

The Virginia Height Increase: The Effects of Climate, Diet, and Labour on the Health of  
Enslaved Men in the Cold South, 1815-1835

by

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## DEDICATION

*To Mom for her walks  
And to Dad for ne quid nimis.*

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## **ABSTRACT**

From 1815 to 1835, the height average of enslaved Virginian men increased while the average of European and North American men decreased. This thesis argues that climate should be considered a major influence on the skeletal height of the enslaved. Climate change in the 1810s shortened the crop growing season in Virginia, Maryland, and North Carolina—a region that this thesis calls the cold south. Foods specific to this region, such as milk and oily fish, provided additional calories and dietary vitamin D, supporting the health of Virginian slaves. The shorter growing season lessened labour demands, allowing cold-south slaves to rest longer. This period of rest maximized the nutritional advantage held by children enslaved in the cold south compared to other regions, initiating the temporary increase in adult skeletal height. Achieving this marker of good health reflects more the environment in which a person is enslaved rather than one's status.

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## CHAPTER 1 INTRODUCTION: THE VIRGINIA INCREASE

In January 1814, Thomas H. Jones, a Black reverend who published his account of enslavement in North Carolina, was sold away from the plantation on which he and his family had been born.<sup>1</sup> The day of his sale, Jones' former slaveholder forced him to walk, with the resident slave driver, Abraham, to his new slaveholding. The journey was "bitterly cold" and Jones had been "poorly clad to bear the keen air of a January day."<sup>2</sup> Jones' contemporaries, who were proponents of differing theories of race, would argue that, as someone with dark skin, Jones suffered because he was predisposed to warmer climates.<sup>3</sup> For those living in the nineteenth century, the climate, as well as the environment, was significant in how they interpreted, reacted to, and acted on the world around them. Yet, as historian Tony C. Perry has noted, much of the historiography of American slavery has avoided discussing the impact of cold weather on the enslaved population.<sup>4</sup> But the colder climate of the more northern U.S. South was unique among the other slaveholding regions in the Americas in its influence on the health of those with darker skin. In areas with differing seasons, the cold can be tolerated and warded off with layers of clothing. Coming to terms with an absent sun, however, was more challenging for people living in the early modern era.

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<sup>1</sup> Thomas H. Jones, "The Experience of Rev. Thomas H. Jones" in *From Bondage to Belonging: The Worcester Slave Narratives*, eds. B. Eugene McCarthy and Thomas L. Doughton (Amherst, MA.: University of Massachusetts Press, 2007), 129.

<sup>2</sup> Jones, "The Experience of Rev. Thomas H. Jones," 130.

<sup>3</sup> For more on the climate theory of race, see Ibram X. Kendi, *Stamped From the Beginning: The Definitive History of Racist Ideas in America* (New York: Nation Books, 2017), 84-85, 94-95. For contemporary examples see, James Breeden, ed., *Advice Among Masters: The Ideal in Slave Management in the Old South* (Westport, Conn.: Greenwood Press, 1980), 183-184; James Bowdoin in Kendi, *Stamped From the Beginning*, 113; James McCune Smith in Antebellum Black Climate Science: The Medical Geography and Emancipatory Politics of James McCune Smith and Martin Delany," *Environmental History* 26, no. 3 (2021): 470.

<sup>4</sup> Tony C. Perry, "In Bondage when Cold was King: the Frigid Terrain of Slavery in antebellum Maryland," *Slavery & Abolition* 38, no.1 (2017): 24.



We now understand that sunlight can exert a degree of influence on human health. The mechanism through which vitamin D effects our health can regulate certain measures to judge the health of a population—such as height. Slavery scholars have used height to judge the health of enslaved populations in the Americas. A few studies have emerged that consider the role of vitamin D in slave health, but they have focused on the general slave population in the U.S.<sup>5</sup> Calculating the levels of vitamin D in humans today requires one to take a blood test, which is out of the question for historians. Bio-archaeologists, who determine the relative health of a historical population by examining the bone chemical makeup, are also not able to measure vitamin D levels through bone assessments. But the historical record can help provide a picture. We can speculate on the impact of vitamin D on slave health by investigating the slave diet.

In the eighteenth-century slaveholding south, the slave diet was largely made up of pork and corn.<sup>6</sup> Historians of African-American cuisine have attempted to expand past these two foods by highlighting the contributions of foods, such as chitlins, black-eyed peas, and even Kool-Aid, to the cuisine canon.<sup>7</sup> The historical record still appears to be mired in the same collection of foods. Two nutritionally significant foods remain outside of this growing canon: milk and oily fish. These two items made up crucial aspects of slave provisions in the colder slaveholding south, contributing, as fatty foods, both calories and the dietary form of vitamin D.

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<sup>5</sup> Kenneth F. Kiple and Virginia Himmelsteib King, *Another Dimension to the Black Diaspora: Diet, Disease and Racism* (Cambridge: Cambridge University Press, 1981), 102-106; Scott Alan Carson, “Institutional Change, Geography, and Insolation in Nineteenth Century African- American and White Statures in Southern States,” *Journal of Economic Issues* 44, no. 3 (2010): 737-755.

<sup>6</sup> Philip D. Morgan, *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake and Lowcountry* (Chapel Hill, NC.: University of North Carolina Press, 1998), 134-138; Robert William Fogel and Stanley L. Engerman, *Time on the Cross: the Economics of American Negro Slavery*, new ed. (New York: Norton, 1989), 109-115.

<sup>7</sup> For the treatment of chitlins and Kool-Aid, see Adrian Miller, *Soul Food: The Surprising Story of an American Cuisine One Plate at a Time* (Chapel Hill: University of North Carolina Press, 2017), 110-129, 241-258. See also for a general investigation into the African-American cuisine canon, Jessica B. Harris, *High on the Hog: A Culinary Journey from Africa to America* (New York: Bloomsbury, 2012); Frederick Douglass Opie, *Hog and Hominy: Soul Food from Africa to America*. (New York: Columbia University Press, 2008).

Understanding the nutritional significance of these foods to the African-American canon illuminates the ways in which enslaved Africans and their descendants adapted to the cooler climates of Virginia, Maryland, and North Carolina—what I call the cold south. These cold-south slaves lived above the thirty-ninth parallel. This latitudinal position left them with four to five months of no useable UV radiation, rendering them at risk of vitamin D deficiency. Vitamin D is associated to a significant degree with tall height in enslaved men, even those from cold-south states further from the equator.<sup>8</sup> In population studies, adult terminal height, or stature, is often used to indicate the general health of a sample group. Stunted height can indicate prolonged periods of physical and nutritional deprivation and environmental stress as children.<sup>9</sup> But if these periods of stress are short enough, adolescents, and even young adults, can make up for lost time and meet their genetic parameters.<sup>10</sup>

This thesis suggests that while it is first necessary to obtain adequate nutrition to reach a height standard across populations, for enslaved men in the cold south, food alone was not enough to encourage changes across the population. Historian Richard Steckel and Robert Fogel have been prolific in their discussions on slave health, incorporating factors such as material conditions and disease to the issue of delayed growth among slave populations.<sup>11</sup> Historians Kenneth Kiple and Virginia Himmelsteib King have left a thorough work for those interested in U.S. slave health to explore, tackling each micronutrient and their contributions to slave health

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<sup>8</sup> Carson, “Insolation in Nineteenth Century African-American Statures,” 740. Another suggestion is that increased labour after the age of 10 may have increased exposure to sunlight. However, this seems more the case in a consistently open and flat landscape such as South Carolina. Virginia had much more and much taller vegetation cover. Slaves on tobacco plantations often traveled between one clearing of tobacco to another, which were separated by stretches of woodland.

<sup>9</sup> Richard H. Steckel, “A peculiar population: The nutrition, health, and mortality of American slaves from childhood to maturity,” *Journal of Economic History* 46, no. 3 (1986): 738-739.

<sup>10</sup> Robert William Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: W. W. Norton & Company, 1989), 139.

<sup>11</sup> Fogel, *Without Consent or Contract*, 130-145; Steckel, “A peculiar population,” 721-741.

and absence from slave diet.<sup>12</sup> However, these works have not explored the greater environmental context in which slaves lived. Neglecting this context implies that material conditions set the terms of enslavement and that we can judge slave health according to whether they had enough to eat and whether their working conditions were safe. Just as Fogel and Steckel implicated disease environments in the health of enslaved children, this thesis proposes that we also incorporate investigations of climate into our studies of slave health.

Climate events exerted influence on the amounts and kinds of crops farmers and slaves grew: when these events annihilated crops in Europe, they drove up prices and slaveholders reacted to the market by growing more of those crops. Because the type of crop grown on a slaveholding or plantation dictated the labour schedule, certain crops, such as tobacco, demanded more work, while others, such as wheat, did not. This additional rest was just as important as food for the health of slaves. Slavery scholars should consider the minute and larger patterns of climate events as part of the context of slave health. Ultimately, a confluence of factors—social, economic, and environmental—effectuated changes in the height of enslaved men in early nineteenth-century Virginia.

A striking paradox exists in the study of height averages across the early modern era. In modern-day studies, a population's height average increases alongside their income or wages. The "antebellum paradox" describes how European and North American men in the 1820s and 1830s declined in height despite a concurrent rise in wages.<sup>13</sup> Even more striking, enslaved men in the U.S. South did not see this decline in height until the late 1830s. Instead, from 1815 to

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<sup>12</sup> Kiple and King, *Another Dimension to the Black Diaspora*.

<sup>13</sup> Michael R. Haines, Lee A. Craig, and Thomas Weiss, "Did African Americans experience the 'Antebellum Puzzle'? Evidence from the United States Colored Troops during the Civil War," *Economics and Human Biology* 9 (2011) 45-55; John Komlos, "A Three-Decade History of the Antebellum Puzzle: Explaining the Shrinking of the U.S. Population at the Onset of Modern Economic Growth," *The Journal of the Historical Society* 13, no. 4 (2012): 395-396.

1835, the enslaved adult male population in Virginia saw an increase in stature year upon year (see table 1).<sup>14</sup> Beginning in 1805, the height of freeborn Black Virginians decreased, roughly, by 0.2 inches every ten years until 1835. In contrast, enslaved Virginian men saw their height jump by a full inch from 1815 to 1825 and then once more by 0.6 inches from 1825 to 1835.

Table 1      The Virginia increase: The height averages of enslaved and freeborn men in Virginia from 1765 to 1835.

<b>Birth Cohort Centered on Year</b>	<b>Stature of free-born in inches</b>	<b>Stature of slave-born in inches</b>
1765	67.8	67.2
1785	68.0	66.6
1795	67.7	67.6
1805	67.7	67.3
1815	67.6	67.2
1825	67.7	68.2
1835	67.2	68.8

Sources: Data taken from Howard Bodenhorn, “A Troublesome Caste: Height and nutrition of Antebellum Virginia’s Rural Free Blacks,” *Journal of Economic History* 59, no. 4 (1999): 983.

Why were enslaved men in Virginia isolated from the antebellum paradox through the 1820s and most of the 1830s? From 1800 to 1815, their average height did not progress linearly. A shift occurred within the 1810s that encouraged good physical health. One explanation may be the end of the War of 1812 in 1814-15. This war, as well as the preceding political tensions, between the U.S. and Britain gave economic sanctions that depreciated trade prospects, policies that hit agricultural regions hard.<sup>15</sup> Such political tensions occurred on the backdrop of a

<sup>14</sup> Howard Bodenhorn, “A Troublesome Caste: Height and Nutrition of Antebellum Virginia's Rural Free Blacks,” *Journal of Economic History* 59, no. 4 (1999): 983, table 2.

<sup>15</sup> Donald Hickey, *The War of 1812: A Forgotten Conflict* (Urbana, IL.: University of Illinois Press, 1989), 20-21.

dramatic climatic cooling period beginning in 1810 that had disastrous consequences in the European and North American agrarian sectors.<sup>16</sup>

Farmers, accustomed to a relatively moderate climate, with mild winters and summers in the century previous, dismissed the first long winter in 1809 as a bad year. But as the cold, and simultaneously dry and wet, weather continued through the 1810s, these farmers, and most importantly here, slaveholders, likely changed their agricultural strategies. This change decreased the time enslaved people spent at work during the winter and spring. It also translated into real-world changes in the demand of products like wheat and other grains. As grain prices rose through 1809 and 1810, the potential wealth at hand encouraged slaveholders turn back to wheat as a cash crop. But the 1810s was not the first boom in the overseas grain trade in the U.S. A similar rise in price in the mid-eighteenth century motivated those looking for better soils than the depleted fields in the tidewater to head further west in Virginia toward the piedmont.<sup>17</sup> Additionally contributing to western settlement, as settlers and indigenous Americans clashed over the encroachment, was an increasingly warming climate across the second half of the eighteenth century.

