~ of the river. Near the wharves it is occasionally overflowed, when during an equinoctial gale the river rises a few feet above its ordinary height. The soil is alluvial, consisting of a stratum of clay from 3 to 6 feet thick, lying upon fine sand, beneath which, at a depth of from 20 to 30 feet, is a bed of marl of great thickness. The commercial part of the city lies between Main street on the north and the river on the south. It is from one to three hundred yards in width, and more than

half a mile in length. The wharves are mostly of wood, and intersected occasionally with docks, into which the tide flows freely. Most of the land south of Main street has been reclaimed from the river, the filling being made originally with pine saplings covered with earth. But as this was, for the most part, some fifty or sixty years ago, the land is now perfectly solid. The eastern half of the made ground, however, on which the famous Barry's row is situated, has been filled up within the last fifteen or twenty years. The streets are irregular and crooked, but almost universally paved and well drained, and are kept cleaner than in most towns of the same size. The well water is hard and unpleasant to the taste, containing both salt and lime, but for the last thirty years the inhabitants have used rain water caught in cisterns below ground. The climate, although variable, is very mild and agreeable throughout the year, the winters cold, being tempered by the nearness of the ocean, while the heat of summer is moderated by the sea breeze, which prevails with tolerable regularity in hot weather. Our climate is, therefore, several degrees warmer in winter and as much cooler in summer than that of inland towns in the same latitude. The summer nights are particularly pleasant, being rarely too warm for comfortable sleep after the hottest day.

Portsmouth lies southwest from Norfolk, on the opposite side of the river, which is here more than half a mile wide. Gosport is on the same side of the river as Portsmouth, but higher up and to the southward of it. Between the two places flows a marshy creek three or four hundred yards wide, which is crossed by a causeway and bridge. Gosport contains a population of five or six hundred, chiefly Irish laborers and their families, keepers of boarding-houses, &c. It has one principal street, Water street, which runs from the bridge to the navy yard gate, and several cross streets. Water street is parallel with the river, and about 80 or 100 yards distant from it. Between this street and the river is situated Page & Allen's ship yard, which merits a more par-

ticular description as the place where the first cases of fever occurred in 1855. It fronts on the river to the east several hundred feet, and extends westwardly to Water street, about three hundred feet. Near the river front is an old brick ware-house, now used as a work-shop and stable. The wharf is of wood, and old. Entering the yard from the river is a small dock, partially filled with mud, but still covered with salt water at every tide. Behind the ware house, between it and Water street, is another dock, partly filled with mud and timber, but also covered with water at high tide. On the Water street front are three or four wooden tenements occupied as boarding houses for workmen. The surface of the yard is covered with chips, but is clean and well drained. The whole place is open and ventilation unobstructed.

Portsmouth is a pretty town, laid out very regularly, with streets crossing each other at right angles. They are wide, but mostly unpaved and badly drained. The back of the town is somewhat cut up with marshes. Portsmouth has but little commerce, and consequently few ware-houses or ships at her wharves.

In climate and health the sister towns of Norfolk and Portsmouth differ but little if at all. The population of Norfolk in 1855 was about 16,000—that of Portsmouth, about 10,000—about one-fourth in both cities being black. Many years ago, Norfolk had the reputation, which was probably well merited, of being a very sickly place; but for the last 25 years, since it has been paved and drained, we think it has compared favorably with other towns of the same size, whether on our Atlantic coast or in the interior—the annual mortality being about $2\frac{1}{4}$ per cent.

In the winter we have the usual diseases of the season, as catarrh, pneumonia, &c. In the spring, vernal intermittents are met with, more or less every year, but the cases are neither numerous nor very grave, being rarely if ever fatal. Early in June dysentery begins to appear, and prevails more or less throughout this month and July. It sensibly di-

minishes by the beginning of August, and by the end of it, has usually ceased. It is seldom of a severe type, and not often fatal, except to teething infants. Cholera infantum also prevails during the hot months, but to a far less extent than it did 20 or 30 years ago.

In the latter part of August and September we again meet with intermittent and remittent fevers. These are usually of a mild type, rarely dangerous. The old fashioned bilious fever is seldom seen. The healthiness of our autumnal season is proved by the fact, that for the last 15 years the mortality of September has not exceeded the monthly average of the year. (Of course we except the yellow fever years.) October is a very healthy month, and November the healthiest of the year. The greatest mortality is in July; the next in June; then August—the deaths being principally of young children. The country around Norfolk is far more sickly than the town, being very subject to intermittent and remittent fevers and other malarious diseases. Within the city, the most thickly settled parts are the healthiest. Main and Water streets are remarkable for their exemption from intermittent fevers, and yet, as we will show, these are the streets that have been usually the seat of yellow fever.

The first epidemic of yellow fever in Norfolk, of which we have any account, was in 1795. After which, it prevailed more or less every year until 1805, with the exception of 1804, in which year there was but a single case. It was very bad in 1800 and 1803. The statement made by Dr. Archer, (Med. Recorder, vol. v.) that the yellow fever did not visit us after the great fire in February 1804 until 1821, is incorrect. There was no fever in 1804, but it reappeared in 1805 with considerable malignancy, as we find recorded in the note book of the late Dr. Wm. B. Selden. This fact we regard as of some importance, since its supposed disappearance after the destruction of the commercial part of the town by fire has been urged as a proof of its local origin in the preceding years.

After 1805, the disease was not seen in Norfolk until 1821, a period of sixteen years. An account of this epidemic was published in vol. v, *Med. Rec.* by Dr. Robert Archer, health officer of the port for that year. From his account we make the following extracts :

On the 20th of July a vessel, from Point Peter, Guadaloupe, laden with rum, sugar and molasses, arrived in the harbor. Having discharged her cargo at an upper wharf, her bilge water was pumped out in the dock between Southgate's and Warren's wharves, which was found to be so putrid and offensive as to render it expedient that the doors and windows of a neighboring house should be closed in order to exclude the effluvia arising from it. This and Southgate's ware-house were about equally distant from the vessel, say about 15 or 20 yards—one on the east, the other on the west side of the dock. On the 1st August Mr. Price,* acting as clerk in the ware-house, was taken sick with fever, strongly marked with symptoms of malignancy, and died on the —. On the same day a negro woman, cook to the family, occupying the other house, was attacked, and died on the 9th. On the 4th two ladies of the family sickened, the elder of whom died on the 10th. About the same time a boy aged 16 and an infant in the same family were attacked, but both recovered. On the 9th the lady of the house had a slight attack, from which she soon recovered ; and the only one who escaped of the whole family, seven in number, was the master of the house, whose duties fortunately took him from home at the time the bilge water was discharged. Young Piercy, who had assisted in pumping out the vessel, and a boy by the name of Andrews, who had frequently been about her at the same time, both sickened and died—one about the 15th day of the disease ; the other within 48 hours after the attack. It is evident, therefore, that the effluvia arising from the bilge water was the immediate cause of disease in every instance that has been recorded ; for every individual had been exposed to its influence, and almost every one who had come within its atmosphere was more or less affected by it.

The disease continued to spread from this time and from this centre. Dr. Archer further on says :

* Price slept at the ware-house. He was taken sick on the 31st July, and died on the 16th August.—*Note Book of Dr. W. B. Selden.*

I do not wish to be understood as subscribing to the doctrine of contagion and importation of disease, as generally implied, when I say that the vessel from Guadaloupe had some agency in its production in the present instance. A foul air generated on shipboard and one brought from a foreign port are two distinct things; but that bilge water, vegetable and perhaps animal matter and the like, whether of foreign or local origin, under certain circumstances of atmosphere, temperature, &c. are capable of engendering disease, no one, I am persuaded, is prepared to deny.

