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**‘Like a clap of thunder in a clear sky’: Differential Mortality
during Savannah’s Yellow Fever Epidemic of 1854**

In early September 1854 Rev. Mr Crumley, pastor of Savannah’s Methodist church wrote to the editor of the *Southern Christian Advocate* describing the city during the height of the yellow fever epidemic:

How changed is our beautiful, growing, healthy city, lately full of enterprise, noise and business. Now it is nearly depopulated. The long streets are empty, save a few sad processions which are seen silently hastening on – there a long train of mourners – here a lone hearse bearing the dead to the city of silence. And at eventide in the public squares, the pride and beauty of the city, in place of the gay groups that promenaded the snow white walks, and the merry children that romped upon the green grass, there is a tar-fire flaming in the centre, throwing a lurid glare on the surrounding trees, and spreading abroad a long train of pitchy smoke that covers the city like a mourning veil.ⁱ

By the end of November six hundred and fifty residents of Savannah had succumbed to yellow fever. On the worst days there were so many burials that even with ‘all the house carpenters in town’ making coffins they were unable to keep up with demand.ⁱⁱ Yellow Fever struck in many other locations in 1854 including Galveston, New

Orleans, Charleston, Houston, Augusta, Montgomery, and Vicksburg, but the mortality and suffering in Savannah was widely acknowledged to be ‘horrible in the extreme’ and ‘almost unparalleled’ in the history of the city.ⁱⁱⁱ The yellow fever virus attacks all within reach: it does not respect age, gender, or nativity. Individuals drawn from all sections of society contracted and died from yellow fever in Savannah in 1854 but the impact of the disease was far from uniform. Mortality was particularly acute among young adult male immigrants and this article seeks to explain why a social geography of vulnerability was operating in the city.^{iv}

Historians have, of course, studied the impact of yellow fever in the South before. Although northern cities had experienced yellow fever in the eighteenth century, most notably Philadelphia in 1793, by the nineteenth century the disease was widely understood to be peculiarly southern, and indeed some historians have suggested that improvements in public health were spurred in large part to tackle the impact of yellow fever.^v Scholarship has, unsurprisingly, concentrated on New Orleans, the South’s biggest city in the nineteenth century, where annual yellow fever outbreaks occurred with varying degrees of malignancy. The heavy death toll had a disproportionate impact on immigrants, often attributed by contemporaries to dissolute lifestyles.^{vi} Charleston has proved another popular subject for study, with one excellent recent study demonstrating how yellow fever was one of a number of diseases that ensured political power in the city was retained by a small local elite.^{vii} As will become clear, the models proposed by yellow fever historians for New Orleans and Charleston, where locally-born people often had immunity to yellow fever, do not fit well with Savannah. Yellow Fever in Savannah itself has received surprisingly little scholarly attention, and those that mention the 1854

epidemic almost universally cite erroneous statistics that conflate yellow fever deaths with all deaths, raising the death toll to more than a thousand.^{viii} A systematic analysis of the 1854 epidemic has never been done.

Yellow Fever is a particularly terrible and terrifying illness: apparently healthy people can sicken and die within forty-eight hours, while others can linger in agony for several days before dying, and even the majority who survive the virus can lie bed-ridden for up to two weeks wracked by high temperatures, chills, and migraines. Acute cases endure massive internal haemorrhaging that causes yellow fever's most distinctive symptom, the so-called 'black vomit' of blood that has collected in the stomach. Cases with this symptom nearly always terminated fatally. Yellow Fever is a very difficult disease to diagnose with certainty. The early symptoms of yellow fever, which include high fever, nausea, and headaches, are typical of many fevers and thus mild cases can easily be overlooked or ascribed to different illnesses. This was of course, even more likely in the nineteenth century when medical knowledge was limited and not everyone had access to medical help. Some cases could only be identified post mortem via examination of the liver. We have no way of knowing how many people were infected with yellow fever in Savannah, though contemporaries estimated that five thousand white people, the majority of those who remained in the city, fell sick. Using this estimate, the mortality rate in Savannah in 1854 (c.13%) was at the lower end of the range commonly observed in the twentieth century.^{ix}

This study is based on four different sources: the burial records of Laurel Grove cemetery and the city's Catholic cemetery; the minutes of Savannah's Board of Health; and published lists of the dead in the Savannah Morning News. These sources yield the

names of 650 people who died of yellow fever between early August and the end of November 1854.^x Some people contracted yellow fever in the city but died or were buried elsewhere – they are not included in this study because only limited information about them is known such as name and gender.^{xi} It is possible, perhaps even likely, that some of those who died of yellow fever but who did not develop the final tell-tale ‘black vomit’ symptom were officially recorded as dying of something else. It is also possible, but far less likely, that some recorded as dying of yellow fever actually succumbed to a different illness. In general the data has been taken at face value since Savannah’s doctors were familiar with yellow fever and knew to look for ‘black vomit’ both pre- and post-mortem. If physicians were unsure of the cause of death then autopsies were undertaken to examine the liver and the stomach because city authorities desired accurate data to see if the epidemic was waning. Thus, although there are some reservations about the data from these sources, the list of 650 victims of yellow fever has been taken the basis for the ensuing analysis. The mortality data provides an invaluable opportunity to analyse the factors that affected susceptibility to the disease since for virtually every victim we have name (and thus gender), age, and place of birth, while for a significant number we also have place of residence and name of doctor. Analysis of this data adds significantly to our understanding of the selective impact of the ‘saffron scourge’ in Savannah.

Yellow fever is a tropical disease, endemic in West Africa, the Caribbean and parts of Latin America. It is a virus that cannot be transmitted via normal human-to-human interaction but requires a vector, in this instance a mosquito. In the Americas the culprit is the female *Aedes Aegypti* mosquito. When the mosquito first bites an infected person between one and two weeks must elapse before the virus can be transmitted to a new

person.^{xii} While there are mosquitoes and fresh human victims, the cycle repeats itself but once there are no more susceptible humans or no mosquitoes, then the cycle is broken and the epidemic ends. In Savannah the mosquitoes would have been killed by first frosts that were reported on November 13, 1854, but even before then mortality had been declining for more than a month due to the reduced number of new victims, or ‘non-immunes’ that were available. It seems likely, based on contemporary estimates, that more than 80% of those infected with yellow fever during the 1854 epidemic recovered, and all of those people would have gained immunity from further infection as a result.^{xiii}

The mortality records from Savannah demonstrate that yellow fever affected certain segments of the population far more severely than others. It was, for instance, very evident at the time that black mortality was a mere fraction of white mortality. Slaves and free blacks constituted just under half of Savannah’s population yet only fourteen black people died of yellow fever prompting one doctor ‘to remark that the blacks formed the ‘privileged class’ among the inhabitants of the city.’^{xiv} Blacks were not immune from infection: Dr Richard Arnold noted at the end of September that ‘There has been a great deal of sickness amongst the negroes within the last three or four weeks, fortunately not nearly so fatal as amongst the whites.’^{xv} This observation fits with studies of yellow fever epidemics in the United States during the 1870s that demonstrated that whites and blacks had similar rates of morbidity but very different rates of mortality.^{xvi} Historians have debated the cause of this differential mortality rate with Kenneth Kiple in particular suggesting an as yet unidentified genetic protection possessed by people of West African descent.^{xvii} Contemporaries used the low rates of mortality among slaves as another justification for enslavement with one doctor commenting that ‘The epidemic has

convinced me how utterly impossible it is for the white race to do the outdoor work in this hot climate.^{xviii} A city census taken on October 2 counted 5,491 blacks in the city out of a pre-epidemic population of about seven thousand suggesting the *Savannah Republican's* claim that 'The black and colored classes have not certainly left the city in any very considerable numbers' was broadly accurate, particularly so when compared to the flight of white residents.^{xix} Many slave-owners left their valuable city homes 'in the charge of the servants,' trusting, rightly as it turned out, that yellow fever would not decimate their enslaved property. One planter admitted that most returning residents after the epidemic found their dwellings 'in the same condition he had left them ... a feature that showed our slaves in a favorable light.'^{xx} Savannah's black population faced the full onslaught of the epidemic but survived it largely unscathed.

Among whites it is immediately evident from the records that mortality from yellow fever among children was far lower than among adults. According to the 1850 census those under ten years old constituted 23% of the white population, but in 1854 they accounted for fewer than 7% of yellow fever deaths. As with many other diseases (for example chickenpox, mumps and rubella) childhood infections of yellow fever were more likely to be 'mild or asymptomatic' than for adults.^{xxi} Childhood mortality more generally was terrible in Savannah, as neonatal tetanus, various undifferentiated fevers, and bacteria all assaulted vulnerable immune systems. Many children probably contracted yellow fever but their immune responses meant they didn't often die of the disease. The group most vulnerable to the yellow fever virus were adults in their 20s. Mortality amongst this group was twice what might be expected had deaths been spread evenly.