The eighteenth century was warmer than the preceding hundred years, which had seen brutally cold and snowy winters. Climate scientists and historians have called this period of cool temperatures the little ice age.<sup>18</sup> Beginning between 1250 and 1300, the little ice age extended

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<sup>16</sup> Gillen D'Arcy Wood, *Tambora: The Eruption that Changed the World* (Princeton, NJ.: Princeton University Press, 2014), 199-228.

<sup>17</sup> Allan Kulikoff, *Tobacco and Slaves: The Development of Southern Cultures in the Chesapeake, 1680-1800* (Chapel Hill: University of North Carolina Press, 1986), 46-47.

<sup>18</sup> Brian Fagan, *The Little Ice Age: How Climate made History, 1300-1850* (New York: Basic Books, 2000). Historiographical references to the little ice age capitalize the term to emphasize its historical significance during the early modern period. I would like to keep this term in lowercase letters to emphasize the ways in which this period, and the smaller climatic events within it, was not a climatic anomaly. For a historiographical discussion on the emergence on the term, see A. E. J. Oglivie and T. Jonsson, "'Little ice age' research: A perspective from Iceland," *Climatic Change* 48, no. 1 (2001a): 10-12.

through four centuries and ended around roughly 1850, when the heating effect from widespread industrialization began to drastically warm the globe.<sup>19</sup> This chapter is not concerned with larger pattern of climatic events that make up the little ice age. Instead, this chapter will delve into a singular climatic event in the nineteenth century, the cold decade. This period stands out amongst others in the little ice age because climate scientists have pinpointed real-world catalysts for it—two major volcanic eruptions, alongside multiple smaller eruptions, that began in 1809.

The effect of the decade of global cooling on agriculture was so extreme that 1817 has been called the “year of famine,” heralding what John Post declared as Europe’s last subsistence crisis.<sup>20</sup> This crisis may have been responsible for the decline in European and American male height in the first half of the nineteenth century. In the U.S., bitterly cold but dry winters and freak weather events caused farmers to lose crops from spring to autumn. In 1816 in Virginia, Thomas Jefferson applied for a loan on the basis of the “disastrous corn-crop of the last year” during a parade of terrible growing seasons in the northern hemisphere.<sup>21</sup> Elias Fordham, an English traveller, visited Virginia in 1817 and found the climate “from the Latitude of 39°North...very severe. Sleighs are seen at every house. The Monogahela [River]...is frozen across every winter, and loaded waggons pass to the opposite banks.”<sup>22</sup> In the midst of this environmental crisis, enslaved Virginian men kept a measure of good health and they continued

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<sup>19</sup> Fagan, *The Little Ice Age*, 202-204.

<sup>20</sup> John Post, *The Last Great Subsistence Crisis in the Western World* (Baltimore, MD.: Johns Hopkins University Press, 1997).

<sup>21</sup> Steven Harold Hochman, “Thomas Jefferson: A Personal Financial Biography,” PhD diss., (University of Virginia, 1987), 273.

<sup>22</sup> In contrast to this region, which includes Virginia, Maryland, and part of North Carolina, Fordham engages with the climate theory of race to describe the southern states. These areas, he declares, “must be cultivated by blacks or abandoned. The heat there is so excessive in August that to walk a mile in the Sun would subject a European to the most imminent danger....The Thermometer I think would be as high as 90 in the shade. I could not venture out in the Sun without suffering for my imprudence, now I am in ill health.” Elias Pym Fordham, *Personal Narrative of Travels in Virginia, Maryland, Pennsylvania, Ohio, Indiana, Kentucky; and of a Residence in the Illinois Territory: 1817-1818*, edited by Frederic Austin Ogg (Cleveland, OH.: Arthur H. Clark Company, 1906), 67. See also note 3.

to do so for the next twenty years. This is all the more remarkable given that slaveholders, such as Landon Carter in the eighteenth century, observed that slaves often grew weak and ill over the winter.<sup>23</sup>

The answer to this phenomenon lies in the region in which these people were enslaved. The cold waters of the cold south produced fish with higher quantities of fat, which held significant quantities of vitamin D. The grasses that sprouted beneath the pines and oaks were substantial enough to promote large quantities of milk in cows, a food dense with calories and vitamin D. Enslaved people had more access to more of these foods compared to poor white American and freeborn Black Americans. The cold decade also ushered in a shorter growing season. After the age of five, enslaved children in the cold south were required to work. A longer winter meant more time to recover from the harvest season. The more time children have to rest and recover, the more likely they are to grow and develop along our modern standards.<sup>24</sup>

The benefits of this phenomenon, which I call the Virginia increase, were short-lived. Following the end of Revolutionary War, settlers across the cold south began to migrate in droves to the warm south.<sup>25</sup> During the cold decade, cold-south slaveholders were able to pursue this migration because the health of their more long-term investments suddenly increased tremendously. Infants alone saw a marked decrease in mortality in this period, suggesting that

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<sup>23</sup> Though many Americans tended to grow ill over the winter, because of dwindling food stocks, and the impact of winter-specific environmental aspects, such as lower indoor air circulation and smoke build up from indoor fires, slaves who worked outdoors and in large barns also succumbed to what Landon Carter called “the winter disorders.” Landon Carter, *The Diary of Colonel Landon Carter of Sabine Hall, 1752-1778*, ed. Jack P. Greene, Vol. 1 (Charlottesville, VA.: University Press of Virginia, 1965), 369.

<sup>24</sup> Deborah Ocken, “The Effects of Exercise on Growth of Rats Recovering from Early Undernutrition,” (MA thesis., Kansas State University, 1988), 34. Wilma Dunaway, *The African-American Family in Slavery and Emancipation* (Cambridge: Cambridge University Press, 2003), 112-114. For more on the lives of enslaved children, see Wilma King, *Stolen Childhood: Slave Youth in Nineteenth-Century America*, 2nd ed. (Bloomington: Indiana University Press, 2011).

<sup>25</sup> The cascade of events following the Tambora eruption in 1816 triggered a similar pattern of migration from the east coast to the west around the same period. I suspect that the cold decade’s climatic events, which throttled the profit and prospects American farmers on the eastern seaboard, also helped to initiate this wave of migration. Wood, *Tambora: The Eruption that Changed the World*, 215-220.

the long winters allowed enslaved mothers to rest more and provide for infants in ways they could not before and after that period.<sup>26</sup>

Slaveholders who remained in the cold south were inclined to continue the conditions that allowed enslaved children to gain good health. Thus, their good health helped to fuel the expansion of the domestic slave trade from the 1830s onward. Drawing testimony from the interviews with former slaves born for the most part between the 1820s and 1850s unveils the consequences of the cold decade on the work schedules in the cold south. The strategies used by both slaves and slaveholders to cushion the impact of winter on enslaved African-Americans promoted better health, and as children and adolescents grew taller, their value on the slave market also increased.

The domestic slave trade was the market in which enslaved African-Americans, as well as enslaved Africans earlier on, were traded within the slaveholding U.S. Historian Steve Deyle offers the American Revolutionary War as the starting point for the market in which slaveholders began to sell their slaves as a profit source in and of itself.<sup>27</sup> It was amid the war that Virginia banned the importation of enslaved Africans, *en suite* with other previously slaveholding states in the northern U.S.<sup>28</sup> The reason Virginia, which still relied heavily on slave labour, could ban importation was because enslaved Virginians were no longer dying at rates that exceeded the number of children born into slavery.<sup>29</sup> Virginian slaveholders were in the unique position that they did not need to source additional labour outside of their state borders. Furthermore, enough

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<sup>26</sup> Richard Steckel, "Slave Mortality: Analysis of Evidence from Plantation Records." *Social Science History* 3, no. 3 (1979): 92, table 2.

<sup>27</sup> Steven Deyle, *Carry Me Back: The Domestic Slave Trade in American Life* (Oxford: Oxford University Press, 2005), 21-22.

<sup>28</sup> Deyle, *Carry Me Back*, 23.

<sup>29</sup> Richard S. Dunn, *A Tale of Two Plantations: Slave Life and Labor in Jamaica and Virginia* (Cambridge, MA.: Harvard University Press, 2014), 24-25; Fogel, *Without Consent or Contract*, 123-125; Morgan, *Slave Counterpoint*, 93.



children were surviving their childhood that late eighteenth-century slaveholders could sell these slaves to the slaveholders expanding into the western territories that would become Kentucky, Tennessee, and Missouri.<sup>30</sup>

Westward expansion built the foundations upon which the domestic slave trade would grow in the nineteenth century. Michael Tadman estimated that between 1800 and 1809, around 65,791 slaves were forced across state lines (see table 2).<sup>31</sup> That number nearly doubles to 123,386 in the subsequent decade. The jump is only matched by the jump from the 1820s to the 1830s. Slavery scholars pinpoint the 1820-30 period as the beginning of the domestic slave trade that drove the traffic of enslaved people from the cold south to the Black Belt region of the warm south. Yet, the jump in numbers from the 1810s exceed the jump from the 1820 to 1830 period by 3%.<sup>32</sup> The 1810s then represent a significant turning point in the growth of the domestic slave trade. As enslaved African-Americans gained a measure of health, and sustained it, and changes in agricultural and production practices fueled southward migration, cold-south slaveholders saw the beginnings of a market nearly as lucrative as cash crops cultivated by unfree labour.

Table 2 Percentage increase in the sale of slaves in the domestic U.S. market from 1790 to 1860.

<b>Decade</b>	<b>Percentage increase between</b>
1790s-1800s	32.88%
1800s-1810s	87.54%
1810s-1820s	25.39%
1820s-1830s	84.05%

<sup>30</sup> Deyle, *Carry Me Back*, 283-289.

<sup>31</sup> Michael Tadman, *Speculators and Slaves: Masters, Traders, and Slaves in the Old South* (Madison, WI.: University of Wisconsin Press, 1989), 12.

<sup>32</sup> Tadman, *Speculators and Slaves*, 12.

1830s-1840s	35.42%
1840s-1850s	36.34%

Sources: Data taken from Michael Tadman, *Speculators and Slaves: Masters, Traders, and Slaves in the Old South* (Madison, WI.: University of Wisconsin Press, 1989), 12

The Virginia increase did not appear only as a function of climate change. Rather, the effects of this climate change amplified an existing baseline of health. In 1974, Robert Fogel and Stanley Engerman published their seminal *Time on the Cross*, one of the first quantitative histories of American slavery.<sup>33</sup> Fogel and Engerman dedicated an entire chapter to slave diet and provided quantitative evidence for the argument that slaves had received adequate rations.<sup>34</sup> Their numbers demonstrated that the average slave consumed enough calories to exceed the average caloric intake of the free population in 1879, enough to survive labour demands.<sup>35</sup> *Time on the Cross* also triggered further research into the topic of general American slave health. Many of these studies into slave health were comparative. They analyzed health markers, such as height, of American slaves and set these numbers against those of slaves from the West Indies as well as against the modern standard for adult and children height.<sup>36</sup>

The group of scholars who propelled this deep dive into slave health were concerned with establishing a baseline of health for each slave in the American antebellum south, and so they did, using height as the primary indicator of health. Using nineteenth-century plantation records and ship manifests to collate the average height of slaves from childhood into adulthood,

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<sup>33</sup> Robert William Fogel and Stanley L. Engerman, *Time on the Cross: The Economics of American Negro Slavery*, new ed. (New York: Norton, 1989).

<sup>34</sup> Fogel and Engerman, *Time on the Cross*, 113.

<sup>35</sup> These claims related to the average slave on a large plantation in the warm south in 1860. Fogel and Engerman, *Time on the Cross*, 111.

<sup>36</sup> Kiple and King, *Another Dimension to the Black Diaspora*; Robert A. Margo and Richard H. Steckel, "The Heights of American Slaves: New Evidence on Slave Nutrition and Health." *Social Science History* 6, no. 4 (1982): 516-538; Richard Steckel, "Slave Height Profiles from Coastwise Manifests," *Explorations in Economic History* 16, no. 4 (1979): 363-380; Steckel, "A peculiar population," 721-741; Steckel, "Work, Disease, and Diet," 489.

historian Richard Steckel found that beginning from the age of five enslaved children in the antebellum U.S. South suffered from stunted height and weight until they were around ten years old.<sup>37</sup> Later, Fogel elaborated on this work.<sup>38</sup> The average height of enslaved children increased around the age of five or six and then followed a final cycle of decrease and increase through the age of ten and into adolescence, from which their height remained on a permanent incline (see fig. 1). The numbers have not yet been challenged, even as some remain estimates.<sup>39</sup> Few of these health studies have attempted to interpret these numbers on a regional basis, focusing instead on establishing a baseline representation of overall American slave health.