It is obvious, from these extracts, that Dr. Archer, while clearly ascribing the first outbreak of the yellow fever to the foul bilge water pumped out by the vessel from Guadaloupe, had no suspicion that she had had cases of fever on board, or was from a port where the fever was prevailing at the time of her departure. Her bilge water was, in his eyes, simply foul bilge water—not bilge water from a yellow fever ship, containing the imported germs of yellow fever. By rare good fortune we have been enabled to obtain further and more accurate information concerning this vessel, and to supply, after the lapse of 35 years, facts which had altogether escaped the vigilance of Dr. Archer, and which place the connection between the yellow fever of 1821 and the vessel from Guadaloupe in a new and much stronger light. Having heard from Capt. Arthur Sinclair of the United States navy, that there was a man, now a pensioner in the Naval asylum at Philadelphia, whom he had known as quarter gunner in the navy, of steady, sober and reliable character, and who had been a sailor on board the vessel which brought the fever to Norfolk in 1821, we wrote to Dr. Jas. Green, surgeon of the asylum, requesting him to learn from the man himself what were the facts of the case. Dr. Green, in reply, enclosed us the following statement from Wm. Douglass, the man in question :

The schooner *George Armistead*, Capt. McNeil, sailed from Point Peter, Guadaloupe, with a crew of 6 or 7 men, all told, in the beginning of July 1821; two men sick all the passage. Arrived in Hampton Roads, the supercargo, Mr.

Fowler, went ashore and up to Norfolk before the vessel was boarded by the health officer. In the evening of the same day one of the men died, and after dark we took him ashore and buried him at Sewall's point. Came on board at 10 o'clock, and another was dead; got the body into the long boat, and veered it one cable length astern, to be clear of the smell; went ashore with it, and buried it near the other. The same day the vessel went up, and on the way was boarded by an officer, who enquired of the captain whether we had had any deaths on board, and the health of the place we left. The captain's answer was, that one man fell from the mast head and was killed, and that he had traded to Point Peter several voyages, and never saw it healthier than when he left. Which was not true, for I was sick myself, and in the hospital at Point Peter. The harbor-master, Mr. Roberts, came on board, and received from the captain some pine apples and other fruit. All was right with the vessel. Went ashore to board in Woodside's lane, and another of the crew died that night, and several men in the house sickened that night, and never recovered; and in a few days the landlord died, and some of the harbor-master's family—the pine apple man. Dr. Archer was then in Norfolk. The merchant's name to whom the vessel was consigned I do not recollect, nor the wharf she laid at, as I went to Hampton in a pilot boat schooner going to Charleston, as there was something said about burning the George Armistead—made my escape and left my wages behind.

WILLIAM DOUGLASS.

Naval Asylum, Philad. August 14, 1856.

The above letter seems to establish the fact that there had been sickness and deaths on board the George Armistead before her arrival, and that the agency of this vessel in causing the outbreak of the yellow fever, was probably owing to something more than the *foulness* of her bilge water. There can be no doubt that the George Armistead was the vessel mentioned by Dr. Archer, although in his account he omits her name; for on reference to the newspapers of the day, we find that the George Armistead arrived at Norfolk on the 20th July, and was the only vessel that arrived from Point Petre during the season. Douglass is in error in supposing that cases of fever occurred in Nor-

folk the night after the arrival of the vessel; for Dr. Archer's account shows that it was on the 11th day after her arrival that the first case occurred. The name of the harbor-master whose family died in Woodside's lane, was Dunstan. Roberts was also a harbor-master at that time, but did not live in Woodside's lane, nor did he lose any of his family by the fever. He also informs us that it was Dunstan and not he who brought up the vessel. Notwithstanding these slight inaccuracies, we think that Douglass can hardly be mistaken in the important fact that two of his shipmates had died on board, and been buried on Sewall's Point, and that ^{these} ~~three~~ deaths had been concealed from the health officer.

We have been thus minute in our account of the origin of the fever of 1821, because each epidemic may serve to throw light upon the origin of subsequent ones; and as will appear hereafter, there is a striking similarity between the history of the George Armistead and that of the Ben Franklin. It is also of consequence to establish the correct history of this epidemic, in as much as it has been cited as an instance of the local origin of yellow fever in our city.

Dr. La Roche, in his recent very learned and elaborate work on yellow fever, (vol. ii, p. 379,) quotes from Dr. Archer's account of this epidemic, the made ground, narrow lanes, filthy docks and crowded Irish population, in proof of the local origin of the fever, and yet, by a singular oversight, omits all mention of the vessel from Guadalupe, to whose bilge water, discharged into this very dock, Dr. Archer, on the same page, ascribes the origin of the disease.

During the next five years our town enjoyed a complete exemption from yellow fever. But in 1826 it again made its appearance, beginning about the 1st September, in the same neighborhood as in 1821, and continuing until frost. Of this epidemic we can find no published account; but we have been told, by persons living here at the time, that it was attributed by the public to a vessel that discharged a cargo of damaged coffee in the neighborhood. It was less

general and less malignant than that of 1821, and like it, was confined to the limited space between Main street and the river. The greater part of the city, viz: all that lying to the north of Main street and east of Market square, was so entirely free from it, that no person who had not visited the infected district was attacked with the disease.

From this period until 1852 we had again a long immunity from pestilence. During these 26 years we are well assured that not a case of yellow fever was seen in the town, except a pilot who contracted the disease on board a vessel from the south, and two officers of the United States ship *Vandalia*, who were taken sick after landing from that ship in 1848. Indeed, so long and so complete had been our exemption from the disease, that there was not in the city a single practitioner of medicine who had ever treated a case of it. Our whole community had long lost all dread of it, believing it almost impossible that the disease could ever appear among us again. While in this state of security, in the midst of a season remarkably cool and healthy, we were startled by the discovery of some very suspicious cases about the middle of September, and in a few days had acquired the certain conviction that the yellow fever was epidemic in the lower part of the town. Fortunately, the weather was most unseasonably cool, and the disease made but little progress, although it continued to prevail until frost. The cases were not so numerous as in 1821 and 1826, yet the infected atmosphere was diffused over a wider space, extending much further to the eastward up Main street, and a few scattered cases, which could not be clearly traced to the infected district, occurring to the north of Main street, which had been its limit in former epidemics.

The general character of this epidemic was mild, a very large proportion of the cases being slight. The severer cases, however, differed in no respect from those with which we became so familiar in 1855, the fatal ones being usually attended with hemorrhages and suppression of urine. From the best information we could obtain at the time, the deaths

were probably from 50 to 100. The cases amounted to several hundred. More than six weeks after its commencement in Norfolk, the disease showed itself in Portsmouth, and was fatal in four cases, as we find recorded in the Report of the Portsmouth Relief Association, p. 92, by Dr. Schoolfield, who nowhere makes the slightest allusion to the existence of fever in Norfolk, although it had been epidemic in the lower part of the latter town for several weeks.

Some of your committee, who were in Norfolk at the time, took great pains, during the prevalence of the epidemic, and immediately afterwards, to trace the disease back to its source, and were well satisfied that it had existed and proved fatal in many instances for several weeks before its true character was suspected. The first probable case was that of Sally Fisher, a white girl from the Eastern Shore of Virginia, who had been living for some months in Somers' row, near the western extremity of Water street. This girl died on the 7th or 8th of August, (she was buried on the 8th,) after an illness of 4 or 5 days. Before death she threw up a large quantity of black fluid, and turned very yellow, as we were assured by one who saw her. Unfortunately, she was not seen by any physician, so that we could not obtain a professional history of the case; but that she died after 4 or 5 days' illness, deeply jaundiced, and throwing up black matter, is attested by a credible witness, who gave this account of her case before the existence of yellow fever was suspected among us. Indeed, so little suspicion had the girl's friends of yellow fever, that they inferred from the black vomiting and yellow skin that she must have been poisoned. From this time deaths continued to occur every few days in Somers' row, which consists of six small tenements. It soon crossed the street obliquely to the block between Fayette street and the Bethel church, and gradually spread over the whole of the lower part of the town. Somers' row is occupied by very decent persons, and is situated in a very open and well ventilated district. In front of it is a large open lot extending to Main street. To