Possible explanations for this high mortality among those in their 20s are inter-twined with other variables.

Another significant factor influencing mortality was gender. There is no known immunological reason why women were less likely to die of yellow fever than men, but female mortality was lower than male mortality across nearly all age groups.^{xxii} The most likely explanation for lower rates of mortality among women relates to the degree and extent of exposure to infected mosquitoes. The *Daily South Carolinian*, reporting on the situation in Savannah, had heard that ‘Many citizens, especially females, are leaving the city’, and if men prioritised the departure of their wives, and quite possibly their children as well, then this would help to explain the gender bias in the mortality records since there were simply fewer women resident in the city.^{xxiii} There is no way to prove this conclusively since the population counts undertaken during the epidemic only enumerated whole numbers of black and white people with no disaggregation by gender. Even among women who remained in the city it is likely that their risk of infection was lower than for men due to the peculiar manner that the disease was transmitted. The *aedes aegypti* mosquito is more active in the day than many other mosquitoes, and is drawn to exposed sweaty flesh.^{xxiv} Men were far more likely than women to be working outside during the day, and if engaged in manual labour in the heat of a Georgia summer were more likely to have stripped to the waist. An early fatality precisely fits this description. James Gallagher was a 21-year-old carpenter who ‘had been working on the roof of a house which was just finishing’ and furthermore he had ‘walked nearly a mile two or three times daily to and from his work, which was in the north-eastern portion of the city, through the broiling sun.’^{xxv} Gallagher was a highly attractive target for a mosquito and

of course repeated bites by infected mosquitoes would have delivered a high viral load that his immune system would have struggled to cope with. Women, by contrast, were generally not working outside and Victorian standards of female modesty required far more flesh to be covered up. Women were therefore less likely to be bitten, and if bitten received fewer bites and a smaller viral load. It is this that perhaps explains the survival of some women whose husbands died during the epidemic. Dr Charlton Wells and his wife both contracted yellow fever in early September 1854 but whereas he repeatedly risked re-infection as he traversed the city visiting patients, she stayed home. After Dr Wells's death on 12 September his wife was brought out of the city to stay with relatives in the country and by early October was reported as 'convalescing.'^{xxvi} The higher male death rates were therefore most likely because proportionately more men remained in the city during the epidemic and a large number of working men presented themselves as unprotected targets for mosquitoes.

Neither age nor gender attracted much contemporary comment as factors that affected mortality from yellow fever. By contrast birthplace was perhaps the most common variable pointed to by contemporaries that determined susceptibility to yellow fever. Throughout the South yellow fever was commonly referred to as the 'strangers' disease' due to its particular virulence among immigrants from Europe and the northern states.^{xxvii} Dr. John Monette's 1842 study of yellow fever concluded 'As a general rule, the natives of tropical cities seldom experience an attack of the disease; and even where it becomes epidemic among them, as it has been occasionally, it assumes such a mitigated form as to present entirely a different aspect from the same disease in strangers.'^{xxviii} The data from Savannah in 1854 seemingly supports this contention.

Place of Birth	No. of victims
Great Britain (excluding Ireland)	37
Ireland	293
Germany	79
Other Europe	26
Northern states including Canada	76
Southern states excluding Georgia	36
Georgia excluding Savannah	37
Savannah	55
Other	1
Unknown	10
Total	650

Fig. 1 Yellow Fever deaths by ethnicity.

Native-born southerners account for less than a fifth of deaths from yellow fever in 1854, whereas Britain and Ireland alone account for more than half, and Europeans in total account for nearly two-thirds. Admittedly Savannah was a polyglot society with foreign immigrants constituting about half of the adult white population, but even so the mortality amongst those not born in Savannah was disproportionate.^{xxix} Savannah had attracted economic migrants for decades but very few came direct from Europe, or via the Caribbean. Instead they first arrived in the major northern cities but ‘finding that the rewards for labor were small, and that the inducements presented in the Southern cities were stronger,’ they came South by ship.^{xxx}

European migrants arriving in Savannah were pitched into a completely alien disease environment since extremely few had travelled overland and built up any

resistance to the range of southern fevers. Contemporaries were well aware that ‘unseasoned’ immigrants should expect to contract the fevers that most commonly flared up in the summer and early autumn. ‘Remittant fever’, where fever comes and goes, was particularly widespread among immigrants and most likely a contemporary description for the another mosquito-borne infection - malaria. Those infected with the malaria parasite would have found it particularly difficult to fight off the yellow fever virus since it left the victim in a weakened state. Locally-born people who lived with such fevers all their lives had, by the time they reached adulthood, an immune system that was well adjusted to the environment. In the case of yellow fever, surviving a childhood infection granted life-long immunity. Contemporary physicians believed that protection from yellow fever ‘is most speedily and effectually wrought by the occurrence of the disease itself; but it is quite evident that it may be more slowly and gradually effected by a continued residence in yellow-fever regions.’^{xxxii} The former is true, the latter is not. Immigrants who had no prior exposure to yellow fever caught the disease as adults and as a result suffered high mortality. In nineteenth-century New Orleans annual yellow fever took a heavy toll among Irish and German immigrants but often by-passed those who had grown up in the city. This encouraged a view of yellow fever as less serious than other illnesses such as typhoid and for some locals it was a welcome guarantee against being overrun by foreigners.^{xxxiii} In Charleston, as Peter McCandless has recently demonstrated, an extensive commerce with yellow fever ports in the Caribbean such as Havana meant the disease occurred with sufficient frequency to ensure a high level of immunity among local residents.^{xxxiii}

Some native Savannahians believed themselves immune to yellow fever solely due to their birth and long residency in the South. One inhabitant in 1854 scoffed at ‘panic’ and ‘alarm among the old residents’ once yellow fever was confirmed in the city since the ‘many deaths and much sickness’ were confined to the eastern suburbs ‘among the European immigrants.’ The few cases among the established population could be explained either by foolish overexposure ‘to the scorching heat of the season’ or a ‘delicate’ constitution. He predicted:

The disease always begins in the Eastern part of the city, with those who do not enjoy the comforts of life, and who have no regard for cleanliness, and passes through the city from East to West, street [by] street, and so it will on this occasion, and is already doing. As it reaches the central parts of town, the disease will be less virulent, because there it will have for its subjects those who are more acclimated and enjoy more of the comforts of life – but when it gets into the Western wards of the city, it will again become more rife, have similar subjects as in the Eastern wards, unacclimated European emigrants, who live upon daily labor and have no idea of precaution against disease.^{xxxiv}

For this author mortality was largely, but not entirely, dependent on nativity. A secondary but important factor was class; those who had the time and money to enable them to pay more attention to personal hygiene would suffer less than those who resided in squalor, though it is noticeable that far less blame for the 1854 epidemic was placed on immigrants than in other cities.^{xxxv} A month later the *Savannah Republican*’s description

of the course of the epidemic closely matched this prophecy: ‘The sickness is limited mostly to the western and south-western wards, having slowly passed over to those portions of the city from the east, where it first appeared. It seems to reach back, however, as it were, and to claim here and there as its victims, persons in comfortable circumstances, who had for some time escaped. But with those scattering exceptions, it is confined principally to Yamacraw, Robertsville, and the vicinity of the Depot.’^{xxxvi} This confidence that yellow fever would normally ‘pass through the centre of the city, without destroying many of the natives and old inhabitants’ was for the most part based on an entirely false premise: that locals were generally immune to yellow fever.^{xxxvii} In reality they were nothing of the kind and this is why Savannah proves to be such an interesting case study since, unlike both New Orleans and Charleston, differential immunity was not a major consideration.^{xxxviii}

Local populations only gained immunity to yellow fever by growing up with the disease and contracting a mild infection as children. Yet yellow fever was clearly not endemic to Savannah since there were only four significant epidemic years ever the city: 1820, 1854, 1858 and 1876. In a small number of other years there were a few cases of yellow fever without an epidemic, but most years no yellow fever cases were recorded in the city. Lowcountry doctors realised that yellow fever was not endemic but they debated whether there was some combination of meteorological circumstances that led to the outbreak of an epidemic, or whether this ‘occasional visitor’ was introduced periodically either by ship from the Caribbean or by rail from the gulf coast.^{xxxix}

Some historians have suggested that yellow fever did not need to be introduced and could have been present on lowcountry plantations in a endemic form with slaves and

mosquitoes between them keeping the virus active each year. The disinterest of planters in the health of their slaves might explain why yellow fever cases were not remarked upon.^{x1} If this was the case then the introduction of the disease to the city requires little explanation: it would have been brought in by a slave visiting the city who was then bitten by an urban mosquito. Yet this argument is difficult to sustain. If yellow fever existed on nearby plantations it surely would have been introduced more regularly in epidemic form to Savannah. Rural slaves visited the city regularly, bringing home-grown produce for sale at the weekly market, thereby creating numerous opportunities to spread yellow fever. The fact that Dr Richard Arnold noted widespread sickness among Savannah's black population in September 1854 is further proof that yellow fever was not endemic in the city but needed to be introduced. If it had been endemic then slaves who were permanently resident in the city would have had a high rate of immunity from infection. Finally evidence from several lowcountry plantations suggests that planters actually took quite an active interest in the health of their slaves who were, ultimately, significant assets.^{xli} If yellow fever was rife on the plantations then despite the fact that mortality among slaves was low at least some would have died exhibiting the fatal 'black vomit.' Yet plantation journals from this period singly fail to mention such symptoms.