This thesis will attempt to contribute a dietary and environmental context to the Virginia increase. When former slave Eli Davison observed that the slaves around him did not try “to run off in Texas, ‘cause this was good country, plenty to eat by huntin’ and not so cold like in Virginia,” he was eluding to the real climate differences that influenced the conditions of enslavement in the U.S.<sup>40</sup> The location of a slaveholding was a determining factor in the health of an enslaved person.<sup>41</sup> Geography, along with market prices, guided the type of crop a slaveholding would grow, influencing the labour demands required of the enslaved labourers. Cash crops such as cotton were not as taxing and time-consuming as sugar agriculture, but it was

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<sup>37</sup> Ibid, 489-501.

<sup>38</sup> Fogel, *With Consent or Contract*, 138-142.

<sup>39</sup> For more recent studies of slave height, see the work of Scott Carson and Eric Schneider. Scott Alan Carson, “Institutional Change and Variation in 19th-century Southern Blacks’ and Whites’ Body Mass Indices,” *Journal of Institutional and Theoretical Economics* 170 (2014): 296-316; Eric B. Schneider, “Children's growth in an adaptive framework: explaining the growth patterns of American slaves and other historical populations,” *Economic History Review* 70, no. 1 (2017): 3-29.

<sup>40</sup> *The American Slave: A Composite Autobiography*, ed. George Rawick, Vol. XVI, Part 1, (Westport, Conn. Greenwood Pub., 1972), 296. Hence forth these titles from the first series will be formatted as AS:16:1:296. Titles from the supplement series will be cited with the additional “SS1” or “SS2.”

<sup>41</sup> The conditions of slavery could differ depending on the labouring demands of the slaveholding. Adrian Miller described three important labouring contexts as “urban slavery; small-scale, yeoman farm slavery; and large-scale plantation slavery.” Miller, *Soul Food*, 38. For the representative compendium on how location could change the conditions of enslavement, see Philip D. Morgan, *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake and Lowcountry* (Chapel Hill, NC.: University of North Carolina Press, 1998).

more time-consuming than the cultivation of tobacco. Ranking at the bottom is the cultivation of wheat, which required less labour for production and less time overall.<sup>42</sup>

As previous studies of slave health have shown, the growth of the average enslaved child was delayed twice through childhood and adolescence. Could vitamin D deficiency explain this phenomenon?<sup>43</sup> Humans can obtain vitamin D from two main sources, sunlight and animal food sources.<sup>44</sup> Similar to photosynthesis, humans synthesize vitamin D through the conversion of 7-dehydrocholesterol (7-DHC) to the previtamin D.<sup>45</sup> Once absorbed through the skin, the pre-vitamin enters the bloodstream where it synthesizes into vitamin D. Fully formed, it travels to the liver and then the kidney to be metabolized, or activated in order to perform its multiple functions within the body. Melanin can slow the process of absorption, so, those with more

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<sup>42</sup> Morgan, *Slave Counterpoint*, 170-175; Justin Roberts, *Slavery and the Enlightenment in the British Atlantic* (New York: Cambridge University Press, 2013), 92.

<sup>43</sup> Vitamin D is considered in the context of the influence of statistical noise on this height data. The variation in the conditions of enslavement across regions was likely responsible for the plateau in the data. Without controlling for the differences in enslavement on tobacco farms, which had short growing seasons with tedious work that wore away at the body, and rice plantations, whose stagnant waters and brutal labour demands generated lethal disease environments, it is difficult to generalize these growth patterns to each and every enslaved child. For more on the labour demands of tobacco farms in the tidewater and piedmont geographic regions, see Kulikoff, *Tobacco and Slaves*; Morgan, *Slave Counterpoint*; Drew A. Swanson, *A Golden Weed: Tobacco and Environment in the Piedmont South* (New Haven: Yale University Press, 2014). For more on the rice plantations across the lowcountry in South Carolina and Georgia, see William Dusbiberre, *Them Dark Days: Slavery in the American Rice Swamps* (Oxford: Oxford University Press, 1996); Morgan, *Slave Counterpoint*.

<sup>44</sup> There are two final forms of vitamin D. Cholecalciferol, or vitamin D3, can be synthesized or found in animal food products, and ergocalciferol, or vitamin D2, can be synthesized or found in certain non-animal food sources, such as yeast (in its raw form—often dissolved or fermented in water) and mushrooms. This paper will focus only on vitamin D3. The form of vitamin D humans convert from sunlight is vitamin D3. This form is the most bioavailable for humans, meaning that it is the best useable form. Experimental studies that have found correlations or cause and effect from vitamin D supplementation rely in most part on the D3 form. In addition, the WPA interviewees do not mention foraging or cultivating mushrooms, nor do they mention consuming yeast. They do, however, mention, again and again, consuming animal fat. Alexandra Schmid and Barbara Walther, “Natural vitamin D content in animal products.” *Advances in nutrition* 4, no. 4 (2013): 454; Lori A. Smolin, Mary B. Grosvenor, and Debbie Gurfinkel, *Nutrition: Science and Applications*, 2<sup>nd</sup> Canadian ed. (Mississauga, ON.: John Wiley & Sons, 2015), 386; Ann R. Webb and Michael F. Holick, “The role of sunlight in the cutaneous production of vitamin D3,” *Annual review of nutrition* 8, no. 1 (1988): 378. It should be noted that today humans can also obtain the isolated supplement of D2 and D3.

<sup>45</sup> Smolin, Grosvenor, and Gurfinkel, *Nutrition*, 386-388; Webb and Holick, “The role of sunlight,” 378-380.

pigmented skin require more intense sunlight, or precisely UV radiation, to form the previtamin D.<sup>46</sup>

Animal food sources contain the fully formed vitamin, allowing it to be metabolized once ingested. However, aside from a select few foods rich in fats, most animal food sources do not make great contributions to the daily circulatory level of vitamin D.<sup>47</sup> One of the functions relevant to this discussion is vitamin D's role in calcium and phosphate homeostasis. These two minerals are necessary for the growth and maintenance of a healthy skeletal structure.<sup>48</sup> Vitamin D assists in their absorption in the gut and regulates the availability of calcium in the blood. Without sufficient levels of vitamin D, children can develop bone diseases, such as rickets, which impact their growth pattern.<sup>49</sup>

Kenneth Kiple and Virginia Himmelsteib King's 1982 study of enslaved children's nutrition attempted to estimate levels of vitamin D in the average enslaved child.<sup>50</sup> Without much discussion, Kiple and King presumed that rickets ran rampant among enslaved, as well as modern-day, African-American populations. They pointed to the sheer number of antebellum runaway slave advertisements that mentioned individuals that were "bowlegged" or "knock-kneed"—one indication of a childhood deficiency of vitamin D. However, rather pointing to an ongoing absence of vitamin D, these skeletal signs tell us that these deficiencies were occurring

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<sup>46</sup> Age is another factor in previtamin D formation. At the age of 80, one can only generate about half the amount of previtamin D as someone 20 years old. Scott Alan Carson, "Institutional Change, Geography, and Insolation in Nineteenth Century African- American and White Statures in Southern States," *Journal of Economic Issues* 44, no. 3 (2010): 740; Smolin, Grosvenor, and Gurfinkel, *Nutrition*, 390-391; Webb and Holick, "The role of sunlight," 382-383.

<sup>47</sup> Webb and Holick, "The role of sunlight," 389.

<sup>48</sup> Smolin, Grosvenor, and Gurfinkel, *Nutrition*, 388-389.

<sup>49</sup> The recovery of vitamin D deficiency also requires additional calcium of which enslaved children received plenty. See Chapter 2. Jaishen Rajah, Jamal A. Jubeh, Afrozul Haq, Amani Shalash, and Howard Parsons, "Nutritional rickets and z scores for height in the United Arab Emirates: To D or not to D," *Pediatrics International* 50, no.4 (2008): 424-428; Francesca L. Crowe et al., "Vitamin D for Growth and Rickets in Stunted Children: A Randomized Trial," *Pediatrics* 147, no. 1 (2021): 1-9.

<sup>50</sup> Kiple and King, *Another Dimension to the Black Diaspora*, 104-106.

at older stages of growth, such as 15 to 23. At these ages, slaves were considered adults, old enough to work full, long, and arduous hours, and it is difficult to parse the exact causes, particularly in the cold south where more enslaved labourers worked indoors, in barns or factories, than in the warm south.<sup>51</sup>

In his discussion of African-American foodways, Robert Hall mentions the importance of vitamin D, stating that “the combination of having darker complexions and seasonal cycles of overcast weather and indoor work may have militated against the bodily production of optimum levels of Vitamin-D.” In contrast to his statement about overcast weather, even if one is located at northern latitudes, even during sunnier days, UV radiation cannot be used for vitamin D synthesis in the winter months.<sup>52</sup> This thesis will attempt to quantify the levels of vitamin D circulating in the blood serum levels of enslaved children in the winter by estimating the dietary amounts of the vitamin they likely consumed. Where this project deviates from previous studies examining the potential impact of vitamin D on slave health is in its focus on the northern slaveholding states of Virginia, Maryland, and North Carolina.

Narrowing the population group to the region of the cold south and remaining sensitive to environmental changes over time will in fact allow us to refine our understanding of general slave health. Virginia was a major exporter of slaves to the domestic slave trade through the nineteenth century. The Louisiana Purchase in 1803 from the French and increasing soil depletion from a culture of monocropping, land monopolization, and unstable market prices in

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<sup>51</sup> Drew Swanson traces the development of tobacco manufacturing in industrial-like factories to at least the 1820s. Drew Swanson, *A Golden Weed: Tobacco and Environment in the Piedmont South* (New Haven: Yale University Press, 2014), 68-72.

<sup>52</sup> He does touch on, without detail, the issue of regional difference, but references deficiencies brought on by the Great Migration after the First World War. Robert L. Hall, “Africa and the American South: Culinary Connections,” *The Southern Quarterly* 44, no. 2 (2007): 38.

tobacco and wheat in the cold south encouraged settlement further west as well as south.<sup>53</sup> As slaveholders migrated south with their slaves, they required more of slaves to create and upkeep their rural plantation. They sourced these slaves in large part from Virginia and the trade continued into the 1860s.<sup>54</sup> Despite the constant trafficking of slaves from Virginia, by the outbreak of the Civil War in 1860, a quarter of the U.S. slave population resided in Virginia.<sup>55</sup> Investigating the health of enslaved children in Virginia, thus, does no small part in providing a picture of the health of younger and older slaves elsewhere in the slaveholding south.<sup>56</sup>

Those in the cold south had the advantage over children enslaved elsewhere. In Virginia, Maryland, and the more northern areas of North Carolina, seasons dictated their labouring schedule. The colder winter in these states meant that enslaved children could expect a period of rest following the Christmas season. But, through the eighteenth century, the climate in the cold south become more and more moderate, which meant longer growing seasons. The colder 1810s pushed the whole of the growing season so far back that many had to wait as late as June to begin the planting season. One of the tasks enslaved children in the cold south were expected to do was to assist during the planting season. With it being pushed so far back, and the harvest

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<sup>53</sup> Kulikoff, *Tobacco and Slaves*, 46-47; Lorena S. Walsh, "Slave Life, Slave Society, and Tobacco Production in the Tidewater Chesapeake, 1620-1820," in *Cultivation and Culture: Labor and the Shaping of Slave Life in the Americas*, eds. Ira Berlin and Philip D. Morgan (Charlottesville, VA.: University Press of Virginia, 1993), 173.

<sup>54</sup> The domestic trade had initially begun with cold-south slaveholders selling to slaveholders close to home. Belle Caruthers' mother was "brought from Virginia" to North Carolina. Joseph Allen's mother was "bot in fum Virginy" to Kentucky, where he had been raised as a slave. This network of Virginian slaves likely spread much of the regional cuisine developed there. Deyle, *Carry Me Back*, 31-35; AS:SS1:5:3; AS:SS1:6:1:364.

<sup>55</sup> Richard S. Dunn, *A Tale of Two Plantations: Slave Life and Labor in Jamaica and Virginia* (Cambridge, MA.: Harvard University Press, 2014), 68-69.