the east is a large lumber yard, which is kept very clean. To the south and west are a few ware-houses. The streets are paved, and the population sparse. It would be difficult to point to any local cause of disease in the neighborhood, which is ordinarily perhaps the healthiest in the town, unless possibly a shooK factory some 300 or 400 yards to the north-west of Somers' row. This factory is built in the river, and is surrounded by water. Such of the shavings as are not consumed in heating the boiler, are thrown into a shallow part of the river or dock, where they have been accumulating for some years, but are daily covered by the tide. There are several houses on Main street much nearer to this factory than Somers' row, but the disease did not reach there for several weeks after its commencement in the row. It was our opinion at the time that the shavings had no agency in producing the disease. We ascertained further that 18 days before Sally Fisher died, and 13 before she was taken sick, viz: on the 20th of July, the Spanish barque Tascio arrived from Hanava, where the yellow fever, as is well known, was very prevalent and malignant at the time of her departure. This vessel was not visited by the health officer; for our long exemption from yellow fever had rendered us very careless about quarantine, but came up at once to the city and discharged her cargo, and pumped out her bilge water at the tobacco ware-house wharf. On her arrival two of her crew (Spaniards) were sick, and were visited by a practitioner of homœopathy, not educated as a physician. He pronounced their disease typhus or typhoid fever. One of the men died—the other recovered. As the ship was just from Havana, where typhoid fever must be very rare, if indeed it exist at all, but where yellow fever was then very prevalent, it is far more probable that these were cases of yellow fever. Somers' row is about 100 yards east of the wharf where the ship lay, with no intervening dwelling houses.

We are strongly inclined to the belief that the disease of this year was introduced by the above ship Tascio. We are

strengthened in this opinion by a consideration of the very cool and healthy character of the season, and the absence of any apparent local cause of disease in the clean, sparsely peopled and well ventilated district where the disease first showed itself. We are fully aware that the evidence of the existence of fever on board the Tascio is only presumptive, and that we have, therefore, no right to ascribe the introduction of the disease to her; but we think it would be even more illogical to attribute its origin to local causes which were not visible, merely because the proof that it was introduced from abroad, does not amount to mathematical demonstration.

In 1853 there was no case of fever in the town. In 1854 there were three cases of fever in Norfolk, all fatal. The first a woman, who died in Barraud's court in October; the second a woman in Barry's row, also in October. The third a man, who died 2nd of November in Water street, near Barry's row. During this season four cases occurred on the opposite side of the river, in the country, at the mouth of Scott's creek, as related by Dr. Schoolfield, who attributes them to some glass jars that floated ashore from the French steamer Chimere, which had been lying for many weeks with very malignant yellow fever on board, at about the distance of a mile from Scott's creek. There were also in quarantine at the same time, two merchant ships from New Orleans, the Ashland and Osterveldt, which had put into this port in distress. These vessels were laden with cotton and corn, and were allowed to discharge at Ferguson's wharf at Fort Norfolk, about three-quarters of a mile from the town. The quarantine was not very rigid, extending only to the vessels, while the captains and crews were allowed free intercourse with the city, and workmen were permitted to go on board. One of these, a ship carpenter, took the fever, but recovered. We have not been able to trace any direct connection between the other cases of fever in Norfolk and these vessels.

The year 1855, which forms the more immediate subject

of this report, was not remarkable for any meteorological or other conditions foreshadowing the approach of the direful pestilence by which it has acquired so sad a celebrity. The winter was cold, dry and healthy. The spring too was very dry, and with the exception of April, cooler than usual. We can only estimate the influence of the weather in producing yellow fever, by carefully comparing the seasons in which the epidemic prevailed with those which were free from it. With this view we have compiled from the Army Meteorological Register, for which we are indebted to the courtesy of Surgeon General Lawson, the following tables, exhibiting the mean monthly temperature of the first nine months of the years 1826, 1852 and 1855, as well as the monthly mean of 30 years, from 1825 to 1854, and the quantity of rain which fell in each of the same months of the years 1852 and 1855, as well as the mean of 18 years.

This register was kept at Fortress Monroe, which is 12 miles north of Norfolk, and for the purpose of comparing different seasons, will answer as well as if kept in the city itself. We regret that we have no barometrical or hygrometrical observations to refer to, those kept at Old Point not being yet published.

Thermometer.

	January.	February.	March.	April.	May.	June.	July.	August.	September.
1826, . . .	43.55	48.23	54.87	56.63	71.57	78.02	79.98	79.33	76.51
1852, . . .	35.19	42.62	48.87	53.44	65.85	72.74	76.23	74.12	70.20
1855, . . .	43.48	36.79	44.	59.33	65.72	74.81	82.30	79.44	76.51
Mean of 30 years, . . .	36.54	41.67	48.29	56.17	66.14	74.22	78.28	77.25	72.08

Quantity of Rain.

	January.	February.	March.	April.	May.	June.	July.	August.	September.
1852, . . .	0.90	1.18	1.82	2.72	1.53	1.89	3.83	4.90	1.55
1855, . . .	1.60	0.40	2.00	0.45	2.10	3.80	1.65	1.80	3.30
Mean of 18 years, . . .	3.26	2.74	3.33	2.80	3.64	3.78	5.56	5.70	3.43

From the foregoing table it appears that 1826 and 1852, both fever years, were different in temperature. The first was a remarkably hot year, the mean temperature of every one of the first nine months being considerably above the mean of 30 years. On the other hand, 1852, the first fever year after 1826, was equally remarkable for its coolness, the mean being considerably below the average in every month from April to September.

In 1855 we find that January was very mild, February and March cold, April very warm, May cool, June a fraction above the average, while July, August and September were very hot months. Whatever influence the heat in July, August and September may have had in increasing the disease, it could have had none in causing its outbreak, since, as will appear hereafter, the first cases of fever occurred in June. The heat of June was not so unexampled as has been asserted, for the foregoing table shows that it was barely above an average; and on examining the table of 30 years, we find in 15 of them June was hotter than in 1855. In only one of these, viz: 1826, was there fever in Norfolk.

five The first ~~fever~~ months of 1855 appear from the foregoing table to have been very dry, while June was very wet. There seems to be some doubt about the accuracy of the rain gauge at Old Point during the last five years, as the annual quantity of rain is far below the average; and unfortunately we have no access to any other kept for a series of years in this neighborhood. We feel sure from our own recollection, however, that the spring was a remarkably dry one. June must surely have been very wet, since the rain gauge at Old Point, which is suspected of marking less than the true quantity of rain, yet shows more than an average. The early part of the year was very healthy. With the exception of scarlet fever, which prevailed in March and April, there was less sickness than usual. In June and July there was some dysentery, but we think less than in ordinary years; certainly much less than in the preceding year 1854. There were also in June and July a few cases of

typhoid fever—a disease which prevails more or less every year. We are satisfied, however, that up to the middle of July the year was one of more than average healthiness; nor were there any febrile or other diseases to show an unhealthy state of atmosphere, or make us suspect the approach of a great epidemic.

The condition of the city as regards cleanliness was not different from what it had usually been. The streets are generally kept cleaner than in most towns of the same size, but there was no doubt a great deal of dirt in the yards and houses of the lower classes.

The statements that have frequently been published of meat putrefying with unusual rapidity and the fruit mildewing and rotting on the trees, had certainly no foundation except in the distempered imagination of the writers. So far from it, the fruit was remarkably fine and perfect; and it was observed by the southern physicians, that they had rarely seen in Charleston or New Orleans figs so luscious and unblemished. Indeed, in the very height of the epidemic there was nothing that would have led a stranger to suspect that he was in the midst of pestilence, but for the frequent hearse hurrying at a trot through our deserted streets. The air was as balmy and pleasant and vegetation as healthy and luxuriant as in the most favored seasons.

On the 6th of June the steamer Ben Franklin, Capt. Byram, arrived in distress from St. Thomas. Having transferred her passengers, some 50 or 60 in number, to the Baltimore steam boat in the bay, the vessel came to anchor at the quarantine ground, about a mile below the city, where she was visited the next morning (7th) by Dr. Gordon, the health officer of the port. Dr. G. was told by the captain that both his passengers and crew had been perfectly healthy during the voyage of ten days, there having been no fever or other disease among them. He admitted that he had lost two men—the first a fireman, who died suddenly, as the captain supposed, from disease of the heart; for he had been well and at work a short time before his death;

had been taken suddenly with sharp pain in the left side, and great difficulty of breathing, and died in half an hour after his seizure. The other was a sailor, who took the place of the first in the fire room; and being unaccustomed to the work and heat, was overcome by it, and died apparently from exhaustion, after entering the capes, and was buried on shore near the quarantine ground. That neither of them had headache, fever or vomiting. Dr. Gordon found the rest of the crew healthy and the ship clean; but as the yellow fever was known to be prevailing at Saint Thomas when the steamer left, she was ordered to remain at quarantine, but the captain and crew were allowed to visit the city.