In regions such as Savannah where yellow fever was not endemic, epidemics only occurred when specific circumstances combined to make the environment favourable. The number of mosquitoes was dependent on temperature and rainfall – cool, dry years saw far fewer mosquitoes than hot, wet years. 1854 was a hot year, roughly five degrees F warmer than the previous five years, and it was also a wet year with more than seven inches of rain both May and July.^{xlii} Heat speeds up the mosquito breeding cycle, thus

leading to more mosquitoes, while plentiful pools of water provided a multitude of breeding locations. There would have been more mosquitoes in Savannah in the high summer of 1854 than normal, but this would not have mattered if the yellow fever had not been introduced somehow.^{xliii} The great tragedy of 1854 is that the virus was introduced in July, at the height of summer, which gave the disease three full months to run unchecked until the frosts. The weather for August and September remained very favourable to mosquitoes, the week beginning 21 August for instance saw more than two inches of rainfall, and a mean temperature of 89 degrees F. The week of 18 September also saw more than two inches of rain and a mean temperature of 79 degrees F. On average it rained every other day in August and September and a prolonged period of dry settled weather did not set in until October.^{xliv}

Since yellow fever was evidently not an annual visitor to Savannah there was little chance for locally-born residents to gain immunity via childhood infection. Before 1854 the last major epidemic to strike the city was in 1820. Those living in the city in 1820, especially if they were children, would have gained immunity to future epidemics so long as they survived the infection but the heaviest toll from yellow fever in 1854 occurred among those in their 20s, who had been born in the late 1820s or early 1830s. These people were born after the 1820 epidemic. There were a few cases of yellow fever in Savannah between 1820 and 1854 providing short windows of opportunity to gain future immunity. Fifteen people died in 1827 but the disease ‘did not prevail very extensively’ partly because it only broke out in September and thus ‘its mighty destroyer, frost, put an end to it before it had time to spread extensively.’ Dr Richard Arnold, attending physician at the city hospital, with the character of yellow fever ‘indelibly imprinted on my memory

from the experience of 1827' recalled that 'from 1830 up to 1839, I never saw a case of Yellow fever in the city.'^{xlvi} Two cases in 1839 involved patients recently arrived from Augusta and Charleston, and Arnold noted one case in 1840, two in 1841 and 'a few' in October 1842. No further cases occurred in the city until 1852. Twenty-five people died in 1852 but as in 1827 the first infection was not reported until late September and 'a frost early in November cut it short.'^{xlvi}

The sporadic incidence of yellow fever in Savannah between 1820 and 1854 provided nothing like sufficient exposure to provide widespread immunity for locally-born people. Twenty-five deaths from yellow fever in 1852 might suggest that about 200 people were infected with the disease, based on the mortality rate in 1854, meaning about 175 recovered and were thereafter immune. If that number is augmented by those who survived infections in 1820, or in 1827, then at most there were probably 500 immunes in Savannah in 1854, out of a total white population of roughly 15,000.^{xlvi} Locally-born citizens who stayed in the city throughout the epidemic were clearly taking a big risk since the disease 'had but little respect to the mode of living' only those 'who had suffered from a previous attack of the disease, either here or elsewhere' were truly safe.^{xlvi} Business kept twenty-five year-old merchant Berrien Burroughs in the city - he died on 25 August; fifty-eight year old Col. Joseph Jackson, a former Mayor and son of Revolutionary General James Jackson, also elected to stay and succumbed to the disease on 29 September.^{xlvi} Indeed one resident reported that among those who remained in the city during the epidemic 'nearly all ... were more or less seized with the prevailing disease' another strong indication that not many residents had immunity.¹ Even the Mayor, John Ward, was infected on 7 September, though ultimately he recovered. The

death of even a few eminent locally-born people from yellow fever evidently came as a shock to the community. One lowcountry observer noted that ‘The visitation has come upon it [Savannah] like a clap of thunder in a clear sky’ since, so far as local residents were concerned, yellow fever always selected its victims from the immigrant Northern and European population not from those who had lived a lifetime in southern climes.^{li} Yet the fact remains that among adult white males, statistically the most likely to die of yellow fever, only eighteen victims were born in Savannah compared to 267 born for example in Ireland. Since the high mortality of immigrants was not due to differential immunity there were evidently other, class-based, factors at work in Savannah in 1854.

The usual response of locals when yellow fever appeared in a community was to flee. Even though yellow fever was not a regular visitor to Savannah locals knew from reading newspaper accounts of epidemics elsewhere that it was a disease to be avoided if at all possible and thus it was ‘prudent for those to leave whose business will permit.’^{lii} During the devastating yellow fever epidemic in New Orleans in 1853, where more than ten thousand had died, up to half the population fled inland, in the process helping to spread the virus up the Mississippi River.^{liii} The Savannah press had published regular updates of the progress of the New Orleans epidemic as well as touching personal anecdotes like this: ‘a few days ago, and I was happy in the possession of a father, a mother, and three loved sisters; but I am alone now - I buried the last one yesterday.’^{liv} A register listing the names of 12,151 victims of the 1853 epidemic was advertised for sale in Savannah at 50¢ a copy.^{lv} Those who purchased Erasmus Fenner’s History of the Epidemic Yellow Fever, published early in 1854, read that the symptoms of the illness included ‘gastro-duodinitis – skin hot and dry, pulse 100, violent headache, pains in the

back and limbs, tongue coated, breath fetid, nausea and vomiting of bilious matters.’ And this particular patient survived.^{lvi} Internal bleeding could result in dark blotches under the skin, haemorrhaging from the nose and gums, as well as the classic ‘black vomit.’ Such descriptions only served to confirm that yellow fever was an illness to be avoided if it all possible – even those who survived endured up to two weeks of terrible symptoms. When daily burials from yellow fever began in Savannah on 11 August, it is hardly surprising that residents panicked.

The pandemonium took several forms including widespread use of preventatives and remedies, tincture of iron was particularly popular until the doctor promoting it himself succumbed to yellow fever, but perhaps the most common response was simple flight.^{lvii} Local resident Alexander Smets wrote to a friend in New York that once yellow fever appeared ‘the inhabitants were seized with a panic, which caused an immediate *saue qui peut* seldom witnessed before. I left, or rather fled, for the sake of my daughters, to Sparta, Hancock County. They were dreadfully frightened.’^{lviii} Young doctor Charles Hartridge was not the only resident to write to a loved one that ‘quite a panic exists here’, as people packed up their families and headed inland.^{lix} The *Daily National Intelligencer* reported that ‘Letters received here from Savannah state that the yellow fever is exceedingly violent and confined to no section of the city. The weather is exceedingly hot, and citizens are flying in all directions.’^{lx} Those who fled to nearby rural areas chose the best course of action because they were unlikely to be the source of a new outbreak due to the preference of the *aedes aegypti* mosquito for urban environments.^{lxi} Sick people could therefore visit friends and relations outside of the city with minimal risk to themselves or their hosts. The same could not be said for those who fled to

Augusta, readily accessible from Savannah via road or boat. As late as the end of August the Augusta press was reporting their city was ‘unusually healthy’ despite the ‘numbers coming up from Charleston and Savannah.’^{lxii} On 8 September the Savannah Morning News reported the death of Dr Freeman Schley who had retired to his mother’s house in Augusta after contracting yellow fever in Savannah.^{lxiii} He was probably one of several who brought the virus to the city and initiated a new epidemic that claimed more than hundred lives.