<sup>56</sup> As for Maryland and North Carolina, these two states share similar geographic regions to Virginia. Three geographic regions divide Virginia. The Appalachian mountains descend into the blue ridge mountain region in the west, which plateaus into the rolling hills of the piedmont of central Virginia and then lowers into the coastal plains of the eastern shore, also known as the tidewater. Both Maryland and North Carolina share the same piedmont and tidewater regions as Virginia and they also lie close to the latitudinal parallel, in contrast to South Carolina and Georgia, which also share similar geographic features while being located closer to the equator with much milder winters. I have borrowed the division of Virginia's regions from Howard Bodenhorn. Bodenhorn, "Height and Nutrition of Rural Free Blacks," 982fn32; Morgan, *Slave Counterpoint*, 30-31; Swanson, *A Golden Weed*, 20-21, 16-17.

season also shortened, slaves of all ages worked less hours. The increase in the winter lull, coupled with the regional diet of the cold south, encouraged the height increase of enslaved men born in the early nineteenth century.

Thomas Jones' testimony is just one of many that have been overlooked in the historical record regarding environmental changes in the U.S. South.<sup>57</sup> In part, this is the consequence of the limited sources of enslaved Black voices in the historical record. But this appears to have occurred because the debate about the intent behind the testimony of former slaves remains at the forefront of discussions about this testimony. Focusing solely on the motivations and intentions of what enslaved and former slaves say and said and how they felt about their enslavers sometimes obscures the ways in which the climate and the environment also effected change on the conditions of enslavement. Former slaves who recalled dramatic weather events, such as Jones or even Sarah Gudger, typically used these moments to emphasize the tyranny of the slaveholder who made them work in those conditions.<sup>58</sup> Thus, the awfulness of the immediate conditions takes precedence over the broader context. But we should take seriously these awful moments because climate change transformed the lives of the enslaved and slaveholders.

Former slave David Blount told of working on a day that was as “cold as de debil...One boy ast if he could warm by de bresh heap. De oberseer said no, and atter while de boy had a chill.”<sup>59</sup> That night the boy grew ill, and the doctor was called. When the boy told the slaveholder, William Blount, how he had caught pneumonia, Blount recounted that at this nameless boy's bedside he watched “de marster sorta turn white.” It was the first time that

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<sup>57</sup> Tony Perry is among the few slavery historians looking at how enslaved African-Americans dealt with the cold temperatures. Tony C. Perry, “In bondage when cold was king: the frigid terrain of slavery in antebellum Maryland,” *Slavery & Abolition* 38, no. 1 (2017): 23-36.

<sup>58</sup> We will see how the climate affected Gudger's conditions in Chapter 2. AS:11:1:355.

<sup>59</sup> AS:11:1:112.



Blount saw the slaveholder lose his temper. Blount's account reveals the value working boys held with slaveholders, but it also highlights how slaves and slaveholders had to consider their environmental surroundings. So, when Jones tells of the misery of his parents' conditions, when Lizzie Williams tells of how in the warm south her mother had to "wash standin' in sleet an' snow knee deep when her baby was just three days old," and when North Carolinian Sarah Gudger recounts how they would drag wood from the mountains in the winter and come home "wif ouh cloes stuck t' ouh poah ole cold bodies," these accounts make it difficult to parse the effects of climate from the wills and whims of the slaveholder.<sup>60</sup>

In his monograph on the 1815 Tambora eruption, historian Wolfgang Behringer dismissed the sociological method—that "it is in the nature of society itself that we must seek the explanation of social life"—often used in social histories. The method was inapplicable "when the conditions are set not by Napoleon or the bourgeoisie but by a volcano."<sup>61</sup> Likewise I will begin my next chapter by discussing the climatic events that made up the first half of the second decade and their effects on the economy. The latter half of the 1810s has been the subject of a few studies.<sup>62</sup> As such, my focus will be on the eastern seaboard of the U.S. and primarily on depicting the grain trade in this place before and during the War of 1812. I draw heavily from contemporary newspapers as well as Thomas Jefferson's writings to create this picture. The subsequent two chapters switch to a less chronological and more thematic exploration of slave diet and nutrition. These final two chapters will explore milk and oil fish, two foods neglected in the scholarship of historical African-American cuisine.

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<sup>60</sup> Lizzie Williams in AS:SS1:10:5:2336; Sarah Gudger in AS:11:1:352.

<sup>61</sup> Behringer, *Tambora and the Year without a Summer*, 3.

<sup>62</sup> For the most detailed study of the cold decade, see Michael Sean Munger, "Ten Year of Winter: The Cold Decade and Environmental Consciousness in the Early 19<sup>th</sup> Century," PhD diss., (University of Oregon, 2017).

I have used the 1930s' Works Progress Administration (WPA) interviews to establish the region-specific foods that were capable of supplementing vitamin D. These interviews with former slaves have had their reliability contested over the decades since the first publication of the collection in the 1950s. However, these interviews serve as a necessary complement to the antebellum slave narratives. The narratives did not seek to elaborate on the enslaved diet, except where it was lacking to thus underscore the harshness of slavery. The interviews, which allegedly paint a rather paternalistic depiction of slavery, contain much data on the slave diet. Recent studies of the WPA interviews have suggested that collecting data on less subjective commentary such as food and other objects may be more reliable than collecting data on family and other more emotional subjects.<sup>63</sup>

To this end, perusing the WPA interviews uncovers several foods that have not yet made it to the canon of African-American cuisine. As such, the interviews make the bulk of the evidence for my last two chapters. Chapter 3 examines the prevalence of milk in the diet of enslaved children in the cold south. While milk appeared in the interviews of people enslaved elsewhere, its prominence in the cold south is striking. Its prominence is even more remarkable given the historiographical thesis and modern-day myth that Black Americans cannot consume milk without digestive problems. This chapter will tackle this thesis-myth to establish that not only was the consumption of milk prevalent among enslaved children, but it was also one of the foods that bolstered the health of enslaved children following nutritional deprivation in infancy.

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<sup>63</sup> Sharon Ann Musher, "The Other Slave Narratives: The Works Progress Administration Interviews," in *The Oxford Handbook of the African American Slave Narrative*, ed. John Ernest (Oxford: Oxford University Press, 2014), 110-111. Robert Fogel also made use of the WPA interviews to assess slave diet, but he worked with the first set of volumes, which contained many transcripts that were edited in the inverse manner as the antebellum slave narratives. Fogel, *Without Consent or Contract*, 132-138.

Milk was drunk at least nine months out of the year and contributed to their baseline nutritional health, preparing enslaved children for the incoming winter.

Another crucial contribution to the health of enslaved children just before winter, and in particular, adolescents, was the increase in rations during the harvest season. Oily fish, like milk, is rarely discussed as a holdover from historical African-American cuisine. But, like milk, oily fish is known as a dietary source of vitamin D. The third and final chapter will delve into the oily fish consumption of enslaved adolescents during the harvest season and its impact on their health at a time when they were expected to work the hardest.

The food portion of this thesis concerns itself with rations as opposed to the foods that slaves themselves may have supplemented through hunting and fishing. As such, these foods do not directly reflect historical African-American cuisine as those enslaved did not choose what they were provisioned. Historian Christopher Farrish argues that rationing was “the system within which black food culture emerged” and by reducing “the act of eating to a metric of inputs and outputs, [it] shifted power away from the enslaved.”<sup>64</sup> However, even within the rationing system, slaves still exerted their agency by voicing and acting on their preferences regarding the foods they were provisioned. Rezin Williams, a Black man who was born free in 1820s Maryland, noted how “slaves as a rule preferred possums to rabbits. Some liked fish best.”<sup>65</sup> Formerly enslaved in West Virginia, Nan Stewart had liked best “waffl’s honey and

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<sup>64</sup> Christopher Farrish, “Theft, Food Labor, and Culinary Insurrection in the Virginia Plantation Yard,” in *Dethroning the Deceitful Pork Chop: Rethinking African American foodways from Slavery to Obama*, ed. Jennifer Jensen Wallah (Fayetteville, AR.: University of Arkansas, 2015), 156-157.

<sup>65</sup> AS:8:75.

stuffed sausage, but I spise possum and coon.”<sup>66</sup> Others exercised their preferences by reclaiming the foods they made and the livestock they cared for.<sup>67</sup>

The nutritional significance of milk and oily fish to slaves reveals that even as enslaved Africans were trafficked to shore, there were realities they had to contend with that were not quite understood by their European captors.<sup>68</sup> When the first Africans landed on the shores of the Chesapeake Bay, having initially disembarked in the Caribbean, they had to grapple with a moody and sometimes bitterly cold climate unlike their familiar and more straightforward sunny climate. Two hundred years later, in the nineteenth century, African-American slaves were still battling the North American winter.<sup>69</sup> But the winter they faced was one that many had not seen in decades, challenging late eighteenth-century theories that the white people were once more encouraging the climate to become more moderate.<sup>70</sup> The start of this cold decade is where this thesis will begin.

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<sup>66</sup> AS:12:87.

<sup>67</sup> Marrinda Jane Singleton in Charles L. Perdue Jr., Thomas E. Barden, and Robert K. Phillips, eds. *Weevils in the Wheat: Interviews with Virginia Ex-Slaves*, 2<sup>nd</sup> ed. (Charlottesville: University of Virginia Press, 1994), 266; Charles Grundy in *Weevils in the Wheat*, 116

<sup>68</sup> Seventeenth-century English settlers spent over a century suffering the cold New England winters in stark contrast to the indigenous peoples, such as the Wabanki, who welcomed and celebrated winter. For more on this dynamic, see Thomas Wickman, *Snowshoe Country: An Environmental and Cultural History of Winter in the Early American Northeast* (Cambridge: Cambridge University Press, 2018).

<sup>69</sup> See Perry, “The fridge terrain of slavery.”

<sup>70</sup> Wood, *Tambora: The Eruption that Changed the World*, 226-228.

## CHAPTER 2 A BUSHEL OF WHEAT

When Sarah Gudger, a former slave, was asked to recall significant moments of her life as a former slave, one memory of the depths of a North Carolina winter stood out. Gudger had been so hungry she crept “outen de do’ and walk barfoot in de snow, ‘bout two mile t’ mah ole Auntie’s house. I knowed when I git dar she fix hot cawn pone wif slice o’ meat an’ some milk foah me t’eat.”<sup>1</sup> Gudger was born in 1816 in the middle years of the cold decade. The cold decade was a period between 1810 and 1819 in which winter extended into the autumn and spring months in the northern hemisphere.<sup>2</sup> During these ten years, northern hemispheric temperatures plummeted by an average of 0.8 degrees Celsius, a temperature drop matched only by the beginning of the little ice age around the years 1250-1275.<sup>3</sup> Frosts extended into late spring and caught crops in the early fall, shortening the growing season in places which had been warmer areas in the previous century.

Prior to the 1810s, the cold south saw a general period of warming beginning in the late eighteenth century. In response to a question about climate change, Thomas Jefferson reminisced about the winters of his youth: “snows were frequent and deep in every winter; to my knee very often, to my waist sometimes, and...they covered the earth long.”<sup>4</sup> His weather observations during his presidency, from 1803 to 1809, noted the ground was covered in snow on average

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<sup>1</sup> AS:11:1:354.

<sup>2</sup> The eruptions brought about various climate events, but it is agreed that overall, the eruptions set back what had been the beginning of a gradual warming of the atmosphere by the late eighteenth century. Jihong Cole-Dai et al., “Cold decade (AD 1810-1819) caused by Tambora (1815) and another (1809) stratospheric volcanic eruption,” *Geophysical Research Letters* 36, no. 22 (2009): 1-6; Stefan Brönnimann et al., “Last phase of the Little Ice Age forced by volcanic eruptions,” *Nature Geoscience* 12, no. 8 (2019): 650-656.

<sup>3</sup> Ellen R. M. Druffel, Sheila Griffin, Desiree Vetter, Robert B. Dunbar, and David M. Mucciarone, “Identification of frequent La Niña events during the early 1800s in the east equatorial Pacific,” *Geophysical Research Letters* 42, no. 5 (2015): 1512-1519; Eduardo Moreno-Chamarro, Davide Zanchettin, Katja Lohmann, and Johann H. Jungclaus, “An abrupt weakening of the subpolar gyre as trigger of Little Ice Age-type episodes,” *Climate Dynamics* 48 (2017): 730, fig. 1b, 732, fig. 3h.