On the 18th of the month, Dr. Gordon again visited the vessel, at the request of the captain, who was anxious to be allowed to go up to the ship yard to repair. Dr. G. reported to the board of health the same afternoon, that he found the crew in good health, and was assured by the captain that none of them had been sick since his arrival, although some of them were new hands, shipped in place of others who had deserted. That he examined the ship thoroughly down to her water tanks. That she appeared to be clean and in good order, with no cargo and no ballast, except some iron cannons in her hold, a small supply of coal, and a few barrels of pork. That she was leaking so badly as to require constant pumping with the steam pump to keep her afloat, and consequently could have no foul bilge water.

Upon this report of the health officer, and after being assured by the captain that the ship only needed caulking and some repairs to her upper works, and that there was no occasion to break out her hold, which indeed was already empty, the board of health gave permission for the ship to go up to Page & Allen's yard at Gosport. Accordingly, she went up the next morning, the 19th of June, after having laid 13 days at quarantine. She remained at the yard until the 8th of July, during which time there were many workmen employed both on her outside and inside, in repairing

her hull and boilers. While here too, she was partly broken out, to get at the stepping of the mast.

On the 5th of July, a man from Richmond by the name of Carter, who had worked on her boiler on the 3rd, was taken sick and died on the fourth day, viz: July 8th, with unmistakable symptoms of yellow fever, so pronounced at the time by Drs. Williamson and Green of the navy, both very familiar with the disease, who were called to see him before death. This death caused a great panic in Portsmouth, and the ship was sent back to quarantine on the same day, the 8th of July.

Such is the history of the Ben Franklin, as it appeared at the time. Since the fever, we have taken great pains to get at all the facts relating to her, and submit the following account, which we believe to be substantially correct, although not supported by official or professional testimony.

The Ben Franklin, a large sea steamer, sailed from New York in the fall of 1854, upon some filibustering enterprise to Central or South America, after the failure of which, she went to St. Thomas, where she lay for many months. At this time the fever was very prevalent at St. Thomas. In the month of March, the United States frigate Columbia came thence to this port, in consequence of the fever having broken out among her crew. From the officers of this ship and various other sources we have understood that few if any vessels in the harbor escaped the disease. Capt. Wm. Philips of the barque Eliza of Baltimore, a very respectable ship-master and old trader to the West Indies, informed us that he was at St. Thomas in January 1855, and sailed from there February 5th; that there was at that time a great deal of fever among the shipping as well as in the town; that he had cases on board his own vessel, and thinks that nearly every vessel in the harbor had it; and that there had been 8 or 9 cases on board of the Ben Franklin, and several deaths, as he was told in St. Thomas by Capt. Howes, the master of a vessel acting as consort to the Franklin in the expedition to South America, who was cognizant of what hap-

pened on board of her. From the engineer of the Franklin, Mr. Jno. Bowen, we have received the following letters, proving the existence of the disease on board during the voyage. We publish the letters in full, leaving out only some prefatory matter having no relation to the subject in question.

KENSINGTON, July 28, 1856.

MR. A. B. WILLIMAN, M. D.—ESTEEMED SIR—*** I joined the ship in the island of Saint Thomas on the 26th of May 1855, at which time the fever was on the island. I had two firemen then on the ship. One was taken sick with the fever. I examined the man, and found he had the symptoms of yellow fever. I reported him to the captain, and he the captain requested me to give him some medicine, which I did. The medicine I gave him was 60 grains of calomel with a portion of jalap, which had the desired effect. He complained of pain in the head and also a pain in the small of the back. His tongue was completely coated with a dark brown crust. This case occurred two days before we sailed for the north. The next case was the boy in the engineer's mess room, three days out from Saint Thomas—the symptoms appearing the same—but he died and was consigned to the deep after three days' sickness. From that time till we passed Cape Hatteras nothing occurred, when another of the firemen was taken down and also died, and was buried in the port of Norfolk while we lay in quarantine. Therefore we had two deaths and one cure on the passage. This is a correct statement of the voyage from Saint Thomas. The number of cures and deaths after leaving quarantine, were 4 deaths, and cures 3.

Deaths—1 boiler maker, 1 engineer, 1 second mate, 1 fireman. Cures—3 firemen.

Your ob't servant,

JNO. BOWEN.

The second letter was in answer to one from Dr. Williman, the secretary of your committee, asking various questions for the sake of getting a more minute account of symptoms than was likely to be given by a person unaccustomed to draw up medical reports.

KENSINGTON, Aug. 10, 1856.

MR. A. B. WILLIMAN:—RESPECTED SIR—In compliance with your request as to the questions and answers, I take this favorable opportunity to state to you as follows:

The first question is, whether the yellow fever was prevalent in the island of Saint Thomas during the time the Ben Franklin was there?—I do certify it was.

The next question is, was there any sickness on board while there?—There was one fireman, who recovered two days after sailing.

The next question is, when was the first death?—That took place three days after we left the island. This was fever. The skin was yellow, with high stage of fever.

The next question is, when the next case took place? This was before we made Cape Henry. That body was buried on the shore while the ship lay in quarantine. There was no more sickness on board for several days while laying in quarantine, until the second officer took sick, went to the hospital and died.

My dear sir—I can assure you I was eye witness to all that I have stated, having been amongst it and examined every case which took place. And I must inform you that I have had the yellow fever myself in the island of Cuba in the year 1840; so that you are aware that by experience I must be acquainted with the symptoms of the disease. I must inform you at the same time, that there was no vomiting in any of the cases; therefore I cannot state any further than what I wrote in my last letter.

Your ob't servant,

JNO. BOWEN.

These letters from the chief engineer in the immediate charge of the men who were sick, although wanting in the detailed account of symptoms, which would have been more satisfactory, still leave little doubt that they were cases of yellow fever. The fever was prevalent in St Thomas. The men were taken with pain in the head and back and high fever, and two out of three died after three days' sickness, with yellow skins. What other tropical fever is there with these symptoms, and so rapidly fatal? Of the fourth man

who was taken sick in port and died in the hospital, we have a more detailed account by Dr. Upshur, which will appear in this report.

Bowen's opinion of the character of this fever is confirmed by the following letter from Capt. Saml. M. Travers of Baltimore, an old and respectable ship master, who was long a resident of Saint Thomas :

TAYLOR'S ISLAND, *Dorchester C'y, Md.*
Feb'y 12th, 1856.

A. B. WILLIMAN, ESQ. *Norfolk, Va.*—DEAR SIR—YOURS of January 18th has just come to hand. In answer to yours, I can only say that I was a passenger on board the Ben Franklin in June 1855. In regard to the fever, I can only say that on or about the 27th of May last we steamed from the island of Saint Thomas, West Indies. The island at that time was distressingly sickly with yellow fever. That at the time of our sailing there were no cases on board, but on the third or fourth day out, we lost one of our crew, and the day we arrived in Hampton Roads we lost another one. From a number of years' residence in the West Indies, and some slight knowledge of the tropical diseases, I should certainly pronounce both cases yellow fever of the worst type. At one time there was a number of the crew down from fever, but at no time any passenger on the voyage; which I attribute to all of us passengers being acclimated to the tropical climates.

I have the honor to remain
Yr. obe'dt servant,

SAML. M. TRAVERS.

The next evidence in relation to the fever on board the Franklin, we found in the hospital case book of the late Dr. George L. Upshur, physician at the time to the United States marine hospital in this port. This book contains the notes taken daily at the bed-side of the patients. It is written in pencil, and in the handwriting of Dr. Upshur himself.