Back in Savannah, even before August was over it was estimated that ‘one half or more are gone’ and by early September when the epidemic was at its height newspapers reported ‘that the business of the city is almost suspended. . . . Half the boarding-houses have been deserted by their proprietors. West of Bull Street ninety-five business houses were shut up. ‘Closed on account of sickness’ meets the eye at every turn.’^{lxiv} At the onset of the epidemic Savannah’s white population perhaps totalled fifteen thousand.^{lxv} Northern newspapers estimated that the shrunken white population was ‘not over 3500 white people’, and one reported only ‘1600 inhabitants remain.’^{lxvi} The *Georgian* scoffed at such figures ‘That this is a most ridiculous under estimate of the number of white inhabitants now in Savannah, no one in our midst will, we presume, pretend to deny. . . . Had our inhabitants really been thinned out by absence from fifteen hundred or three thousand, the distress among them would have been far less that we have witnessed.’^{lxvii} The *Georgian* speculated ‘that a census taken to-day would show from six to seven thousand whites, whom neither death nor fear has removed from the city’ and when an official census of the city was published on 2 October it counted 6,288 whites and 5,491 blacks for a total population of 11,779.^{lxviii}

One resident was aware that ‘about ten thousand people have left the city since the fever has commenced’ but he also knew that émigrés were not drawn uniformly from all sections of society. As he put it: ‘nearly every who can, is leaving.’^{lxi} Those who fled the city were disproportionately wealthy, having not only the means to travel but also somewhere to go. The wealthy either had their own modes of transport or were able to pay someone to take them away from Savannah. Many owned plantations outside the city to which they could retire, or knew others who would shelter them. Dr Charles Hartridge reassured his mother that ‘Almost every one of your acquaintances has left town and many are still leaving’ while Liberty County resident Rev. Charles Colcock Jones observed that several ‘families originally from the country’ had left Savannah and taken refuge in his neighborhood.^{lxx} Dr Phineas Kollock was initially fairly phlegmatic about the appearance of yellow fever, commenting the ‘extremely hot weather ... has at length developed yellow fever among our Irish population. The disease is mostly confined to the Eastern part of the city. I do not feel apprehensive of its extending its ravages very much, although it is probable that we shall have cases occurring until frost.’ A week later his view had changed. The fever had become particularly ‘malignant’ and ‘I have determined therefore to send my family to Habersham [County] immediately.’^{lxxi}

Those left behind in the city consisted of those who could not leave and those who saw it as their moral duty to stay. James B. Foley, proprietor of the City Hotel, determined to stay earning the thanks of temporary residents who otherwise had nowhere else to go and the praise of both the Savannah Benevolent Association and the *Savannah Morning News*. The latter commented that his actions were particularly commendable ‘in the face of the fact that those who have prospered in our prosperity have in measure

deserted us in our adversity, we feel pleasurable emotion that one man and one establishment have waived personal interests for the public good.^{'lxxii} In response to understandably 'excited' letters from his daughter concerning his safety Dr Richard Arnold reminded her 'I have a duty to perform in staying here' and he was steadfast in his belief that 'yellow fever was not contagious.'^{lxxiii} Arnold was one of several doctors who remained in the city throughout the epidemic treating patients but unlike many he was evidently immune to the virus, most likely having caught it during the 1820 epidemic.^{lxxiv} Indeed the sacrifices made by physicians who went 'into the very dens of infection, ... inhal[ing] the reeking effluvia of filth & disease' Arnold thought required 'more true courage ... than to make a soldier.'^{lxxv} Dr Charlton Wells even returned to Savannah from Liberty County, despite the existence of the fever, because 'he was desirous to be doing something in his profession, and said in times of sickness the physician's post of duty claimed him.'^{lxxvi} Similarly Dr Freeman Schley 'determined to remain where he considered his post of duty, and give such aid as his talents and determination could afford to those who might be the victims of the disease.'^{lxxvii} Wells and Schley were two of the eight physicians to die during the epidemic. Religious leaders also refused to remove themselves from the risk of infection. William H. Crumley, pastor of Savannah's Methodist church wrote to a colleague at the height of the epidemic in early September: 'My only hope is in God, and if I fall, it will be at my post, doing all I can for the sick and the dying.'^{lxxviii} The Catholic Bishop of Savannah, Francis Xavier Gartland, laboured 'during night and day traversing the now desolate streets, passing from house to house, administering the sacraments, blessing the dying and consoling the living.'^{lxxix} After Gartland succumbed to the epidemic on 20 September only Father Edward Quigley was

left to minister to all the city's Catholics. Quigley later recalled 'visiting from eighty to one hundred sick persons a day, our deaths daily averaging from forty to forty-eight, this last being the maximum, and half of them generally Catholics. For two months at least I neither said Mass nor gave the Viaticum nor Extreme Unction to any one. I was able only to hear confessions, and was sometimes obliged to hear the confessions of husband and wife prostrated in the same bed at the same time, or rather I made their confessions for them in a general way and absolved them, hoping the mercy of God, and their own good dispositions.'^{lxxx}

Doctors and priests could have fled but chose to remain. Others did not have the luxury of choice. The poorest sections of white society lacked both the means to pay for transportation and a destination to fly to. These people relied on their jobs to provide a living wage and thus simply could not afford to give up work despite the danger. When employers fled, employees were left to fend for themselves. Most of the directors of the city's banks left the city, leaving their clerks to continue operations 'as usual.'^{lxxxi} One young man, Edmund, newly employed at a pharmacy in the heart of the central business district wrote to a friend that his 'boss being at the North' and all other employees either dead or gone, he had 'the pleasure of a strange store all to myself and a large business to attend to.' The nature of the business meant that Edmund was working seven days a week without respite since 'I am interrupted every minute to put up a yellow fever prescription' and he even had 'to eat my meals in the store.' He wrote to his employer telling him to return 'for if he did not he would find the store closed for I did not know how long I was to be spared.'^{lxxxiii} The widespread appearance of cholera in northern cities in the early summer of 1854 was also significant. The local press, which reported regularly on the

extent of the cholera epidemics in New York and Massachusetts, suspected that ‘hundreds who never, or seldom have ever spent a summer in Savannah, have stopped there this summer to avoid cholera at the North.’^{lxxxiii}

There are several pieces of evidence that suggest that the white population left behind in Savannah was disproportionately poor. The relatives of Dr Charlton Wells who succumbed to yellow fever himself on 12 September were told ‘Night and day he has been engaged, attending the sick, the most of whom were poor people. He said he knew he would never receive any compensation, but yet it was his duty and he would do it.’^{lxxxiv} Dr Richard Arnold similarly commented on physicians having to take ‘those very cases which will bring him neither money nor credit.’^{lxxxv} Even more telling is the absence of the vast majority of the dead from the city tax registers. Allowing that children and women were unlikely to appear on the tax registers, it is still noticeable that only fifty-one adult white men from a possible pool of four hundred who succumbed to yellow fever, paid tax in the city in 1854. This means that more than 85% of adult white men who died of yellow fever either were not resident in the city when the tax register was compiled and arrived afterwards, or they simply lacked any property that could be taxed. City taxes were levied on real estate, on merchants’ stock in trade, on carriages, horses and dogs, and on professionals such doctors and lawyers. Recently arrived immigrants, even if they had been in Savannah for more than a year, most often lived in rented accommodation and worked at an artisanal trade, and therefore did not possess the things that city taxes were levied on. All were supposed to pay an annual poll tax but officials do not seem to have been particularly zealous in collecting it.^{lxxxvi}

The poor, therefore, were disproportionately exposed to yellow fever in the sense that they remained behind when those who could fled. It is also clear that immigrants suffered from a geography of vulnerability as the over-crowded suburbs were more exposed to mosquitoes than other parts of the city. Savannah's main business district, bounded by East and West Broad Street, is elevated 50 feet above the river but the ground immediately east and west slopes down to close to river level where the ground becomes swampy and liable to flooding.