<sup>4</sup> Jefferson also recalled stories from the generation before him who remarked how “in their youth, the winters had been still colder, with deeper & longer snows.” Thomas Jefferson to Nathaniel Chapman, 11 December 1809.

sixteen days through December, January, and February.<sup>5</sup> In Britain, the last Frost Fair before the 1809-10 winter was in 1789.<sup>6</sup> During the 1810s, which brought mild winters punctuated with deep freezes and cold and dry springs, contemporaries looked back to the deep freezes of the century past. Often, they had to stretch back to the 1770s and 1780s.<sup>7</sup> The last time such a deep snow had arrived in Virginia was 1772.<sup>8</sup> For Jefferson, born in 1760 and writing in the 1800s, these winters were nothing like that which he had experienced in youth. How would he know that that same year would usher in ten years of winter?<sup>9</sup>

Sarah Gudger was born into enslavement a year after one of the largest volcanic eruptions in recorded history. In April 1815, a volcano, Mount Tambora, on Sumbawa Island, Indonesia, erupted. To understand the magnitude of the Tambora eruption, one must scale it against other eruptions: Tambora's eruption was greater than the eruption of Mount Vesuvius by a magnitude of ten.<sup>10</sup> Observers around the world remarked on its immediate effect, including Thomas Jefferson, halfway around the world in the eastern United States. Northern Europeans and new Englanders called the year following the eruption, 1816, "the Year without a Summer."<sup>11</sup>

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<sup>5</sup> Thomas Jefferson to Nathaniel Chapman, 11 December 1809.

<sup>6</sup> The Thames froze over in 1795-96, but there appears to be no record of a Frost Fair that year. William Andrews, *Famous Frosts and Frost Fairs in Great Britain: Chronicled from the Earliest to the Present Time* (London, George Redway, 1887), 54-59.

<sup>7</sup> One author, writing against the establishment of another national bank, referenced, as an analogy, a sudden frost in May 1794, "which destroyed extensively the fruits of the earth [and also] checked in some places the ravages of the *Hessian fly*." "No. XI," *Rhode-Island Republican*, 21 February 1811.

<sup>8</sup> Thomas Jefferson to Nathaniel Chapman, 11 December 1809.

<sup>9</sup> Sean Munger, "Ten Year of Winter: The Cold Decade and Environmental Consciousness in the Early 19th Century." PhD diss., (University of Oregon, 2017).

<sup>10</sup> Wolfgang Behringer, *Tambora and the Year without a Summer: How a Volcano Plunged the World into Crisis*, trans. Pamela Selwyn (Cambridge: Polity Press, 2019), 19-20; Brian Fagan, *The Little Ice Age: How Climate made History, 1300-1850* (New York: Basic Books, 2000), 169-170.

<sup>11</sup> Fagan, *The Little Ice Age*, 174-176; Gillen D'Arcy Wood, *Tambora: The Eruption that Changed the World* (Princeton, NJ.: Princeton University Press, 2014), 199-228.

This phenomenon has been discussed in the historical record, particularly the nations that border the North Atlantic Ocean.<sup>12</sup> Thomas Jefferson's meticulously kept weather records allowed historians to broach the effects of Mount Tambora's eruption on the southern U.S. However, little has been discussed about the impact of this eruption, the odd and cold weather that followed, on the enslaved Black population in the south. The lack of scholarship on this topic when discussing the U.S. seems particularly egregious given that, alongside farmers, enslaved people were among those who suffered most from the effects of odd climate. Working in fields for most of the year, people enslaved in the more rural cold south were especially vulnerable to a colder environment.

Yet, the cold decade in which the Mount Tambora eruption occurred was one which enslaved people seemed to have gained a foothold on their health—the average height of enslaved men increased. But twenty years later, in 1835, enslaved people would lose that foothold, their average height decreasing just as every other male American population group. What had occurred in the early 1810s to initiate the change? The climate events in the 1810s shortened the growing season in the cold south and all areas north of it. The shorter growing season persuaded slaveholders to focus on growing more wheat than tobacco. Tobacco was harvested in September and its seedlings were in constant danger of early June frosts. In contrast, wheat was planted in the autumn or spring and could be harvested in June. For slaves, the focus on wheat meant a longer resting period and less arduous growing season. As a result, enslaved children had the time to recover from summer labour, and this additional rest was the catalyst to the height increase that began in 1815.

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<sup>12</sup> Behringer's *Tambora and the Year without a Summer* focuses on the eruption's effect on Europe. For a global treatment of the year without a summer and its subsequent effects, see Wood, *Tambora: The Eruption that Changed the World*.

The shadow of Mount Tambora's eruption cast a long shadow on the period before it.<sup>13</sup> Environmental historians are now beginning to study the cold weather that beset North America and Western Europe in the 1810s. Archaeologist Brian Fagan pointed to three major volcanic eruptions in the decade, Soufrière on St. Vincent in the West Indies in 1812, Mayon in the Philippines in 1814, and Tambora in 1815.<sup>14</sup> These set of eruptions led historian Gillen D'Arcy Wood to call the cold decade, the cold "volcanic" decade. Indeed, these eruptions appear to have magnified a century-old obsession with volcanoes (see fig. 1).<sup>15</sup> Historian Wolfgang Behringer likewise agrees that the eruption of Tambora occurred in the context of a deepening cold weather pattern in the Atlantic world.<sup>16</sup> Most significantly, Wood argued that "Tambora's violent impact on global weather patterns was due, in part, to the already unstable conditions prevailing at the time of its eruption."<sup>17</sup> But as Wood concludes, "the celebrity of 1816...obscures the greater climatological and social history of the 1816, of which Tambora's eruption is the explosive centerpiece."<sup>18</sup>

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<sup>13</sup> The exception being historian Sean Munger's work. See Sean Munger, "The Weather Watchers: Amateur Climatologists and Environmental Consciousness, 1810-1820," *History of Meteorology* 7 (2015): 14-24.

<sup>14</sup> Fagan, *The Little Ice Age*, 169.

<sup>15</sup> Nicholas Daly, "The Volcanic Disaster Narrative: From Pleasure Garden to Canvas, Page, and Stage," *Victorian Studies* 53, no. 2 (2011): 255-285.

<sup>16</sup> Behringer, *Tambora and the Year without a Summer*, 20-21.

<sup>17</sup> Wood, *Tambora: The Eruption that Changed the World*, 37.

<sup>18</sup> *Ibid*, 41.





Figure 1 Joseph Mallord William Turner, *The Eruption of the Soufrière Mountains in the Island of St Vincent, 30 April 1812*, oil on canvas, Victoria Gallery & Museum, Liverpool, UK., <https://artuk.org/discover/artworks/the-eruption-of-the-soufriere-mountains-in-the-island-of-st-vincent-30-april-1812-67007>.

Tambora casts a long shadow on the history of Europe in the second decade of the nineteenth century, but the eruption—the cold decade as a whole—also impacted the slaveholding U.S. states.<sup>19</sup> Given that these states primarily profited from agriculture, and so their obsession with unfree labour, understanding how this weather pattern affected agriculture can assist us in understanding how early climate change affected enslaved persons living in the cold south. Furthermore, the cold decade was also witness to a profound change in economic realities for Americans. The trade embargoes enacted from 1807 to 1809 initiated a recession and encouraged many slaveholders to turn to mixed agriculture as opposed to focusing on a cash

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<sup>19</sup> Michael Sean Munger’s work brought together differing historical perspectives on the cold decade. But as one of the first works dedicated to the cold decade, Munger’s focus was necessarily to establish the historical significance of the period. Also, for the use of “Mountain X,” see Munger, “Ten Year of Winter.”

crop.<sup>20</sup> Others, however, fell upon wheat cultivation as embargoes and disastrous crop yields increased the price of wheat both in the U.S. and in Britain, at one time, one of the U.S.'s major trade partners.<sup>21</sup> In the cold south, though wheat harvests were impacted by the cold decade's characteristic trio of late frost, droughts, and storms, agricultural slaveholders fared better than the northern U.S. Still, the odd weather was motivation enough for many to migrate southward to a more familiar climate, and they brought their slaves with them.

These economic and social changes have been extensively documented. This chapter will first establish the catalyst for the cold decade, an 1808-09 volcanic eruption that further plummeted the already cold temperatures of the Little Ice Age, and then delve into the ensuing climatic events and their subsequent effects on agriculture and trade. Wood briefly narrated the effects of the 1815 eruption on the U.S., arguing that it was time to retire the "Year without a Summer...[and] reimagine the late 1810s in the United States as a multiyear period of extreme weather with cascading social and political effects."<sup>22</sup> Likewise, this chapter will attempt to argue that the social, political, and economic consequences of the 1808-09 eruption in the cold south helped to shape the conditions of enslavement for years to come. The best example of this transformation is the Virginia height increase that enslaved men experienced from 1815 to 1835. This height increase, I argue, began with the eruption of Mount X in 1808-09.

Climate scientists pinpoint the beginning of the cold decade to another significant volcanic eruption in 1808 or 1809.<sup>23</sup> The research regarding the time and place of this eruption is

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<sup>20</sup> Thomas Jefferson to John Armstrong, 6 March 1809; Lorena S. Walsh, "Slave Life, Slave Society, and Tobacco Production in the Tidewater Chesapeake, 1620-1820," in *Cultivation and Culture: Labor and the Shaping of Slave Life in the Americas*, eds. Ira Berlin and Philip D. Morgan (Charlottesville, VA.: University Press of Virginia, 1993), 191.

<sup>21</sup> Donald R. Hickey, *The War of 1812: A Forgotten Conflict* (Urbana, IL.: University of Illinois Press, 1990), 20-21.

<sup>22</sup> Wood, *Tambora: The Eruption that Changed the World*, 200.

<sup>23</sup> There were reports in 1809 of Mount Etna's eruption in April, but Mount X was most likely a volcano in the tropics. "MOUNT AETNA," *Geneva Gazette*, 6 September 1809; "FOREIGN," *Virginia Argus*, 29 September 1809; "ERUPTION AT MOUNT AETNA," *National Intelligencer & Washington Advertiser*, 6 October 1809.

unclear. The consensus is that the eruption occurred in the tropical islands near what is now Indonesia.<sup>24</sup> The 1809-08 eruption was the sixth largest eruption in the past millennium, greater in magnitude than even the eruption of Krakatau in 1883.<sup>25</sup> Gillen Wood scales the magnitude of X's eruption on a timeline beginning in the 1400s, but the eruption ranks among those that, climate scientists argue, triggered the little ice age around 1250-1275.<sup>26</sup> Depending on their magnitude, these eruptions set in motion a number of sea ice-ocean feedbacks that can increase glacier formation and cloak the atmosphere with sulfur and ash particles, thus plummeting temperatures across the globe. Although the 1808 eruption does not appear to have been as great in magnitude as Mount Tambora, it triggered several effects that contributed to a period of global cooling and, alternatively, widespread drought. Its effects initiated the cooling temperatures further reinforced by Tambora's eruption.<sup>27</sup>

It is difficult to pinpoint an exact date using European and North American newspapers as historical records. Unlike the 1815 eruption of Mount Tambora, reports are much scarcer on a large-scale eruption occurring in 1808. One seemingly consequential eruption was reported in the Virginian newspaper, the *Alexandra Daily Gazette*. The Gazette reprinted a letter from an American consul in the Azores islands in Portugal. The consul described a volcanic eruption that began on May 1, 1808, on St. George Island from which "a dense column of smoke [rose] to an

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<sup>24</sup> Precise details are scarce as such investigations are often assisted by historical sources, of which there is little compared to the investigations into Tambora's eruption. Some argue that the eruption occurred in late 1808. Others place the eruption in 1809. A. Guevara-Murua et al., "Observations of a stratospheric aerosol *veil* from a tropical volcanic eruption in December 1808: is this the *Unknown* ~ 1809 eruption?" *Climate of the Past* 10, no. 5 (2014): 1707-1722; Claudia Timmreck et al., "The unidentified volcanic eruption of 1809: why it remains a climatic cold case," *Climate of the Past* 17, no. 4 (2021) 1455-1482.

<sup>25</sup> Timmreck et al., "The unidentified volcanic eruption of 1809," 1456; Wood, *Tambora: The Eruption that Changed the World*, 37.

<sup>26</sup> C. F. Schleussner and G. Feulner, "A volcanically triggered regime shift in the subpolar North Atlantic Ocean as a possible origin of the Little Ice Age," *Climate of the Past* 9 (2013): 1321-1330. DOI:10.5194/cp-9-1321-2013.