June 21st.—James Palmer entered to-day, æt. 25; Mass.; single; very stout; is last from Saint Thomas in steamer Franklin, which has been quarantined for 12 days past with

the yellow fever on board. Seized Friday 15th with chill, followed by high fever, and accompanied by vomiting and purging. On the next day, being no better, took a dose of calomel and jalap, 5 grs. each, and repeated the dose the day following. From this time gives a very imperfect account of his condition. Came to the hospital at 8 o'clock P. M. and was visited half an hour afterwards. Decubitus on the back; countenance distressed; breathing panting, oppressed, 36; eyes heavy and somewhat injected; head and limbs ache intensely; bowels moved three times, stools being small and painful; nausea and vomiting; thirsty; skin natural; pulse soft, full, 96; tongue red, sleek and clean; tenderness on pressure at umbilical region; sounds of heart natural; no cough. R. Emp. canth. 4 by 6 to abdomen. R. Quin. sulph. grs. xx; morph. sulph. grs. ss, pil. 4. Give two at once, and the other two early in the morning.

22nd.—Palmer died at 2 A. M. this morning very suddenly, having vomited a large quantity of black fluid (black vomit).

Mr. Robert S. Bernard, resident student in the hospital, gave the following further details concerning Palmer's death to Drs. Moore and Williman, who took this note at the time, (December 4, 1855:)

Between 7 and 8 o'clock A. M. (22d,) I saw Jas. Palmer's body. Had been raving all night with delirium, occasional vomiting of dark blackish fluid, in considerable quantities. Saw a pint of the fluid; whole surface of a dark yellow, deeper in tint than a lemon; eyes closed; the face and breast of a deeper tinge than the other parts of the body.

That this was a case of yellow fever, can admit of no question. We know that it was so considered at the time by Dr. Upshur, whose competency to diagnose yellow fever no one who knew him can doubt; and the description of symptoms and appearance after death must satisfy all who are familiar with the disease, of its true character.

It thus appears that the Ben Franklin had at least three cases of fever on board, two of which proved fatal before her arrival at Norfolk, and that a fourth case occurred on the 15th, while she lay at quarantine. This case (Palmer's) is the one mentioned by Mr. Bowen, who says, "that while

at quarantine the second officer took sick, went to the hospital and died." It had existed for three days when Dr. Gordon made his second visit to the ship on the 18th, and must have been carefully concealed from his observation. This man, although very ill, was not visited by any physician, but kept on board, under the care of the captain, nearly three days, at the ship yard, amid all the noise and confusion occasioned by the work going on—and was at last, when in a dying condition, sent to the hospital after sunset, when the hands had all left the yard. Is it not evident that the captain concealed this man as long as he had a hope of his recovery, and at last sent him to the hospital only to prevent his dying on board, and thus subjecting the ship to be sent back to quarantine?

This was evidently the first case of fever occurring in the port this summer, and proves conclusively that there was fever on board the Ben Franklin at the time she went to Gosport. It has been very strangely overlooked or omitted by Dr. Schoolfield, in his account of the fever, published in the report of the Portsmouth relief association.

The belief, which is entertained by some medical men at the north, that the fever existed in Norfolk before the arrival of the Ben Franklin, seems to rest upon no other foundation than a statement made by Dr. Stone of New Orleans, in an account of the yellow fever of Norfolk, which he gave to the New York medical society in the fall of 1855. Dr. Stone is reported to have said that during his visit to Norfolk in August 1855, he had been told by Dr. Upshur that he had had many or some cases of yellow fever before the arrival of the Ben Franklin in our harbor. It is probable that Dr. Stone may have heard Dr. Upshur say that he had seen the fever before the arrival of the Ben Franklin, alluding to the cases that he saw in 1852 and 1854. But we think it almost impossible that he could have told Dr. Stone that he had seen cases in 1855, before the arrival of the Ben Franklin, for his hospital book shows that Palmer's case, on the 21st of June, was the first case in the hospital; and his

report to the board of health of Norfolk dates his first case in town (Mrs. Cusack) on the 16th day of July, (five weeks after the arrival of the Ben Franklin.) Besides, none of his medical friends who were in habits of daily intercourse with him, nor his associate in practice, who has possession of his visiting list, ever heard him speak of any case of fever, or even resembling fever, before the cases above mentioned.

The next case of fever recorded in Dr. Upshur's hospital book, is the following:

July 5.—Francis R. Jones entered to-day, ^{act} Oct. 24; N. J.; single; previously healthy; from the steamer Franklin, which has lost recently some men with yellow fever. Palmer, whose case is recorded, p. 372, was from this steamer. This case has only been attached to the vessel one week. Seized on the 30th, with headache, backache and fever, accompanied by nausea and vomiting. The fever continued to be high until next afternoon, when it subsided. There has been but little alteration in his condition since. Has taken purgative pill 3 or 4 times; skin and conjunctiva very yellow; countenance natural; head aches a little; no backache; great tenderness on pressure at epigastrium; no nausea; some thirst; hoarseness; spits a little dark blood when he coughs; pulse soft, 84; tongue clean, sleek and dry. 12 oz. blood by cups from epigastrium. Tinct. mur. ferr. gtt. 30, 3 times a day.

Jones lingered until the 17th, with occasional appearance of improvement. He had, for some days before death, hemorrhage from nose and mouth, black vomit, phlyctenæ on limbs and forehead, and passed little or no urine.

Dr. Upshur is probably mistaken in the date of Jones' attack, which he got from the patient himself; for Dr. Jas. G. Hodges of Portsmouth, who reports the same case to the committee, saw him in Gosport on the afternoon of July 3, "with high fever, severe pain in the head and back, face flushed, eyes injected, hurried respiration and distressing nausea. Was told by patient that he had slight chill early that morning. He also stated that he had gone from New York to Saint Thomas for the purpose of joining the vessel,

but as she had left that port before his arrival, he took passage and sailed same day for Baltimore; had been attached to the steamer about one week when taken sick. Dr. Hodges regarded the case as yellow fever, and sent him to the hospital on the 5th.

On the 5th of July also, James Courtright entered from the same vessel; had been attached to her a week; was taken sick on the 30th of June. This was a well marked and severe case of yellow fever, but ultimately recovered.

After the ship had been sent back to quarantine from Gosport, several other cases of fever were sent up from her to the marine hospital, viz: Leary on the 19th July, and Humphreys and Malone on the 20th. Humphreys died on the 24th with jaundice, suppression of urine for 48 hours, convulsions, &c. The other two recovered.

While the Ben Franklin was lying in quarantine, late in July, two negroes, Elvy Trotter and Noah Wilkins, who had not been to Norfolk or Portsmouth, passed a night on board. Two days afterwards they were both taken with yellow fever, and died on the 7th day. This fact is recorded by Dr. Schoolfield in his Portsmouth Report. It thus appears that the Ben Franklin had cases of fever on board at Saint Thomas, during the voyage to Norfolk, while detained at quarantine, also while lying at the ship yard in Gosport, and after her return to quarantine, clearly showing that she was deeply infected.

Dr. Schoolfield (vid. Portsmouth report) saw on the 24th of June Mrs. Fox sick with yellow fever at the mouth of Scott's creek. This place is in the country, on the river shore, below Portsmouth, and fully a mile and a half from Gosport. Dr. Schoolfield ascribes this case to the malaria arising from the marshy shores of a creek on which the house was situated, and decaying cucumbers in the field near the house. While agreeing with the doctor that this was a genuine case of yellow fever, we do not admit his explanation of its occurrence. If marsh malaria were capable of producing yellow fever in country places, we ought to

see hundreds, or rather thousands of cases every year in lower Virginia, which is every where intersected with marshes both salt and fresh. Universal experience attests that the disease is unknown in the country in this neighborhood. There must, therefore, be some other cause than marsh effluvia to account for Mrs. Fox's case. Now, we find that the Ben Franklin, with yellow fever on board, was lying at the distance of a mile or less from her house for nearly a fortnight before she was taken sick, and five days before her attack, the ship, on her way up to Gosport, passed within one-third of a mile or less from her house. We contend that it is far more probable that this lady was made sick by the infected air from the ship blown ashore by the wind, than that she took yellow fever in the country without any cause whatever, except such as ordinarily produces intermittent fever, but was never known before to cause yellow fever. We must also remember that yellow fever appeared in this house in 1854, when it was traced to the Chimere, then at the quarantine ground. (Vide Schoolfield's report.) It is fair to presume that the Ben Franklin lying at the same spot, caused the recurrence of the disease in 1855.