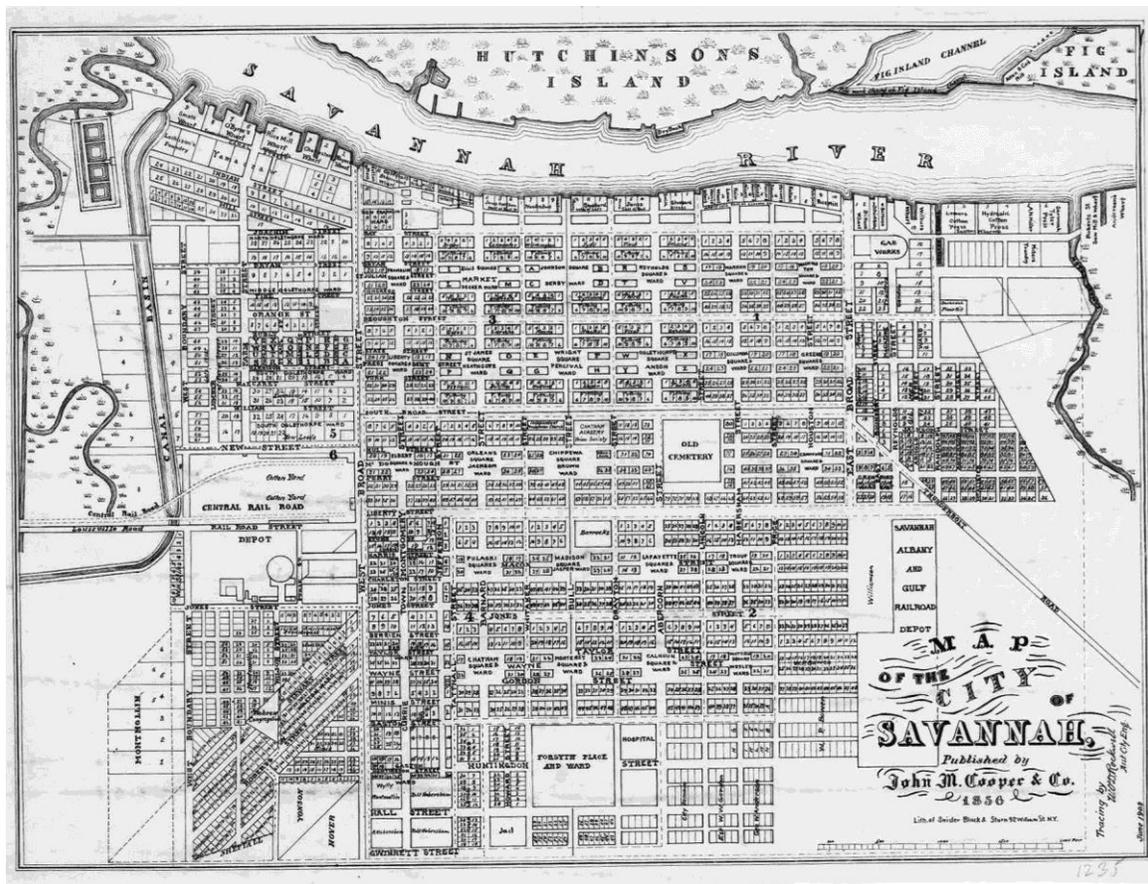


Fig 2. Map of Savannah in 1856.

Yamacraw, Robertsville, Currytown, Gilmerville and Trustee's Gardens, all popular with immigrants due to the large amount of cheap rented accommodation, were

built on those slopes, and the bodies of standing water often found nearby teemed with mosquitoes during the summer. The first reported cases clustered on the eastern edge of the city near the Gas Works in the neighbourhood known as Trustee's Gardens and many living in the eastern suburbs would have become infected before it was widely known that yellow fever was even in the city. The large number of both vectors and victims in this part of the city facilitated the rapid development of an epidemic. These people, whose circumstances did not permit them to live elsewhere, had no chance to flee even if they could have afforded to. The social geography of the city had placed them in harms way. It took more than two weeks for cases to appear in the heart of the city's central business district and another week before cases appeared south of Liberty Street where wealthy families tended to reside in newly laid-out neighbourhoods. Social geography thus gave the wealthy a short window of opportunity to leave without facing the full force of the epidemic. The preferred escape routes, either westwards on the Augusta Road or via boat, avoided the sickly eastern part of the city.

The manner in which news of the appearance of yellow fever was managed also favoured the white elite. At its meeting on 9 August the Board of Health heard confirmation of the presence of yellow fever in the city and immediately informed the Mayor. The members of city council and the Board of Health therefore had the opportunity to organise the departure of their families and friends well in advance of the general population.^{lxxxvii} In a deliberate attempt to limit the information available to the public two individuals known to have died of yellow fever had 'bilious fever' given as the cause of death in the press on 11 August. The Mayor had appeared personally before the Board of Health on 10 August to request that reports of the burial of these two victims

of the yellow fever be withheld from the newspapers, citing ‘the injury which he believed would result to the reputation and interest of the city.’ The Board ignored his objection and having post-mortem confirmation of the existence of ‘black vomit’ ordered the cemetery reports be published unaltered.^{lxxxviii} By the time the report reached the newspapers however it had been ‘altered without authority’ on the advice of ‘intelligent physicians’ who believed that these early cases were ‘sporadic’ and ‘that the disease did at that time did not appear likely to spread, nor to become episodic.’^{lxxxix} The first mention of yellow fever in the *Savannah Morning News* did not come until 17 August.

Indeed the *Savannah Morning News* was either remarkably ill-informed or complicit in the attempt to cover up the existence of yellow fever since on 10 August an editorial claimed ‘all the southern cities are at present in the enjoyment of unparalleled health. Even New Orleans, from which people formerly fled upon the approach of summer, as though they were fearful of being overtaken by some fiend incarnate, is free from all disease of an epidemic character. Sickness having apparently exhausted its resources at the south, has sought a new field for devastation in the North. While the alarmed inhabitants of the North are flying hither and thither, to avoid the clutches of the cholera and other fatal diseases, the denizens of New Orleans, Mobile, Savannah, and Charleston, are perfectly free from any epidemic disorder.’^{xc} By that date three victims of yellow fever had already been buried and ‘much sickness and distress’ prevailed in the eastern suburbs.^{xcii} Even when the epidemic became public knowledge the press continued to downplay the risk to residents. On 26 August the *Savannah Morning News* pointed out that not one of six hundred members of the volunteer corps had died and printed a letter from the manager of the Central Railroad Depot which stated that of 392

white employees only twelve were sick. Neighbourhoods adjacent to the depot were also reported to be ‘free from sickness.’ While the weather was accepted to be ‘very warm, and quite unfavourable for the health of the city’ the city authorities were ‘using every effort to relieve the sick and distressed.’ Rather optimistically the *Savannah Morning News* believed ‘The alarm which prevailed so generally for some days past, has in a great measure subsided, and our citizens look more calmly upon the existing disease which has visited our city.’^{xcii} In reality, those who could were leaving en masse.

By the second week in September the disease had reached the western neighbourhoods of Yamacraw, Currytown and Robertsville, and the number of victims increased dramatically. The weekly burial totals document the spread of the virus from one edge of the city to the other. As the virus became established in the eastern neighbourhoods in August weekly burial totals rose from 9 to 25 and then to 71. Then, rather oddly, burials plateaued at 71 for the week ending 3 September, leading some to hope that ‘the worst had occurred’ since ‘the disease has considerably abated, particularly as regards new cases.’^{xciii} In reality the lull was caused by the virus travelling westwards through the relatively depopulated central districts. The arrival of yellow fever in the heavily populated western neighbourhoods brought fresh victims for the virus and burial totals rose to 108 and then peaked at 129 in the week ending 17 September before falling back slightly to 118 by 24 September.

For those left behind in Savannah as the epidemic intensified during September life became miserable indeed. One resident lamented, ‘I feel alone in the midst of death. All my friends are gone, sick or dead – no one to even come and ask how we are.’^{xciv} No ships or trains ventured near the city and local slaves – key sources of fresh vegetables,

chickens, eggs and milk - shunned the weekly market. With the city effectively quarantined supplies of basic foodstuffs began to run short and fears grew that 'famine will be next. The country people are afraid to come. We cannot get a chicken in the place to make soup for the sick, and the groceries are nearly all shut up. I could find but one open this morning, and his stock was three or four spoiled hams... Many die of actual want of medicine, nursing and nourishment.'^{xcv} The *Savannah Republican* reported 'it is almost impossible to obtain a loaf just now, in consequence of the death and sickness of Bakers.'^{xcvi} The Young Men's Benevolent Association, in coordination with the Mayor, arranged for 500 loaves of bread to be shipped daily from Macon for distribution to the needy but it remains likely that the shortage of food was probably felt most acutely in poorer households that even in times of health lived hand-to-mouth existences.^{xcvii} Poor nutrition was possibly a contributory factor in higher mortality from yellow fever among the least well-off since the immune systems of the malnourished are less able to combat infection.^{xcviii}

Less clear is the significance of access to medical care on mortality rates. There is, even today, no effective treatment for those infected with yellow fever so there was no expensive miracle cure doled out to those who could afford it but denied to the poor. The remedies prescribed by physicians had no effect on the virus and might even have done more harm than good. Perhaps of more significance was palliative care provided by relatives and friends. Simply ensuring the sick had access to food and water might have been the difference between survival and death. While there were examples of people dying alone in miserable conditions nursing care was freely available at the Savannah Poor House and at the temporary hospitals established by visiting medical personnel from

Mobile and New Orleans.^{xcix} On 11 September the *Savannah Morning News* noted ‘our physicians who are still in health persevere without faltering in their efforts to relieve and restore their patients; that the Sisters of Charity are actively engaged in their mission of kindness and consolation; and that a cheerful and courageous devotion to the alleviation of distress, characterises our authorities, and all classes of our people.’^c Furthermore, the Young Men’s Benevolent Association was willing to pay for nursing care of the sick from the donated funds passed to them by the Mayor for distribution.^{ci} It does not seem likely that access to nursing care had a significant impact on mortality.

Just as the epidemic reached its peak, and as if the situation could not get any worse, a major Atlantic hurricane struck the city on 8 September. A storm surge of more than ten feet inundated Hutchinson’s Island opposite the city and outlying suburbs to the east and west. The city itself, perched on a fifty-foot bluff above the river, escaped flooding but the wind took a terrible toll: ‘the besom of destruction has swept over the city prostrating houses - uprooting trees - blocking up the streets.’ A resident described the city as ‘one vast, wide-spread desolation – churches and houses unroofed. Even the best on my lot is down.’^{cii} Those living in cheaper poorly-built houses in the eastern and western wards suffered particularly from the hurricane. Those already sick were now exposed to the elements. Moreover, the storm left large amounts of standing water that would have functioned as new breeding grounds for mosquitoes.