<sup>27</sup> Gregory J. Hakim et al. "The last millennium climate reanalysis project: Framework and first results," *Atmospheres* 121, no. 12 (2016): 6759; Timmreck et al., "The unidentified volcanic eruption of 1809," 1456.

immense height.”<sup>28</sup> Similar to reports from the British Indonesian islands, the consul initially believed the sound of the eruption to be “the report of heavy cannon at a distance.” However, the Azores islands sit off of the coast of western Europe in the middle of the Atlantic, closer to the thirty-ninth parallel than to the equatorial line.

Tracing the effects of the eruption to at least spring 1809 suggests that the eruption likely occurred earlier than December 1808. The pattern of climate events that followed Mount X’s eruption suggest that X drastically changed the climate in western Europe and North America. It seems to follow then that X likely erupted in April 1808 rather than December 1808. One gentleman living in Ohio declared that “for the last nine months, our seasons have been unlike any thing hitherto known in this country.”<sup>29</sup> He had experienced thunderstorms through the winter and torrents of rain that flooded nearby structures and drowned livestock. His proclamations suggest that the unusual climate events that marked 1809 and onward began in winter 1808-09.

The agricultural consequences of Mount X’s eruption came into full force across the eastern U.S. in the spring of 1809. Late frosts in the north and in the cold south marked that spring.<sup>30</sup> In a letter to James Madison dated March 17, Thomas Jefferson wrote of having ridden through “as disagreeable a snow storm as I was ever in.”<sup>31</sup> He claimed the spring to be “remarkably backward. no oats sown, not much tobacco seed, & little done in the gardens, wheat has suffered considerably. no vegetation visible yet but the red maple, weeping willow & Lilac.”

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<sup>28</sup> “New Volcano,” *Alexandria Daily Gazette, Commercial & Political*, 25 February 1809.

<sup>29</sup> “Extract of a letter dated in April last, from a gentleman in Cincinnati, [Ohio] to his friend in Philadelphia,” *Alexandria Daily Gazette, Commercial & Political*, 7 June 1809.

<sup>30</sup> In Buffalo, New York, the cold persisted through the spring. On June 2, one observer reported that the ice on Lake Erie had yet to break, remaining “thick and in a solid state.” The author of the report, Watchman, noted that “the navigation of this lake is stated to be open several weeks earlier, in moderate seasons.” *Virginia Argus*, 27 June 1809.

<sup>31</sup> Thomas Jefferson to James Madison, 17 March 1809.

Heading into the month of May, there seemed no end to the odd weather. The Ohio author noted how April was still “intensely cold.”<sup>32</sup> At the end of April, Jefferson wrote to Madison, “Our spring continues cold & backward. Rarely one growing day without two or three cold ones following. Wheat is of very various complexions from very good to very bad...Gardens are nearly a month behind their usual state.”<sup>33</sup> Jefferson was not forthcoming about the extent of damage from the frosts. Of the tobacco crops had been planted by then in Monticello, the April frosts had killed one to two thirds.<sup>34</sup>

To Jefferson, at least, the late spring seemed to portend the character of the incoming growing season. Through James Madison, he procured squash seeds from Maine—a strategy that would allow this variety of squash to grow through colder winters than the Virginian varieties with which Jefferson was familiar.<sup>35</sup> For others, the odd March weather seemed to be just a dramatic but momentary event. As the frosts continued from March into May, they injured whatever crops eager cold-south farmers and slaveholders had struck out in March. A letter to the editor of Virginia’s *Enquirer* complained that the “quantity of refused Tobacco has been very considerable, owing to the injury sustained to the Crop by the Frost.”<sup>36</sup> In the *Delaware Gazette*, an assessment of the fall grape harvest in Maryland noted the “material injury” done to the first yards by the “late frosts last spring and the uncommon drought during the summer.”<sup>37</sup> In May,

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<sup>32</sup> “Extract of a letter dated in April last, from a gentleman in Cincinnati, [Ohio] to his friend in Philadelphia,” *Alexandria Daily Gazette, Commercial & Political*, 7 June 1809.

<sup>33</sup> Thomas Jefferson to James Madison, 27 April 1809.

<sup>34</sup> Thomas Jefferson to George Jefferson, 1 May 1809.

<sup>35</sup> Jefferson had a fervent interest in agricultural experimentation. In 1805, he acquired winter melon seeds that had originated in Malta. But these necessitated planting in July and harvesting before frost. The gardeners with whom he left the seeds were only just successful. Admitting in correspondence in 1810 that the melon had not done well in Virginia, Jefferson sent the seeds to a South Carolina judge, William Johnson, noting that the plant “will be more likely to do well with you than here.” Thomas Jefferson to William Johnson, 17 March 1810; Munger, “Ten Years of Winter,” 46-47.

<sup>36</sup> “To the editor of the Enquirer,” *Enquirer*, 9 June 1809.

<sup>37</sup> “The Grape,” *Delaware Gazette*, 25 November 1809.

the *Rhode-Island Republican* printed an editorial on how to best preserve fruit trees from late frosts.<sup>38</sup> Similar observations were reported as far south as Arkansas. Virginia's *Enquirer* newspaper reprinted a letter from an Arkansas slaveholder sent in December 1809, who complained that the growing season "was remarkably dry and unfavorable" and implied a "light early frost" had touched his spring crops.<sup>39</sup>

Thomas Jefferson's apprehensions, as well as his consistent weather records, likely allowed him and his daughter, Martha Randolph Jefferson, who also ran Monticello, to avoid significant financial harm for the first few years of the 1810s.<sup>40</sup> In some ways, Monticello's location allowed the plantation to skirt the edge of danger. Sitting near the Blue Ridge region, just where the Appalachian Mountains descend into the rolling hills of the piedmont, Jefferson was not unfamiliar with dramatic changes in weather. However, his letters and dutiful weather records demonstrate an awareness that the typical climate seesaw he had seen in decades past was nothing compared to what he went on to witness through his stays at Monticello and Poplar Forest through the cold decade.

By May 1809, little rain had fallen south of the thirty-ninth parallel in South Carolina. The *Charleston Courier* declared the weather as "uncommonly dry for some past weeks... The cisterns generally are exhausted, and the wells have but a scanty supply of water."<sup>41</sup> This declaration, reprinted in the *Alexandra Daily Gazette* anticipated a summer on the eastern seaboard marked with drought and sudden tornadoes, hailstorms, and earthquakes. At the end of

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<sup>38</sup> "A method to preserve fruit trees from the effect of frost," *Rhode-Island Republican*, 31 May 1809.

<sup>39</sup> Though the gentleman did not declare himself a slaveholder, he pointed the blame for the lack of large yields of cotton to the lack of "hands in its cultivation than from any deficiency in the soil or climate." "Copy of a letter from a respectable gentleman, to his friend in Baltimore, dated Arkansa, Dec. 1809," *Enquirer*, 20 February 1810.

<sup>40</sup> Cynthia A. Kierner, *Martha Jefferson Randolph, Daughter of Monticello: Her Life and Times* (Chapel Hill: University of North Carolina Press, 2012), 147-149.

<sup>41</sup> *Alexandria Daily Gazette, Commercial & Political*, 8 May 1809.

June 1809, the *Virginia Argus* reprinted several columns from newspapers across the U.S. describing these major storms clustered around just one month.<sup>42</sup>

These odd events continued into August. In New York, just as would occur in 1816, the year without a summer, snow fell in August.<sup>43</sup> The wheat crops had already been damaged by the turn of cold weather preceding the snow, and the corn, “having been planted late,” the report deduced, “will turn out little or nothing.” Snow fell once more in Warren, New York, on September 9th.<sup>44</sup> The *Portland Gazette* also noted how the “summer has been uncommonly cold; and the crops of Indian Corn to the northward will be very scanty.” The same newspaper revised their opinion the following week, as “the few late days of warm weather has revived the almost perishing *Indian Corn* in several northern districts; but the fields in many places do not promise more than one third of a usual harvest.”<sup>45</sup> Despite the report’s optimistic outlook for the south, Arkansas slaveholders saw similarly low yields of corn.<sup>46</sup>

At first farmers and slaveholders wrote off the bad year. In regard to low crop yield, the Arkansas writer acknowledged that “all these things require time to mature.”<sup>47</sup> Writers to newspapers and letters between friends made frequent observations of the “uncommon” and “remarkable” weather in 1809. It was not until 1810 that these agriculturalist individuals began to realize that the uncommon year may not in fact end.

Early Americans were not unfamiliar with sudden climatic events, but the new pattern of drought and rain that followed the 1808 eruption encouraged farmers to test new agricultural

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<sup>42</sup> “Marietta, *Virginia Argus*, 27 June 1809; “Dreadful Hail Storms,” *Virginia Argus*, 27 June 1809; “Savannah,” *Virginia Argus*, 27 June 1809; “Earthquake,” *Virginia Argus*, 27 June 1809.

<sup>43</sup> “Remarkable Season,” *National Intelligencer & Washington Advertiser*, 25 August 1809; Behringer, *Tambora and the Year without a Summer*, 31-32.

<sup>44</sup> *Portland Gazette & Maine Advertiser*, 11 September 1809

<sup>45</sup> “The Season,” *Portland Gazette & Maine Advertiser*, 18 September 1809.

<sup>46</sup> “Copy of a letter from a respectable gentleman, to his friend in Baltimore, dated Arkansa, Dec. 1809,” *Enquirer*, 20 February 1810.

<sup>47</sup> *Ibid.*

patterns.<sup>48</sup> Those who found this new pattern as portentous as Thomas Jefferson headed south, joining several settlers who had already tested the Mississippi waters. The shifting subpolar low drove these new settlers to find, rather than create, the temperate conditions that had so harmonized with the cash crops of the eighteenth-century cold south.<sup>49</sup> But even areas as far as south as the Black Belt of Mississippi could not escape the climatic seesaw of the cold decade. However, if states like Virginia were hit, the cold decade hit western Europe harder. Even as the U.S. government issued embargoes in the run up to the War of 1812, the agricultural states could still make a profit from the smaller harvests. With steady profits from European droughts and crop blights, slavery in the southern states marched onward.

In the 1800s, rising tensions between the U.S. and Britain, as a result of tensions between Britain and France, gave way to a series of trade restrictions, championed by then President Thomas Jefferson. The Virginian grain trade decreased in volume beginning with the first embargo in 1806.<sup>50</sup> The U.S. ruled that no American goods or ships would leave their ports. As such, although merchants were undoubtedly smuggling goods in and out of the U.S., little records of clearance are available for 1807 and 1808.<sup>51</sup> After three years of consternation from farmers and merchants, and a deep economic recession, Congress lifted the embargo on March 4, 1809—Jefferson’s last day in office.<sup>52</sup> The external goods trade was sluggish in the aftermath. In all of 1809, only five ships cleared the port of Alexandria, Virginia, the centre of the grain trade in the state.

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<sup>48</sup> For more on how colonial and early Americans believed they could and should effectuate a more temperate climate through human intervention, see Anya Zilberstein, *A Temperate Empire: Making Climate Change in Early America* (Oxford: Oxford University Press, 2016).

<sup>49</sup> Zilberstein, *A Temperate Empire*, 150.

<sup>50</sup> W. Freeman Galpin, “The Grain Trade of Alexandria, Virginia, 1801-1815,” *The North Carolina Historical Review* 4, no. 4 (1927): 414-415.

<sup>51</sup> Donald R. Hickey, *The War of 1812: A Forgotten Conflict* (Urbana, IL.: University of Illinois Press, 1990), 20.

<sup>52</sup> Galpin, “The Grain Trade of Alexandria,” 418; Hickey, *The War of 1812*, 21-22.



But the harvest was not necessarily to blame. When agricultural interests wrote retrospectively on the harvest, their tone appears unburdened by the bad year. Low yields in domestic and foreign markets had translated into higher prices. Over the course of the strange summer of 1809, as well as 1810 and 1811, Thomas Jefferson chased a tenant, Jonathan Shoemaker, who had been leasing his mill. Shoemaker's letters to Jefferson depict the same climatic conditions reported in newspapers across the eastern seaboard. "The general Opinion," Shoemaker alleged on the first of August, "is that Produce of Every kind will be Low."<sup>53</sup> He was reluctant to make a decision about continuing his lease of the mill given trade prospects, particularly amid political and commercial tensions. Rather, Shoemaker proposed that rent be dependent on the price of flour. At the moderate price of 4\$, rent should be "800\$ per year if 5\$ then 1000\$ and if 6\$ then 1200\$ and so on."<sup>54</sup> Within three weeks, Shoemaker wrote to Jefferson to declare that fears on the grain trade had surprisingly subsided. In fact, a barrel of flour would fetch an excellent 5.75\$ at Alexandria and it appeared grain prices would remain high through the autumn.<sup>55</sup>

Agricultural slaveholders were frustrated by the lower yield, but the cold decade's effect on market conditions meant that whatever could be produced was enough to make a profit. The climate change initiated by the eruption of Mount X in 1808 produced wetter and colder conditions in western Europe. Wheat grew better in short periods of drought than in similarly timed periods of wet and cold. As such, the wheat harvests in the cold south were not so injured. Thomas Jefferson had been apprehensive about the wheat harvest, claiming in June 1809, just as despondently as Shoemaker, that it "at best can only be a midling [*sic*] crop."<sup>56</sup> But by the fall, it

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<sup>53</sup> Jonathan Shoemaker to Thomas Jefferson, 1 August 1809.