This view of the origin of Mrs. Fox's attack is confirmed by similar occurrences in 1856, in the harbor of New York, where the disease was manifestly blown to the Long island shore in the neighborhood of Fort Hamilton, from yellow fever ships lying in quarantine, at a distance of some hundred yards.

The next cases of which we have any account, occurred in the practice of the late Dr. Trugien. These cases are, without doubt, the first that took place in Gosport, on shore. They were visited by Dr. Trugien on the 30th of June, and were taken sick either on that or the day before. Their names were Mrs. Brown, Eugene Riley and Robert Webb. They all lived in the same house, which is situated in Page & Allen's yard, and fronts on Water street. This house is the nearest tenement to the berth of the Ben Franklin, and is about 100 yards from it in a westerly direction. It is

probable that they had not been on board the ship. They were attacked just 10 or 11 days after the arrival of the Ben Franklin at the wharf.

On the same day that Trugien's cases were taken sick on shore, one or two cases occurred among the crew of the Franklin (Courtright and Jones,) as already mentioned. On the 5th, Carter, a workman on board the steamer, was taken, and died on the 8th. John Cooke died on the 10th, and Mrs. Palmer on the 11th, both in Irish row on Water street, directly opposite to the house in which Dr. Trugien's first cases lived.

From this time the disease continued to spread in Gosport, steadily and rapidly, in all directions. By the 1st of August it had reached the house of Capt. Barron, at the navy yard, about 500 to 600 yards southwest from the ship; and at the same time it appeared in the southern part of Portsmouth, about as far from the ship yard to the north.

During this time, and up to the middle of July, Norfolk, on the opposite shore of the river, continued remarkably healthy. The first knowledge that we had of the existence of the disease among us, was from a report made to the board of health by the late Dr. Geo. L. Upshur, on the 30th of July. In this report he stated that he had had, up to that date, 16 cases of fever, all in Barry's row. The first case was that of Mrs. Cusack, who was taken sick on the 16th day of July, in the same house in which her daughter had died of the fever in 1854, under the care of Dr. Higgins. Mrs. Cusack had not been to Gosport, nor indeed out of her house for several weeks, being an invalid and unable to go out. She recovered, as did most of the earlier cases, the first death being on the 29th, the day before Dr. Upshur made his report. Before Mrs. Cusack's case, there were two deaths in Norfolk, which require some notice, as they have been supposed by some to have been from yellow fever.

An Irishman, named Montgomery, died on the 2d day of July in Barry's row, after so short an illness that a coroner's inquest was held over his body. He was a sea-faring man,

of very dissipated habits. A few days before his death he had been on a frolic and drinking to great excess, and died two or three days after taking to his bed. The late Dr. Constable, who attended the inquest, afterwards remarked to a friend, that from the yellowness of the skin and some suspicious looking dark matter on the floor, he should have suspected that his death had been owing to yellow fever, if that disease had been prevailing at the time. No physician saw him during life, and we have been unable to learn any thing of his symptoms.

The other case was a child, Horatio Williams, æt. seven years, son of Mrs. Phœbe Williams, corner of Main and Fayette streets. He was taken sick on the 24th or 25th of June, with sore throat and fever. Visited on 27th by Dr. Selden. He had well marked diphtherite covering the pharynx and tonsils, with an acrid discharge from the nostrils, and some fever. The fever ceased on the 28th; the diphtherite disappeared the next day; and on the 30th he seemed perfectly well, with the exception of a slight excoriation of the nose from the acrid discharge. He had no fever, a good appetite, and was running about, apparently free from all disease. Discharged.

On the 1st July was taken, at 4 P. M. with fever, with some headache and drowsiness. The fever continued, with increasing drowsiness, until 2 A. M. of the 4th (58 hours) it ceased rather suddenly, leaving him with cool skin, slow pulse, and very prostrate. The drowsiness, instead of abating with the decline of fever, continued to increase, until by night it amounted to stupor, from which he could not be aroused. During the day there were frequent efforts to vomit, without, however, awaking from his sleep. At 10 P. M. vomited for the first time a little dark matter, the stain of which on the sheet was seen by Dr. S. It resembled the stain of black vomit. During the night he threw up large quantities of dark, half clotted blood, (so described by Mrs. W.) but which unfortunately was not preserved. Died, without delirium or convulsions, at 5 A. M. of the

5th. The body, examined by Dr. S. at 8, presented no yellowness of skin; and continued perfectly white up to the time of his interment.

This case certainly presented some very suspicious symptoms; yet, if it had occurred at any other time, it would probably have been considered as one of those unaccountable cases of blood poisoning, which are occasionally met with in all climates and at all seasons. Could there have been absorption of some acrid matter from the posterior nares, the seat of the diphtherite? An additional reason for thinking that this was not a case of yellow fever, is, that the child had a mild attack of the fever in 1852. But if it were yellow fever, it could hardly have been from any local cause—1st, because the neighborhood is remarkably clean, well drained and healthy; 2dly, because there was no other case of fever in that neighborhood until the 10th or 15th of August, five or six weeks after the child's death—and it is difficult to imagine that a poison arising from local causes could have been so limited in amount as to affect only one person and no other for six weeks afterwards. The Ben Franklin in quarantine lay about one mile from Mrs. W.'s house, and twelve days before the child was taken with the fatal fever and six before he was attacked with the diphtherite, passed on her way to Gosport within one-third of a mile from the house. Could a sufficient dose of yellow fever malaria have been blown ashore from her to affect this child? Perhaps future observations of similar cases may throw some light upon this.

We still think that the cases in Barry's row, beginning with Mrs. Cusack's on the 16th July, were the first cases of fever in Norfolk. There was a constant and daily succession of cases from the first; and from this centre the disease spread in all directions. Barry's row consisted of half a dozen or more three-story brick houses on the east side of Church, between Union and Water streets, occupied almost exclusively by Irish, who lived in the crowded and dirty state so common with persons of their class. The ground

upon which these buildings stood was formerly covered with water, and has been filled up within the last 12 or 15 years. The houses were badly built, and had settled a good deal, so that, after the street was paved, the basement floor was below the level of the side walk. In wet weather, the water under the floor rose up to and even above the planks, and mixing with the slops and dirt from the houses, furnished a suitable nidus for the origination or propagation of any pestilential disease. The lower end of the row is about 50 or 80 yards from the river. Page and Allen's yard lies southwest by south from it, and at the distance of 1.07 miles. It is worthy of note, that from the 19th June, the day on which the Ben Franklin arrived at Gosport, to July 15, the wind prevailed from the southwest 16 days, west 8 days, south 1 day, southeast 1 day, northwest 1 day, thus affording the fairest chance of the fever being blown from Gosport, if it be susceptible of being transported so far by the wind. At the time of the outbreak of the fever, it was attributed by public rumor, to the arrival of a number of Irish families from Gosport, who, panic stricken by the rapid spread and mortality of the pestilence in their own town, fled to their friends and countrymen in Barry's row, bringing with them their luggage and bedding. Although this may afford a very satisfactory explanation of the transfer of the disease to Norfolk, yet, after a diligent and protracted investigation of this point, we have been unable to obtain any evidence of the fact. On the contrary, we are satisfied, by the assurance of persons living in the row at the time, that no one moved over from Gosport until many days after the disease had already existed in the row, the first arrival being on the 23rd, 7 days after Mrs. Cusack was taken. We are also assured that none among the early cases, were persons who had been to Gosport.