The fortnight following the hurricane marked the peak of the epidemic. On 12 September thirty-two people were buried and daily burials did not fall to single figures until 25 September. By the last week in September however it seemed that the worst was over, the vast majority of those who had remained in the city would have been infected

and had either died or recovered. The pool of victims able to maintain the cycle of human-mosquito-human transmission was greatly diminished and weekly burial totals fell sharply to just 20 in the week ending 1 October and never exceeded that number for the remainder of the epidemic. The *Savannah Republican* observed that ‘The absence of an increase in the number of internments is caused by the want of subjects for the pestilence.’^{ciii} By early October the intense heat of Savannah’s summer had begun to lessen, and combined with the reduction in deaths, some of those who had fled began to return. The *Savannah Morning News* counselled that only those ‘who have passed through the ordeal with restored health and strength can try the experiment with any degree of safety.’ The *Savannah Republican* was blunter: ‘We again caution our absentees to keep away, and not think of returning to their homes until a heavy frost will render their advent secure. As it is now, the want of subjects is all that keeps the pestilence from swelling our bills of mortality.’^{civ}

If the return of local residents would have been premature despite the abatement of the worst of the epidemic, then the arrival of ‘a yet larger number of persons .. brought here by vessel-loads from various cities of the North’ was sheer folly. The *Savannah Morning News* predicted that ‘They have come, a *majority* of them inevitably, to swell the long, black catalogue of death’ and gave a stark warning ‘Let it be shouted in the ears of those who are now here that, *to stay is death*: let it be proclaimed to all who intend to follow them, that, *to come is death*! DEATH!! nothing but DEATH!!’^{cv} New arrivals of northern and foreign-born non-immunes provided fuel for the continuation of the epidemic. Parts of the city which had had very few new cases on 5, 6 and 7 October suddenly reported 12 new cases on 10 October and a further twenty cases on 13

October.^{cvi} Yellow Fever claimed a further eighty victims in Savannah in October and November, all but three of whom were recent immigrants. Twenty-three year old Irishman Bartholomew Stephens had only been in the city for two weeks when he died of yellow fever on 17 October, his compatriot, twenty-five year old Michael Bennet lasted just ten days before he died on 23 October.^{cvii}

On 13 November the first frost appeared coating the city in a layer of ice 'as thick as window glass.'^{cviii} On 28 November the last victim of the epidemic, 28-year-old Chicago-born sailor John McKnight, was buried. This article has shown that yellow fever became a selective disease due to sociological rather than medical reasons. Yellow fever certainly was a 'strangers' disease' but not because strangers were unacclimated to living in Savannah. Rather it was a 'strangers' disease' because strangers were also disproportionately male, in their 20s, working outside, and resided in neighbourhoods close to low swampy ground where mosquitoes thrived. The exodus of wealthy citizens as soon as yellow fever appeared, combined with the slow penetration of the virus into the wealthier neighbourhoods meant that there were comparatively few locally-born people who faced the full force of the epidemic. The conclusions drawn from Savannah's data would probably apply equally to other cities where yellow fever was an occasional visitor such as Augusta, almost certainly infected by those fleeing Savannah in 1854, and Norfolk, which had gone thirty years without a case of yellow fever before a terrible epidemic in 1855 claimed more than two thousand lives.^{cix} Young male immigrants in Savannah in 1854 died in such large numbers because they were, by-and-large, the ones who were left behind to face the full fury of a yellow fever epidemic.

ⁱ Reprinted in the Savannah Morning News 6 September 1854.

ⁱⁱ Report in Fayetteville Observer 21 September 1854

ⁱⁱⁱ Raleigh Register 20 September 1854 and Daily National Intelligencer 23 September 1854. Large numbers of people died of yellow fever in Charleston (627) and New Orleans (2,425) in 1854 but both cities were substantially larger than Savannah with populations of c.50,000 and c.130,000 respectively compared to c. 25,000 in Savannah. M. Foster Farley, An Account of the History of Stranger's Fever in Charleston, 1699-1876 (Washington: University Press of America, 1978), 102. George Augustin History of Yellow Fever (New Orleans, 1909), extracted here:

<http://nutrias.org/facts/feverdeaths.htm>

^{iv} This terminology is most often applied to modern day disasters but it can be usefully adopted here. See for example, Juha I. Uitto, 'The Geography of Disaster Vulnerability in Megacities: A Theoretical Framework' Applied Geography 18.1 (1998) 7-16. Shiego Takahashi, 'Social Georgraphy and disaster Vulnerability in Tokyo' Applied Geography 18.1 (1998) 17-24. A. Curtis, J.W. Mills and M. Leitner, 'Katrina and Vulnerability: the Geography of Stress.' Journal of Health Care for the Poor and Underserved 18.2 (2007), 315-30. Susan L. Cutter. 'The Geography of Social Vulnerability: Race, Class and Catastrophe' (2006) <http://understandingkatrina.ssrc.org/Cutter/>

^v On Philadelphia see J.H.Powell, Bring out your dead: The Great Plague of Yellow fever in Philadelphia, in 1793 (Philadelphia: University of Pennsylvania Press, 1949) and Billy G. Smith and J. Worth Estes, "A Melancholy Scene of Devastation": The Public Response to the 1793 Philadelphia Yellow Fever Epidemic (Philadelphia: Science History Publications, 1997). On public health see Margaret Humphreys, Yellow Fever and the South (New Brunswick, N.J.: Rutgers University Press, 1992) and John H. Ellis, Yellow Fever & Public Health in the New South (Knoxville: University of Kentucky Press, 1992).

^{vi} John Duffy, Sword of Pestilence: The New Orleans Yellow Fever Epidemic of 1853 (Baton Rouge: Louisiana State University Press, 1966); Jo Ann Carrigan, The Saffron Scourge: A History of Yellow fever in Louisiana, 1796-1905 (Lafayette: University of Southwestern Louisiana, 1994).

^{vii} M. Foster Farley, An account of the History of the Stranger's Fever in Charleston, 1699-1876 (Washington: University Press of America, 1978); Peter McCandless, Slavery, Disease and Suffering in the Southern Lowcountry. (Cambridge and New York: Cambridge University Press, 2011).

^{viii} Among those to make this error are K. David Patterson, 'Yellow Fever Epidemics and Mortality in US, 1693-1905', Social Science & Medicine 24.8 (April 1992), 858; Walter J. Fraser Jr., Savannah in the Old South (Athens: University of Georgia Press, 2003), 299; and Jacqueline Jones, Saving Savannah: The City and the Civil War (New York: Knopf, 2008), 33.

^{ix} For the estimate of the number of sick see Savannah Morning News, 11 November 1854. Mortality rates for yellow fever range from 5-50%. Thomas P. Monath and Martin

S. Cetron 'Prevention of Yellow Fever in Persons Traveling to the Tropics' Clinical Infectious Diseases 34.10 (May 15, 2002), 1369-1378; Joy M. McFarland, Larry M. Baddour, Jeffery E. Nelson, Sandra K. Elkins, Robert B. Craven, Bruce C. Cropp, Gwong-Jen Chang, Alan D. Grindstaff, Allen S. Craig and Russell J. Smith, 'Imported Yellow Fever in a United States Citizen' Clinical Infectious Diseases Vol. 25, No. 5 (Nov., 1997), 1145.

^x The original sources of information for all victims' names were the cemetery sextons. The vast majority of names appear in several sources, but there was one occasion when the Catholic sexton failed to make a report to the Board of Health and thus some Catholic victims can only be found in the Catholic burial records. On another occasion the Savannah Morning News neglected to print the daily list of victims, but Board of Health records supplied the missing names. A few people had two different causes of death listed in two different sources (such as yellow fever and bilious fever), in each instance I recorded this as a yellow fever case. Savannah Board of Health Minute Books, Savannah Municipal Archives; Laurel Grove Cemetery, Savannah, Georgia, Volume 1: 12 Oct 1852 - 30 Nov 1861 (Savannah: Georgia Historical Society, 1996.); Sacramental Registers, Catholic Pastoral Center, Savannah.