<sup>54</sup> *Ibid.*

<sup>55</sup> Jonathan Shoemaker to Thomas Jefferson, 18 August 1809.

<sup>56</sup> Thomas Jefferson to James Madison, 22 May 1809.

was the corn crop that had necessitated a more pessimistic outlook. Jefferson admitted that there “certainly will not be half a common crop [of corn]. It’s scarcity and price will produce infinite distress.”<sup>57</sup>

In comparison to the drought-stricken cold south, that summer Britain saw consistently wet and unfavorable conditions for cultivation of most grain.<sup>58</sup> One report printed on August 29 in the *Virginia Argus* remarked on a “long run of 4 to 5 weeks of cold unseasonable weather, by which the harvest must be retarded and rendered more precarious, but it is not supposed that the crops have yet sustained any actual injury.”<sup>59</sup> One month later, another report admitted that though the yield itself was of superior quality, the English wheat harvest was down one quarter to one third to the yield in 1808.<sup>60</sup> A year later, in August 1810, Britain saw no relief: “the prospect of our wheat harvest has by no means improved, the weather having been very wet and windy.”<sup>61</sup>

Britain’s need for grain was still quite large. Soldiers had to be fed, and the West Indian colonies where slavery was still practiced required provisions. Britain’s need was so great that much of the flour exported from Alexandria, Virginia, in 1809 was sent directly to England. When the embargo was struck down in March 1809, few ships left Alexandria, Virginia, to engage in trade with Britain.<sup>62</sup> Despite only the few ships sent to Britain, the total of barrels of flour shipped matched and superseded the number of barrels cleared annually between 1801 to 1803.<sup>63</sup> The constant wet weather meant that Britain’s water mills were in good shape. What

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<sup>57</sup> Thomas Jefferson to James Madison, 9 October 1809.

<sup>58</sup> “FOREIGN: FLOUR & GRAIN,” *Virginia Argus*, 13 October 1809.

<sup>59</sup> *Virginia Argus*, 29 August 1809.

<sup>60</sup> *National Intelligencer & Washington Advertiser*, 8 November 1809.

<sup>61</sup> “WASHINGTON, October 12,” *Enquirer*, 16 October 1810.

<sup>62</sup> Galpin, “The Grain Trade of Alexandria,” 418.

<sup>63</sup> *Ibid*, 424.

Britain and her colonies needed then, in the following year, was not milled flour, but wheat itself.<sup>64</sup>

Beginning in 1809, enslaved labourers worked to meet the domestic demand and demands of the market abroad and the amounts of bushels produced illustrate that labour. Lorena S. Walsh found that, between 1808 and 1815, an enslaved labourer in the tidewater and piedmont was expected to produce up to 71% more wheat than in preceding years.<sup>65</sup> This is a striking increase given the climatic events wreaking destruction over crops, repeated trade embargoes, and British forces encouraging the escape of enslaved people during the War of 1812.<sup>66</sup> The post-revolutionary era, from 1788 to the 1830s, was considered a period of prosperity for the grain trade. The agricultural efforts from the cold decade contributed prodigiously to the profitability of the trade.

As a result of ongoing climate crises throughout Europe and North America, the cold-south states were uniquely positioned and encouraged to produce large quantities of wheat. As a cash crop, wheat in the early nineteenth century required less labour than a crop like tobacco.<sup>67</sup> This meant that slaveholders did not need to purchase more slaves or hire a slave from another slaveholding to cover labour. Less people working alongside them meant more provisions to go around. More provisions per person translated, roughly, into healthier slaves.

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<sup>64</sup> In 1810, the number of barrels of flour cleared for England decreased by 82%. Bushels of wheat were suddenly in demand, jumping from zero cleared in 1809 to 16,216 bushels in 1810. Ibid, 424, 425.

<sup>65</sup> These numbers have been calculated from Lorena Walsh's data. The 71% increase relates to those enslaved in the more western regions of the piedmont. Those in the York and Rappahannock basin increased production by 39%. Slaves in the Eastern Shore would increase production by a more modest 7%. I have compared numbers from the period of 1808-15 to the period of 1790-99. Lorena S. Walsh, "Plantation Management in the Chesapeake, 1620-1820," *Journal of Economic History* 49, no. 2 (1989): 399.

<sup>66</sup> Taylor, *The Internal Enemy*, 200-205.

<sup>67</sup> Philip D. Morgan, *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake and Lowcountry* (Chapel Hill, NC.: University of North Carolina Press, 1998), 33; Justin Roberts, *Slavery and the Enlightenment in the British Atlantic* (New York: Cambridge University Press, 2013), 17; Walsh, "Slave Life, Slave Society, and Tobacco Production," 191.

Though slaveholders were reaping profits with wheat, they still dealt with a markedly shorter growing season. Reports from farmers across the eastern seaboard of the U.S. described another unnerving start to the growing season in 1810. Thomas Jefferson had taken note the year before and had not yet planted anything by late February. His apprehension was rewarded as a terrible deluge suddenly swept away all before its path, “the most devastating rain which has ever fallen within my knowledge [*sic*]. Three inches of water fell in the space of an hour...I have never seen the fields so much injured.”<sup>68</sup> Once more, Jefferson wrote in April, “our spring is wonderfully backward.”<sup>69</sup>

Jefferson’s observations were reflected in the ever-rising domestic price of wheat. In February 1810, Ohio’s *Huron Commercial Advertiser* reported that wheat could fetch between 50 to 60\$ a bushel.<sup>70</sup> By May, the price was between 60\$ to 65\$, an increase of 8% in just three months.<sup>71</sup> These increases reflected the ongoing impact of weather on crop yields. That June, Thomas Jefferson noted traces of frost in mountain country Virginia.<sup>72</sup> Even as frost endangered newly planted crops, the cold south, and even as far north as New Hampshire, suffered a long drought through midsummer.<sup>73</sup> When that rain did fall in June, Jefferson found relief at least in the fact that now all could “pitch his tob[acco] crop.”<sup>74</sup> Optimism aside, the tobacco yield still depended “on the length of the fall as well as the intermediate seasons.”

Detailing his experience with yields of corn through the summer of 1810, Mr. Ellicott from piedmont Virginia watched crop after crop of new corn suffer in the spring and replanted

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<sup>68</sup> Thomas Jefferson to William A. Burwell, 25 February 1810.

<sup>69</sup> Thomas Jefferson to James Madison, 16 April 1810.

<sup>70</sup> “HURON PRICE CURRENT,” *Huron Commercial Advertiser*, 11 February 1810.

<sup>71</sup> “HURON PRICE CURRENT,” *Huron Commercial Advertiser*, 26 May 1810.

<sup>72</sup> Thomas Jefferson, Weather recordings, 1782-1826, Coolidge Collection of Thomas Jefferson Manuscripts, Massachusetts Historical Society (hereafter cited as Jefferson weather recordings, Coolidge Collection).

<sup>73</sup> “DROUGHT,” *Virginia Argus*, 15 June 1810; *Enquirer*, 3 July 1810.

<sup>74</sup> Thomas Jefferson to James Madison, 27 June 1810.

them twice “and after all there were perhaps one tenth of the hills missing.”<sup>75</sup> The unusual weather, as well as less astute slaveholders and overseers, likely increased work for enslaved labourers across the slaveholding U.S. But this increase in work was confined to the planting time of the growing season. In the eighteenth century, seeds were sowed in late February and early March. Slaveholders likely pushed back the planting schedule entirely to May—particularly after the drought in February and March. Rain and snowfall had been so low that the river near Monticello was, according to Jefferson, “scarcely boatable.”<sup>76</sup> Sowing would begin in late March to early April, after the deluge of rain observed by Jefferson.

The growing season changed the work schedule for most crops on slaveholdings in the early nineteenth century. In the century previous, tobacco seedlings were transplanted from mulched seedbeds to the larger fields in April.<sup>77</sup> But as Jefferson wrote, with frost biting and killing crops as late as June, those who farmed had to wait until May at the very least to avoid frost and even June, depending on the rainfall over spring. Wheat, in contrast, was sown in autumn. The previously moderate Virginian winters and relatively predictable snowfall and frosts allowed wheat to grow through the winter for harvest in July.<sup>78</sup> But the cold decade’s late frosts continually threatened winter wheat just one month before it was due to reap, causing some slaveholders to lose from a quarter to a third of their yield. At this stage of growth, for wheat, there was little to be done to save the crop when frost crept forward in the early summer and gale-force winds tore through fields.<sup>79</sup>

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<sup>75</sup> “To Farmers,” *Alexandria Daily Gazette, Commercial & Political*, 30 October 1810.

<sup>76</sup> Thomas Jefferson to James Madison, 25 March 1810.

<sup>77</sup> Kulikoff, *Tobacco and Slaves*, 325; Morgan, *Slave Counterpoint*, 166-167.

<sup>78</sup> Morgan, *Slave Counterpoint*, 170-171.

<sup>79</sup> “TORNADO,” *Rhode-Island Republication*, 9 May 1810; “Hurricane of the 14th September,” *Alexandria Daily Gazette, Commercial & Political*, 15 October 1810; “DREADFUL CALAMITY,” *Enquirer*, 20 September 1811.

With replanting occurring now in June, the hours of enslaved individuals typically worked were crammed into a few shorter months. Because of the care necessary in replanting, slaves who worked in the field woke in the early morning and were finally allowed to rest as late as midnight. Former slave Thomas Jones related how his parents rose as early as three in the morning, worked until dark, and then returned home where they prepared “their food for supper and for breakfast of the next day, and attend to other duties of their own dear homes.”<sup>80</sup> They “snatch[ed] a few hours’ sleep, to get strength for the heavy burdens of the next day.”

Though wheat was the primary cash crop at this time, most slaveholders grew other cash items, such as tobacco and cotton. Thus, enslaved labourers may have had more time during the relative “off-season” in the cold decade, but they were still expected to work extensive hours from May to September--all the more so in 1810, when farmers and slaveholders were only just beginning to understand that the short growing season and continuous droughts were the new normal.

As it became clear that the 1810 growing season in the northern hemisphere would be as blighting as the 1809 season, participants in the North Atlantic Ocean trade grew nervous. In Surinam, the governor sought financial motivation to encourage the importation of provisions such as flour, rice, beans, and peas in the month of June. Spring droughts had plagued the Caribbean as well, bringing “great apprehensions of scarcity.”<sup>81</sup> The price of wheat remained high through the year. In July, midwest newspapers reported that the domestic price of wheat had risen to 66 dollars a bushel.<sup>82</sup> Britain’s wheat crop suffered at first from the same drought that

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<sup>80</sup> Thomas H. Jones, “The Experience of Rev. Thomas H. Jones” in *From Bondage to Belonging: The Worcester Slave Narratives*, eds. B. Eugene McCarthy and Thomas L. Doughton (Amherst, MA.: University of Massachusetts Press, 2007), 128

<sup>81</sup> “From a Barbados newspaper of the 24th ultimo.,” *Alexandria Daily Gazette, Commercial & Political*, 6 June 1810.