While making these statements, and in order to omit no fact which may tend to throw light upon the origin of fever in Norfolk, it seems necessary that the following particulars should be here mentioned. During the whole period when

the Ben Franklin was lying at Gosport, a steam ferry boat (used as a conveyance for workmen belonging to the navy yard) continued to make two trips daily between the Seaboard and Roanoke rail road depot in Norfolk, and a wharf within the vicinity of 25 yards distance from the infected vessel, Franklin. Passing out of dock, where some 20 minutes' detention often occurred, the ferry boat crossed the river, and immediately discharged the workmen at their landing in Norfolk. This landing is situated about 150 yards from the centre of Barry's row, the street along which is itself a direct and common thoroughfare for passengers by the rail road ferry. It thus appears plain, that the ordinary modes of human intercourse between the neighborhood of the primary seat of yellow fever at Gosport and its subsequent place of invasion in Norfolk, were maintained without interruption for a length of time previous to the appearance of disease in Barry's row.

As soon as the disease was found to be in Barry's row, the board of health barricaded the streets leading to it, and forbade all intercourse; and as soon as the necessary arrangements could be made, removed all the inhabitants of the row, both sick and well, to temporary sheds erected beyond the limits of the city. A few days afterwards, viz: on the 9th of August, the entire block was burnt to the ground. Many persons were now flattered with the hope that the sick being removed and the focus of infection destroyed by fire, the disease would cease. A few days sufficed to show how delusive was this expectation. New cases immediately appeared in the same vicinity, and the pestilence advanced steadily in all directions; nor did it cease until it swept over the entire city. Its general progress was very steady and uniform. The epidemic wave, extending in a circle as the ripple from a stone thrown into the water, day by day invaded house after house, and street after street. To this uniformity of its advance there were a few exceptions, where the poisoned air seemed to shoot out from the general line of march, and overleaping the intermediate

space, would infect some particular spot several days before the intervening streets showed any cases. Thus several persons sickened in Queen street about the 10th of August, when the main body of the epidemic had scarcely passed Main street. Yet, on the whole its progress was very regular and uniform, being at the rate of 40 yards a day, or a mile in 5 or 6 weeks. Nor did the local conditions, which in ordinary seasons promote health or excite disease, seem to make any difference in the spread or malignancy of this epidemic. Those parts of the city which have always been regarded as the most healthy, and are occupied by the wealthier classes, suffered equally with the crowded, dirty, ill ventilated habitations of the poor. No where was the mortality greater than on Smith's point, which is sparsely peopled, and is as dry, clean and well ventilated as a country village or a gentleman's park. In this respect there was a striking difference between the fever of 1855 and all previous epidemics. In 1821, 1826, 1852, and we believe in the earlier epidemics also, the disease was very limited in extent, not passing to the north of Main street, which is only 2 or 3 hundred yards from the river. But in this memorable year, the disease kept its course steadily onward over the whole city, and even passed in some directions beyond the city limits, some distance into the country.

The disease seemed to extend more readily along the water, where there was nothing to obstruct its progress. The crew of the United States ship Pennsylvania, lying near to Gosport, after some cases of fever had appeared on board, were transferred to the Saint Lawrence, and dropped down to the bight of Craney Island, about 2 or 3 miles below Norfolk. Here new cases continued to occur for some days. After which, there was a complete cessation of the disease on board, no new cases appearing for 12 or 15 days.

When the disease in Norfolk had approached the northwest limits of the town, after the prevalence of the wind from the direction of Norfolk, several new cases occurred,

and curiously enough, among those who slept in the uncovered ports looking towards the city. This continued to be the case until near the close of the epidemic.

These interesting facts were furnished by Dr. Horwitz, U. S. navy, who was the medical officer on board.

Some cases also, it is alleged, occurred on Craney island, nearly four miles below the nearest part of Norfolk. A solitary case occurred at Old Point, 12 miles distant from Norfolk. Of its character there can be no doubt. The lady, Miss Taney, was seen by Dr. Jarvis, U. S. army, by Dr. Semple of Hampton, and Dr. St. Julien Ravenel of Charleston, who were all satisfied that it was an unmistakable case of yellow fever. She was taken sick on the 25th day of September, and died on the 30th with jaundice and coffee ground vomiting. But how can it be accounted for? Miss T. occupied a cottage near the beach, remote from all causes of a local character that could engender malaria of any kind. She had not been off the Point since the commencement of the epidemic in Norfolk, and had carefully avoided communication with persons coming from Norfolk or Portsmouth to the Point. A rigid quarantine had been kept up since the beginning of August, so that no vessel or boat came to Old Point from Norfolk. Could the poison have been blown from Norfolk, or floated down with the tide 12 miles, or was it a spontaneous case, originating where it is impossible to imagine a local cause? In the present state of our knowledge on the subject of yellow fever, it is not possible to solve this question. Perhaps it may be explained at a future day. The day after the death of Miss Taney, the weather became so cold as to render fires necessary. It was said that there was a slight frost in the neighborhood; but this is doubtful. The cold weather probably accounts for there being no other case at the Point.

The epidemic in Norfolk reached its acme about the last of August and continued without abatement until the middle of September. After this it gradually declined, probably from want of subjects, and was finally arrested by frost

and ice on the 26th day of October. After which no new case occurred among the returning fugitives.

It does not fall within the plan of this report to give the melancholy history of the ravages of the disease, nor to enter into a detail of its symptoms and treatment. It did not differ materially from the fever seen by us in 1852, and those described by our predecessors in previous epidemics, from 1795 to 1826, except in its greater malignancy and wider diffusion. In its symptoms it was much the same as all the great epidemics that have occurred either here or elsewhere; perhaps only suppression of urine was more common than had been previously observed.

We have no means of ascertaining correctly the number of cases. There were probably from 8 to 10,000; that is to say, nearly the whole population that remained in the city. Very few indeed escaped an attack, with the exception of those who had the disease before, either here or elsewhere. Of all those who had the disease in 1852, however slightly, we have not heard of a single one who was sick in 1855. Most of those who had had the fever in 1821 or 1826, escaped. Others had it mildly. We have heard of but two deaths of persons who had had the fever before, viz: Dr. Sylvester, who thought he had had it when a student in 1821 in this town, and Mr. Ignatius Higgins, who believed that he had had an attack in New Orleans some 15 or 16 years before. The blacks seemed equally as susceptible as the whites, scarcely any escaping an attack; but they bore the disease much better. Very few indeed of the pure blacks died—while the mulattoes suffered almost as much as the whites. The same susceptibility of the blacks to the yellow fever has been noticed in all former epidemics in this place.

The number of deaths was about 2,000, or one-fourth of the entire population remaining in the city. When we consider that half of this population was black, among whom there were few deaths, it seems probable that more than one-third of all the whites attacked, died.

In no case that we have known or heard of, was there

the least reason to suspect that the disease was contagious. Many hundreds of our people, flying from the pestilence, sickened and died, in the neighboring counties and cities, in hotels and private houses, in infirmaries and hospitals, under all possible varieties of place and circumstance, and yet we have not heard of a single instance in which it was even alleged that the disease was communicated to the attendants or friends.*

We have now given all the facts within our knowledge, which can serve to elucidate "the cause and origin of the yellow fever of 1855;" which was the question proposed to the committee by the councils. From these it will appear :

1. That the climate and situation of Norfolk cannot be very favorable to the development of yellow fever, in as much as, during a space of fifty years, viz: from 1805 to 1855, the disease appeared among us as an epidemic but three times, viz: in 1821, 1826 and 1852.

2. That the year 1855, previously to the outbreak of the fever, was not remarkable either for heat or moisture. The temperature of the winter and spring, except April, was below the average of 30 years. That of June was about the average, but was exceeded in heat by 15 Junes out of 30. That "the heavy rains of April and May, followed by a long drought," suggested in the Portsmouth report as the cause of the fever, did not exist. On the contrary, April and May were unusually dry, and June very wet.

3. That the city, if not in as good sanitary condition as could have been desired, was probably in as good order as most towns of the same size, and certainly as clean as it had been for the last 29 years, during which we had the fever but once. There had been no recent filling up, and no excavations for gas or water pipes, &c. During the progress of the epidemic, the cleanest, dryest and best ventilated places

* My own personal observation, which is on record in the Charleston Medical Journal, is not in accordance with this opinion, having seen reason to believe in a contagious property exhibited by the epidemic yellow fever which prevailed here in 1855. (See the remarks in May No. of the above Journal, 1856.)

enjoyed no greater exemption than the dirtiest and most crowded; which would not have been the case, if the disease were owing to the decomposition of animal and vegetable matter.