^{xi} It is impossible to know how many people fell into this category. One resident who fled to Griffen, north of Macon reported 'many ... who have left have found a grave' suggesting that the overall mortality from yellow fever was somewhat higher than the burial statistics indicate. Additional victims included Capt Williams who ran a regular boat service between Sunbury and Savannah and was buried in Sunbury; James Newton Jones who had lingered in Savannah for just four hours collecting some family papers

before returning home to Liberty County; 6 year old Eliza Jane Harden, taken from the city and buried at her mother's family home in Bryan County; Joseph and the Rev. Benjamin Burroughs who had fled to Burke County; and Mrs Jannet Gallie who visited her sick mother in the city, contracted the disease and died at her home on the Isle of Hope. Diary of Mary E. Copp, 3 September 1854. Daniel Denison Copp Papers, Perkins Special Collections Library, Duke University. Rev C. C. Jones to C. C. Jones Jr., 6 September 1854 & idem to idem 9 October 1854 in Robert Manson Myers, The Children of Pride: A True Story of Georgia and Civil War (New Haven: Yale University Press, 1972), 83 & 99. William Harden, Recollections of a Long and Satisfactory Life (New York: Negro Universities Press, 1968), 52. Savannah Morning News 12 & 19 September 1854.

^{xii} The mosquito is able to pass on the virus after 14 days when the mean temperature is 25 degrees C but after just 10 days when the mean temperature is 30 degrees C. For the first six weeks of the epidemic Savannah's mean temperature was 27-28 degrees C.

Michael A. Johansson, Neysari Arana-Vizcarrondo, Brad J. Biggerstaff, and J. Erin Staples 'Incubation periods of Yellow Fever virus' American Journal of Tropical Medicine 83.1 (2010), 183-88. Savannah Morning News, 11 November 1854.

^{xiii} For example of 73 patients treated at one infirmary, only 14 (19%) died, while of the 137 cases treated by Dr Stotesbury, only 8 died (6%). Savannah Morning News, 14 & 18 October 1854.

^{xiv} Savannah Morning News, 13 October 1854. As Savannah's black population had their own section of Laurel Grove Cemetery (Laurel Grove South) white and black burials

were itemised separately in the Board of Health Minutes and by the Savannah Morning News.

^{xv} Richard Arnold to Sol Cohen 29 September 1854. Richard H Shryock, [ed], Letters of Richard D. Arnold M.D. (Durham, North Carolina, Seeman Press, 1929), 71. The Savannah Republican concurred: ‘Contrary, perhaps to the general impression, there has been a most extraordinary amount of sickness among the blacks as well as whites – though the mortality among the former has been far less than among the latter.’ Savannah Republican cited in the Charleston Daily Courier, 29 September 1854.

^{xvi} Kenneth F. Kiple and Virginia H. Kiple ‘Black Yellow Fever Immunities, Innate and Acquired, as Revealed in the American South’ Social Science History 1.4 (Summer, 1977), 419-436.

^{xvii} Kiple states this in several articles, but most clearly in Kenneth F. Kiple, ‘Response to Sheldon Watts’ Journal of Social History, 34.4 (2001), 969-974.

^{xviii} Richard Arnold to Sol Cohen 29 September 1854 in Shryock, [ed], Letters of Richard D. Arnold, 71. On black survivability during yellow fever epidemics see also Humphreys, Yellow Fever and the South , 6-7 and Carrigan, Saffron Scourge, 253-4.

^{xix} cited in the Charleston Daily Courier, 29 September 1854. City census figures from Savannah Morning News, 2 October 1854. In 1850 the federal census had counted 6,231 slaves and 686 free blacks in the city.

^{xx} New York Times 26 December 1854.

^{xxi} Patterson, ‘Yellow Fever Epidemics’, 855.

^{xxii} Only 24% of victims were female. Carrigan suggests that a gendered immunity might exist, but I think a sociological reason is more likely. Carrigan, Saffron Scourge, 256-7

^{xxiii} Daily South Carolinian 24 August 1854

^{xxiv} On diurnal activity see

http://entomology.ifas.ufl.edu/creatures/aquatic/aedes_aegypti.htm and

http://www.wrbu.org/SpeciesPages_non-ANO/Non-ANO_A-hab/AEaeg_hab.html

^{xxv} Richard D. Arnold, An essay upon the relation of bilious and yellow fever prepared at the request of, and read before the medical society of the state of Georgia, at its session held at Macon on the 9th April 1856. (Augusta, McCafferty's Office J. Morris Printer, 1856), 9.

^{xxvi} Jones to Jones Jr. 5 October 1854 in Myers, The Children of Pride, 88-89 and 97 (quote).

^{xxvii} See Jo Ann Carrigan, 'Privilege, Prejudice and the Stranger's Disease in Nineteenth Century New Orleans' Journal of Southern History, 36, (1970), 568-78; Patterson, 'Yellow Fever Epidemics,' 861; Caroline Banks Black 'Aspects of the History of Yellow Fever Epidemics in Charleston, South Carolina' MA Thesis, Duke University, 1943, 10-17.

^{xxviii} John W. Monette, Observations on the Epidemic Yellow Fever of Natchez and of the South-West (Louisville: Prentice & Weissinger, 1842), 9

^{xxix} Immigrants constituted 51% of adult white males in 1860. Dennis C. Rousey, "From whence they came to Savannah: The Origins of an Urban Population in the Old South" Georgia Historical Quarterly, 79 (1995), 312.

^{xxx} William R Waring, Report to the city council of Savannah on the epidemic disease of 1820 (Savannah: Henry P Russell, 1821), 27.

^{xxx} Elisha Bartlett The History, diagnosis, and treatment of the fevers of the United States (Philadelphia: Blanchard and Lea, 1852), 506.

^{xxxii} Carrigan, 'Privilege, Prejudice and the Stranger's Disease', 570-2. Between 1817 and 1905 there were seventeen years in New Orleans where deaths from yellow fever exceeded a hundred, and a further seven years where deaths exceeded a thousand.

<http://nutrias.org/facts/feverdeaths.htm>

^{xxxiii} McCandless, Slavery, Disease and Suffering, 61-83; 106-124.

^{xxxiv} Savannah Morning News 30 August 1854

^{xxxv} See for example Carrigan, 'Privilege, Prejudice and the Strangers,' 571.

^{xxxvi} cited in the Charleston Daily Courier, 28 September 1854

^{xxxvii} *ibid.*

^{xxxviii} Pritchett and Tunali go to great lengths to filter out the role of differential immunity in New Orleans, but this is not necessary in Savannah. Jonathan B. Pritchett and Insan Tunali, 'Strangers' Disease: Determinants of Yellow Fever Mortality during the New Orleans Epidemic of 1853' Explorations in Economic History, 32 (1995), 517-539.

^{xxxix} Arnold, An essay upon the relation, 3.

^{xl} Sheldon Watts, 'Yellow Fever Immunities in West Africa and the Americas in the Age of Slavery and Beyond: A Reappraisal' Journal of Social History, 34.1 (2001), 955-967.

Mosquitoes are also able to keep the virus alive by transmitting it to their young without the need for human involvement. Thomas H. G. Aitken, Robert B. Tesh, Barry J. Beaty and Leon Rosen 'Transovarial transmission of Yellow Fever Virus' American Journal of Tropical Medicine and Hygiene 28.1 (1979), 119-21.

^{xli} One doctor's bill showed that he visited a single large lowcountry plantation 86 times

between January and June 1853. J. H. Easterby, The South Carolina Rice Plantation as Revealed in the Papers of Robert F. W. Allston, 2nd ed. (Columbia: University of South Carolina Press, 2004), 342-4.

^{xlii} J.J.Chisholm, ‘A brief sketch of the Epidemic Yellow Fever of 1854 in Charleston’ Charleston Medical Journal and Review 10.4 (July 1855), 435.

^{xliii} Some argued the Danish brig *Charlotte Hague* was to blame. The vessel docked at Tybee Island, en route from Havana to Copenhagen, on June 30th and requested medical assistance for three crew members suffering from fever. By 3 July these crew were in a Savannah hospital, but all were discharged on 7 July. If one or all of these men had a mild case of yellow fever it is possible they might have been the source of the epidemic. However, there was a considerable gap between the departure of the *Charlotte Hague* and the first case of yellow fever – about eighteen days – making it more likely that the *Charlotte Hague* was not the source and that yellow fever was introduced by an as yet unidentified means. William Hume, ‘On the Introduction, propagation and decline of the Yellow Fever in Savannah during the summer of 1854’ Charleston Medical Journal and Review 10.1 (Jan 1855), 9, 31. Letter of Dr Charters to the Mayor, 16 December 1854 in Savannah Board of Health Minutes, 1 January 1855.

^{xliv} Savannah Morning News 11 November 1854.

^{xliv} Arnold, An essay upon the relation, 4-5.

^{xlvi} *ibid* 6-7.

^{xlvi} While nearly everyone resident in 1820 would have been infected with yellow fever, Savannah’s white population according to several estimates shrank from 2,436 counted by the census to roughly 1,000. More than 600 perished leaving perhaps only 400 or 500

who gained immunity. Many of those would have died or moved away in the intervening thirty four years. For population data in 1820 see New York Commercial Advertiser 29 September & 9 October, 1820.

^{xlviii} H. L. Byrd, ‘Observations on Yellow Fever’ Charleston Medical Journal and Review, May 1855 reprinted in the Oglethorpe Medical and Surgical Journal, 1.5 (December 1858), 297.