4. That during the first six months of the year the health of the town was very satisfactory. It was not merely as good as in preceding years, but we think better. In June and July there was much less dysentery, the most common disease of the season that we ordinarily meet with.

5. That in all previous epidemics the disease began in Norfolk, and only extended, after the lapse of many weeks, to Portsmouth and Gosport, where it prevailed to a much more limited extent than in Norfolk. This circumstance was probably owing to the fact, that all vessels from the West Indies come to Norfolk, and none to Portsmouth, which has had little or no commerce.

6. That in two of the three epidemics which have occurred in the last half century, viz: those of 1821 and 1852, the disease has been traced with great probability if not certainty, to vessels arriving from West India ports with fever on board. That of 1826, of which unfortunately we have no recorded history, was attributed by popular opinion to a similar source.

7. That the fever of 1855 began in Gosport, the first cases being on the 30th of June, in a house adjoining Page & Allen's ship yard, in a locality where there are no unusual elements of disease. The surface of the yard, it is true, was covered with chips, as is the case with all ship yards; but after a careful and minute personal examination of the premises, we have been unable to discover any obvious or probable cause of disease. The dock, which has been pointed out as the "*fons et origo mali*" the very focus from which the poison emanated, though partially filled with mud and logs of timber, is covered by salt water at high tide, and in our opinion is altogether inadequate to the production of disease of any kind. The marshes around Gosport, and which are not in the immediate vicinity of Page & Allen's yard, are in much the same condition as they have

always been—very unsightly when the tide is out, and giving rise, where partially obstructed, to intermittent and remittent fevers; but as they have never caused yellow fever before in the last 50 or 100 years, we are at a loss to understand how they could suddenly have acquired this new potency in 1855.

8. That on the 19th of June, eleven days before the first cases of fever were seen in Gosport, (it is worthy of note that this was about the time that has frequently been observed to intervene between the arrival of an infected vessel and the first cases of fever ashore,) the steamer Ben Franklin, from Saint Thomas, came up to Gosport, and was laid along side the wharf at Page & Allen's yard, at the distance of not more than 100 yards from the house in which the first cases occurred. That this ship had laid^{en} a long time in the harbor of Saint Thomas, where the fever was very prevalent. That she had probably lost several of her crew while there, and had certainly lost two men by fever on the voyage to this port. That, when after remaining 13 days in quarantine, she came up to Gosport, there was a severe and fatal case of fever (Palmer's) concealed on board of her. That while she lay at the yard three other cases occurred among those employed on board of her, viz: Courtright on the 30th of June, Jones on the same day or 3rd of July, and Carter on 5th of July. That cases continued to break out on board of her after she was sent back to quarantine, not only among her crew, but in two negroes who spent a night on board of her—thus showing that the vessel was infected.

9. That the fever began in Norfolk in Barry's row, on the 16th of July, just 17 days after its commencement in Gosport, 28 days after the Ben Franklin arrived at Page & Allen's yard, and 40 days after her arrival at quarantine. Barry's row is situated northeast by north from Page & Allen's yard, and is 1.07 miles distant from it, with only water intervening. That from the time of the arrival of the Ben Franklin at Gosport to the outbreak of the fever in

Barry's row, the wind prevailed almost constantly from the southwest. We have no evidence that the disease was conveyed to Norfolk in the baggage of fugitives from Gosport, as was currently reported at the time; but we incline to the opinion that the material cause of the disease was transported by the wind directly from Gosport or the Ben Franklin, and found a suitable nidus for its further development in the low, dirty habitations of Barry's row. That neither was the distance (1.07 miles) too great, nor the time (28 days) too short for this occurrence. In this opinion we have been strengthened by the fact that the next year (1856) the yellow fever was thus communicated from vessels at quarantine to the Long island shore in the neighborhood of Fort Hamilton, where, when once planted, it continued to spread until frost.

10. That the disease did not break out simultaneously in all parts of the city, as it would have done, if produced by a combination of terrene and meteorological causes, nor was it scattered about as if by accident, as is the case with diseases propagated by contagion; but starting from a central point, it advanced steadily and regularly in all directions, until arrested by frost—there being an interval of two months between its commencement in Barry's row and its appearance on the Princess Anne road, a distance of $1\frac{1}{2}$ mile, and more than three months from the first case in Gosport to the occurrence of the disease in the extreme limits of Norfolk. A similar mode of extension has never been observed in regard to remittent and intermittent fever, which are admitted to depend upon local and atmospheric causes.

11. The yellow fever north of the Gulf of Mexico is well known to be a disease of seaport towns only—never appearing in inland towns, unless previously existing in neighboring seaports. When it occurs in seaports, it very generally begins on the wharves in the neighborhood of shipping. We know of no causes, either local or meteorological, which are peculiar to seaport towns and the commercial parts of those seaports, and which are not equally found in inland

towns, except the presence of ships from foreign ports. Accordingly, the common sense of the people, regardless of professional dogmas and theories, has always ascribed the origin of the disease to importation in ships.

12. The fever in 1855 did not appear, in any case that came under our observation, to be communicated by contagion. Indeed, the great number of instances in which persons from Norfolk died with yellow fever in other places, without communicating the disease, proves, as far as negative testimony can prove any thing, that the disease is, decidedly, not contagious.

Finally. After a careful consideration of the foregoing facts, we are unanimously of the opinion that the yellow fever of 1855 was introduced by the steamer Ben Franklin from Saint Thomas, and that there is no reason to suppose that we should have been visited by the epidemic but for the arrival in our harbor of this or some other vessel with the fever on board.

In the present state of science, it is not possible to determine what is the material cause of yellow fever, in as much as it is not tangible, and cannot be subjected to examination and analysis. It is only by a careful process of induction from all the known facts in relation to the disease, that we can hope to arrive at a correct theory of its origin and propagation. The hypothesis, which best explains most of the known phenomena of the disease, is that its material cause is some organic matter endued with the property of rapid reproduction, either in a soil or atmosphere congenial to it, but not capable of being reproduced in the human body. That this matter, whether of animalcular or vegetable character, is a production of tropical regions, and is only spread in temperate climates, when introduced into them by ships.

As a necessary consequence of our opinions, we would advise the councils that, while they should pay the strictest attention to sanitary regulations, such as cleaning, draining, &c. with a view to diminish if possible the spread and malignancy of the disease in case it ~~yet~~ should unfortunately be introduced, ^{and} our chief reliance for escape from yellow

fever for the future must be in a rigid quarantine, at a safe distance, of all vessels arriving from suspected ports.

Which is respectfully submitted.

WILLIAM SELDEN, M. D.

ROBT. B. TUNSTALL, M. D.

WM. J. MOORE, M. D.

S. D. CAMPBELL, M. D.

ROBT. H. GORDON, M. D.

The foregoing report contains twelve propositions, beginning at p. 39, in the form of final conclusion to the previous written matter. As a member of the committee about to sign these propositions, I take this method of making the following remarks, in order to define correctly my own personal opinion :

The 9th paragraph (p. 41-2,) asserts a belief that the yellow fever poison was wafted by the wind from Gosport, and found a suitable nidus for its further development in the low and dirty habitations of Barry's row, Norfolk. I do not incline to this opinion, but think it more likely that either the ferry steamer (plying twice daily between the original seat of disease at Gosport and the vicinity of Barry's row) or the workmen on board of her acted as the communicating agent of disease.

My knowledge of the fever at Fort Hamilton in 1856 does not allow me to speak at all.

The 12th clause has another mention about contagion. I remark, as in a former place, that my observation favored an affirmative opinion for it. Again, I think that the cause of yellow fever is some minute material germ, capable of reproducing itself when given off from the human body suffering under this disease.

If hazarding any advice in addition to that given in the report, it would be plainly this—to remove all persons sick of yellow fever as far as possible from a crowded city population, and especially from that of the laboring Irish, who now abound in Norfolk.

A. B. WILLIMAN, M. D.