^{xlix} See obituaries in the Savannah Morning News 28 August and 30 September, 1854.

^l New York Times 26 December 1854. Other notables fell sick but recovered including three members of the Habersham family, R. R. Cuyler, president of the Central Railroad, and Mrs Elizabeth Hunter, wife of the president of the Marine Bank. All were Savannah natives. E. F. Campbell in Augusta to George J. Kollock in Clarkesville Georgia. 1 October 1854. Kollock Family Papers, Georgia Historical Society, Savannah.

^{li} Jones to Jones Jr., 11 September 1854, Myers, Children of Pride, 87

^{lii} Letter of R. R. Cuyler, Savannah Morning News, 26 August 1854.

^{liii} Jo Ann Carrigan ‘Yellow Fever in New Orleans, 1853: Abstractions and Realities’ The Journal of Southern History Vol. 25, No. 3 (Aug., 1959), 349. Duffy, Sword of Pestilence, 62.

^{liv} Savannah Morning News 26 August 1853.

^{lv} Savannah Morning News 26 December 1853.

^{lvi} E.D. Fenner, History of the Epidemic Yellow Fever at New Orleans La. in 1853. (New York: Hall, Clayton, 1854), 17.

^{lvii} Dr Philo Wildman was buried on 10 September.

^{lviii} ‘Sauve qui peut’ translates roughly as ‘every man for himself’. Alexander Smets to Robert Balmanno, New York Times, December 26, 1854.

^{lix} Charles John Hartridge to Mary Hartridge Savannah 25 August 1854. Walter C Hartridge Collection, # 1349 Box 44, Folder 631 Documents, Hartridge, 1853-9. Georgia Historical Society, Savannah

^{lx} Daily National Intelligencer, (Washington DC) 28 August 1854

^{lxi} Savannah Morning News, 19 September 1854.

^{lxii} Augusta Constitutionalist cited in Savannah Morning News, 31 August 1854.

^{lxiii} Savannah Morning News, 8 September 1854.

^{lxiv} Letter of Edmund ? to Francis B Hacker dated Savannah 29 August 1854

Savannah Yellow Fever 1854, Georgia Historical Society, Savannah. Fayetteville Observer, 11 September 1854.

^{lxv} *The Georgian* cited in the Charleston Daily Courier, 29 September 1854.

^{lxvi} Fayetteville Observer 21 September 1854; Ripley Bee (OH) 7 October 1854.

^{lxvii} cited in the Charleston Daily Courier, 29 September 1854.

^{lxviii} *ibid* and Savannah Morning News, 2 October 1854. The census was simply a count of the number of people left in the city, and was not broken down by age, gender, or birthplace.

^{lxix} George Kollock to George Jones, 9 September 1854 Jones Family Papers, Georgia Historical Society, Savannah. Another resident concurred: ‘everybody that can is leaving.’ George A. Gordon to William W. Gordon 22 August 1854. Gordon Papers, Southern Historical Collection, University of North Carolina at Chapel Hill.

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- ^{lxx} Charles John Hartridge to Mary Hartridge 25 August 1854. Jones to Jones Jr. 6 September 1854, Myers, The Children of Pride, 83.
- ^{lxxi} Dr Phineas M. Kollock to George J. Kollock, 14 August 1854. Kollock Family Papers, Georgia Historical Society. E F Campbell in Augusta to George J Kollock in Clarkesville Georgia, 22 August 1854. Susie M Kollock, ‘ Letters of the Kollock and Allied Families, 1826-1884’ Georgia Historical Quarterly 34, (1950), 138-9.
- ^{lxxii} Savannah Morning News, 12 September & 18 October 1854; Savannah Benevolent Association Minutes, 3 November 1854. Georgia Historical Society, Savannah.
- ^{lxxiii} Richard Arnold to Miss Ellen Arnold 2 September 1854. Shryock ed., Letters of Richard D. Arnold, 68-9. Harden, Recollections, 52.
- ^{lxxiv} Arnold would have been twelve years old in 1820.
- ^{lxxv} Richard Arnold to Octavus Cohen 5 October 1854. Shryock ed., Letters of Richard D. Arnold, 71.
- ^{lxxvi} Mrs Mary Jones to C.C. Jones 14 September 1854. Myers, The Children of Pride, 88-9.
- ^{lxxvii} Savannah Morning News, 12 September 1854.
- ^{lxxviii} Savannah Morning News, 20 September 1854. Crumley’s nine year old son was buried on 15 September, but Crumley himself recovered from his own infection with yellow fever.
- ^{lxxix} Rev Dr J. J. O’Connell, Catholicity in the Carolinas and Georgia (New York, D & J Sadler & Co, 1879), 521.
- ^{lxxx} *Ibid*, 527-8. In addition to Gartland, a fellow Catholic Bishop succumbed, as did two Sisters of Mercy, and a Methodist clergyman. Only the pastor of the Independent

Presbyterian church, Willard Preston, the rector of Christchurch Episcopal W.T.

Dickinson Dalzell and the Episcopalian Bishop, Steven Elliott remained healthy. E F Campbell to George J Kollock, 1 October, 1854.

^{lxxx}ⁱ New York Times 26 December 1854

^{lxxx}ⁱⁱ Letter of Edmund ? to Francis B Hacker Savannah 29 August 1854. No 'Edmund' was listed among the victims of the disease.

^{lxxx}ⁱⁱⁱ On reports of cholera see Savannah Morning News 1, 3 & 7 August 1854; quote Charleston Daily Courier, 29 September 1854

^{lxxx}^{iv} Mrs Mary Jones to C.C. Jones 14 September 1854 Myers, The Children of Pride, 88-9

^{lxxx}^v Richard Arnold to Octavus Cohen 5 October 1854. Shryock ed., Letters of Richard D. Arnold, 71.

^{lxxx}^{vi} By contrast in 1848 1,949 white men paid city taxes, equivalent to 89.5% of the white male population aged over 21. The white population of Savannah was enumerated in Joseph Bancroft, Census of the City of Savannah (Savannah: Edward C. Councill, 1848), 1st ed., 4-12. Savannah Tax Digests, 1848 & 1854, Georgia Historical Society, Savannah.

^{lxxx}^{vii} At one meeting of the city council only two councillors were present. City Council Minutes, 21 September 1854, Georgia Historical Society, Savannah.

^{lxxx}^{viii} Board of Health Minutes, 9 & 10 August 1854.

^{lxxx}^{ix} Savannah Morning News 25 August 1854

^{xc} Savannah Morning News 10 August 1854

^{xci} Board of Health Minutes 9 August 1854

^{xcii} Savannah Morning News 26 August 1854

^{xciii} R. D. Arnold, 'The indentity of dengue or break-bone fever, and of yellow fever' The Savannah Journal of Medicine I (1859), 308. Savannah Morning News, 28 August 1854

^{xciv} Savannah Morning News 20 September 1854.

^{xcv} *ibid.*

^{xcvi} cited in the Charleston Daily Courier, 16 September 1854.

^{xcvii} Young Men's Benevolent Association Minutes, 12 & 13 September 1854. Georgia Historical Society, Savannah.

^{xcviii} See for example, F. Gomez, 'Mortality in second and third degree malnutrition' Bulletin of the World Health Organisation 78.10 (2000), 1275-1280.

^{xcix} The arrival of 2 doctors, 3 assistants and 2 nurses from Mobile was noted in the Savannah Morning News 25 September 1854. By the time they left 3 weeks later they had treated 73 patients, just 14 of whom had died. Savannah Morning News 14 October 1854.

^c Savannah Morning News 11 September 1854.

^{ci} For example, Ward Committee No. 2, reported on 18 September than it had paid for twelve nurses to attend the sick under its jurisdiction. Young Men's Benevolent Association Minutes 18 September 1854. \$24,134.48 was donated to the YMBA for the relief of the citizens of Savannah according to the totals published in the Savannah Morning News. Additional money was donated to the Mayor and several clergymen.

^{cii} Mrs Mary Jones to C.C. Jones 14 September 1854. Myers, The Children of Pride, 88-9; Savannah Morning News 20 September 1854

^{ciii} cited in Charleston Daily Courier, 29 September 1854

^{civ} Savannah Morning News 5 October 1854, Savannah Republican as cited in the Charleston Daily Courier, 2 October 1954

^{cv} Savannah Morning News 11 October 1854

^{cvi} The minutes of the Savannah Benevolent Association recorded new cases and deaths for 10 ‘wards’ of the city but did not specify in the minutes which ward was which.

^{cvii} The Catholic burial register recorded how long these individuals had been in the city.

^{cviii} Savannah Morning News 15 November 1854

^{cix} George D. Armstrong, The Summer Of The Pestilence: A History of the Ravages of the Yellow Fever in Norfolk, Virginia, A. D. 1855. (Philadelphia: J. B. Lippincott & Co., 1856), 21.