<sup>82</sup> Other grains, such as corn and oats, had also increased in price from May. “HURON PRICE CURRENT,” *Huron Commercial Advertiser*, 7 July 1810.

plagued the northern hemisphere and later succumbed to another wet and cold summer.<sup>83</sup> The droughts continued through the summer in Virginia, which allowed for a promising wheat harvest compared to crops like corn and compared to wet, cold Europe.<sup>84</sup> In a November issue of Virginia's *Enquirer*, an American writer in Livorno, Italy, declared, "no American produce seems to offer better prospects for the ensuing seasons, through these markets, than flour and grain."<sup>85</sup>

In October 1811, one author, writing a few months before Congress formally debated declaring war on Britain, warned, "a long cold winter is approaching."<sup>86</sup> In contrast to the political turmoil, the grain trade continued to be profitable through 1811 and even through the War of 1812. By 1812, most farmers had a grip on the pattern of climate events that shaped the first half of the cold decade. In the cold south, droughts and late frosts gripped the spring. Sudden deluges of rain and freak storms peppered late May and June, followed by another period of drought in the summer that could stretch well into the autumn.<sup>87</sup>

Armed, it seems, with an awareness of this climatic pattern, in April 1812, one author wrote of obtaining Siberian wheat seed, which, in England, had been sown on June 7 and had still yielded a good crop.<sup>88</sup> In the cold south, the author noted, the appropriate season to sow the wheat would be May 1, rather than the typical autumn sowing date.<sup>89</sup> The advice was an attempt to get ahead of what was by now a seasonal weather pattern. Just as Thomas Jefferson experimented with seeds from the northern U.S. as early as 1809, cold-south farmers

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<sup>83</sup> "Extract of a letter from a commercial house in Liverpool to another in this city, [New\_York] dated May 23," *Virginia Argus*, 13 July 1810; "WASHINGTON, October 12," *Enquirer*, 16 October 1810.

<sup>84</sup> "To Farmers," *Alexandria Daily Gazette, Commercial & Political*, 30 October 1810.

<sup>85</sup> "Communicated for the American. Extracts of a letter from an American gentleman at Leghorn, dated Aug. 30th," *Enquirer*, 20 November 1810.

<sup>86</sup> "War," *Alexandria Daily Gazette*, 16 October 1811.

<sup>87</sup> "Report of the Commissioners," *Enquirer*, 7 January 1813.

<sup>88</sup> "Interesting to farmers. On Siberian or Naked Wheat," *Alexandria Daily Gazette*, 2 April 1812.

<sup>89</sup> Morgan, *Slave Counterpoint*, 170.

acknowledged the shorter growing season by looking abroad for hardier crops. With wheat prices at such a premium, they were reluctant to let go of the profitable cash crop. Even as the cycles of drought, torrential rain, and more drought pressed the cold south.



Figure 2 Luigi Sabatelli I, *Vidi, quod aperuisset agnus... (The Four Horsemen of the Apocalypse)*, etching, 1809-1810, National Gallery of Art, Washington, D.C., <https://www.nga.gov/collection/art-object-page.157145.html>



These unsettling climate events continued into the cold decade. These unsettling events, as well as the past fifty years or so of constant conflict and warfare in the Atlantic, encouraged social anxieties. As one author proclaimed, “no age of the world has witnessed a greater variety of natural as well as moral phenomena, than that in which we live. We have become familiar with the narratives of Famines, Earthquakes, and Pestilences.”<sup>90</sup> Such interpretations of the future were heralded as far away as Italy. The Napoleonic period in Europe caused grain prices in Italy to go through high-low cycles through the first decade of the nineteenth century.<sup>91</sup> But just as prices stabilized in 1809, they skyrocketed in the next two years. Just as in Britain, odd climate events damaged the wheat harvest. It was in this context that premier Florentine painter, Luigi Sabatelli I, drafted his ominous sketch of the Four Horseman of the Apocalypse (see fig. 4). Drawing inspiration from a biblical verse in Revelations, Sabatelli attempted to make sense of the rising price of wheat.<sup>92</sup> Sabatelli’s visual interpretation of the climate phenomena, state conflict, and threat of famine likely would have lent comfort to the contemporary Christian onlooker.

The anxieties raised by the odd weather translated into real-world consequences for the enslaved in the U.S. south. In May and June 1810, the Isle of Wight county in Virginia was rocked with a slave conspiracy in which white inhabitants accused slaves of conspiring with North Carolinian slaves to gain their freedom through bloody conflict.<sup>93</sup> The conspirators had

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<sup>90</sup> “Sign of the Times,” *Alexandria Daily Gazette, Commercial & Political*, 13 May 1813.

<sup>91</sup> Of the five major commercial cities in Italy, grain prices in Milan showed the most modest increase, 43%. Giuseppe Felloni, “Monetary Changes and Prices in Italy in the Napoleonic Period,” *Journal of European Economic History* 5, no. 2 (1976): 383.

<sup>92</sup> The passage in question describes what will occur as the Four Horsemen emerge at the beginning of the Apocalypse: “I heard what sounded like a voice among the four living creatures, saying, “Two pounds of wheat for a day’s wage, and six pounds of barley for a day’s wages, and do not damage the oil and the wine!” Rev. 6:6.

<sup>93</sup> Alan Taylor, *The Internal Enemy: Slavery and War in Virginia, 1772-1832* (New York: W.W. Norton & Company, 2015), 134.

planned the night in question according to a forthcoming earthquake, so one slave alleged.<sup>94</sup> These anxieties congregated under the shadow of the Haitian Rebellion as well as Gabriel's rebellion, which occurred closer to home in 1800.<sup>95</sup> When a tragic fire in Richmond consumed the lives of seventy-two on December 26, 1811, Virginians pointed the finger at the surrounding slaves. The fire, they alleged, was "a signal for insurrection."<sup>96</sup> Anxieties around the investigation were likely influenced in no small part by a sudden earthquake that trembled through the coastal line from Alexandria to Raleigh, North Carolina five days after the fire.<sup>97</sup>

The unusual climate phenomena of 1809 and 1810 created an atmosphere of disquiet exacerbated by decades of global conflict. During the cold decade, it was not only anxieties about slaves that distorted how white slaveholders viewed slave life and politics, as historian Jason Sharples argues, but also anxieties about a changing climate.<sup>98</sup> So, amidst an alarming change in climate, both physical and in attitudes toward slavery, these Virginians articulated their concerns with their slave society by shifting the blame onto the enslaved themselves.

As for how the enslaved themselves spent these long winters, former slaves, such as Thomas Jones and Sarah Gudger, spent their early childhood years in mild to bitter winters that differed from the cold south in which eighteenth-century slaves were located. Gudger did not reap the tangential benefit of this shorter growing season. Her slaveholder was stingy with rations and with clothing, suggesting that unlike other slaveholdings who pushed through the crop failures, droughts, and shorter growing seasons, they did not bounce back and the consequences of this fell onto Gudger. Gudger's interviewer clearly challenges her on the point

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<sup>94</sup> Unidentified witness in Taylor, *The Internal Enemy*, 134.

<sup>95</sup> Taylor, *The Internal Enemy*, 94-97.

<sup>96</sup> Unidentified witness in Taylor, *The Internal Enemy*, 135.

<sup>97</sup> "A CARD," *Alexandria Daily Gazette, Commercial & Political*, 20 December 1811; "Earthquake," *Eastern Shore General Advertiser or Republican Star*, 31 December 1811.

<sup>98</sup> Jason T. Sharples, *The World that Fear Made: Slave Revolts and Conspiracy Scares in Early America* (Philadelphia, PA.: University of Pennsylvania Press, 2020) 19.

that her time enslaved left her “all cold n’ hungry,” leading Gudger to respond, “No’m. I aint tellin’ no lies. It de gospel truf. It sho is.”<sup>99</sup> Gudger’s very age and extremely small stature, at a mere five feet, also lends credence to her points.<sup>100</sup> Her nutritional deprivation was so great that she walked two miles barefoot in the snow just for some hot filling food. Chained to a slaveholder that cared only if she survived and not if she starved, Gudger was left stunted in growth.<sup>101</sup> But her height is an outlier when compared to height data of enslaved populations in the colder regions of the slaveholding south from the same time.

Gudger was born into a period which drove migration across the Atlantic and within the U.S. itself. This period of change shifted the conditions of enslavement, bringing forth the circumstances in which enslaved children could see more rest than they had before. As for the Tambora eruption, it initiated a period of cooling that exceeded the period before it. In the year without a summer, snowstorms attacked New England in May. The gloom from Tambora’s atmospheric cloak of ash inspired Mary Shelley’s *Frankenstein* as well as the dreary London in the works of artists from the period.<sup>102</sup> The Year without a Summer has been explored in art and literary history as well as environmental history, but the social and economic changes it and the volcanic eruptions before it effectuated have only just begun to be explored.

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<sup>99</sup> AS:11:1:354.

<sup>100</sup> Ibid, 351.

<sup>101</sup> Ironically, that very stature was a strong factor in her longevity. Studies on growth and longevity suggest that the smaller you are, the more likely you are to live longer. Of course, wealth also plays a key role here—and many of these respondents lived close to urban areas, even during the Great Depression. The WPA respondents who have lived long enough to become respondents are more likely to be smaller. This offers interesting suggestions about the circumstances of their enslavement. Were there more slaveholders who deprived their slaves than those that appeared generous? Were the stories that slaveholders offered about terrible and awful neighbours who abused their slaves with abandon simply stories that allowed them to digest the abuse that they themselves experienced? Did all the respondents, as per the arguments of the historians critical of the WPA interviews, indeed downplay the abuse and brutality?

<sup>102</sup> Wood, *Tambora: The Eruption that Changed the World*, 39-40.

Attempting to trace these changes among the enslaved populations in the U.S. is difficult because much of the former slaves who lived during that time and published narratives were concerned with legitimizing the abolition movement. As the history of this period becomes further explored, we can study the social and economic changes in the U.S. South and trace and speculate on the changes to the conditions in which enslaved people lived. One tangible evidence of this change is an increase in average height among enslaved men, an indicator of slave health that tells us the period just before this phenomenon may have contained an anomalous event that effectuated a shift in behavior. I argue that the climate events of 1809 to 1812, which shortened the growing season in the cold south, allowed slaves, particularly enslaved children, as we will see in the next chapter, to rest longer than slaves could in the warmer period in the late eighteenth century.

In the aftermath of the Tambora eruption in 1816, Wolfgang Behringer noted that contemporaries referenced 1811 as a year of mild weather with abundant harvests. As we have seen, however, “only the retrospective view from 1816/17... made 1811 seem like a golden year.”<sup>103</sup> But even as climate change effected profound changes on the schedule that enslaved individuals worked, for the Virginia increase to have occurred at the time it did require more than an increase in rest. So, just as Tambora’s effects amplified the effects of its predecessor, Mount X, changes to the growing season had the impact it did on slave health because a foundation of nutritional health had already begun in the years before it.

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<sup>103</sup> Behringer, *Tambora and the Year without a Summer*, 21.

### CHAPTER 3      A PINT OF MILK

Before he was freed as a teenager, WPA respondent Bacchus White was enslaved on one of the larger plantations in piedmont Virginia. A distinct feature of the plantation was the dedication to dairy farming. White estimated that his fellow slaves milked “sixty or fifty gallons of milk a day.”<sup>1</sup> Enslaved children saw some of that milk—but Bacchus’ friend, Tom, wanted more. Tom would snatch up a bucket without the slaveholder any the wiser.<sup>2</sup> Contrary to older studies of slave diet, which declared that slaves did not and could not drink milk, cold-south slaveholders rationed milk to enslaved children. The rations began once enslaved children survived their infancy, providing them with a relative brief period of recovery from nutritional deprivation.

But drinking milk for most of the year would do little if these children did not get the necessary recovery. Height plots of the average enslaved child’s growth development show clearly what occurs when this diet and recovery are not in sync.<sup>3</sup> Around age four, enslaved children saw a sharp increase in height, attributable to a sudden increase in rations once they survived infancy (see fig.3 and fig.4). But this increase generally plateaus after the age of five, at which time enslaved children typically began running errands and other tasks around the slaveholding. In the cold south, the extension of winter and the shortening of the growing season initiated a twenty-year period of generational increase in height in 1815.

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<sup>1</sup> Charles L. Perdue Jr., Thomas E. Barden, and Robert K. Phillips, eds. *Weevils in the Wheat: Interviews with Virginia Ex-Slaves*, 2<sup>nd</sup> ed. (Charlottesville: University of Virginia Press, 1994), 306.

<sup>2</sup> *Weevils in the Wheat*, 306.

<sup>3</sup> Robert William Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: W.W. Norton & Company, 1989), 143, figure 25; Eric B. Schneider, “Children’s growth in an adaptive framework: explaining the growth patterns of American slaves and other historical populations,” *Economic History Review* 70, no. 1 (2017): 13, figure 4.

Studies of slave height focus on general averages across the US South with a few statistical considerations for region. Richard Steckel was among the first to examine child slave height as a measure of population health, arguing that enslaved children lagged behind the modern standard of height for their age group until they reached adolescence.<sup>4</sup> Later, using Steckel's data, Robert Fogel compared nineteenth-century height averages in the US South and in the British colony of Trinidad against the modern-day American height standard.<sup>5</sup> According to Fogel, enslaved infants, between the ages of zero and three, were on average well below even the first percentile expected of modern-day American children. Children in this percentile are so malnourished that their height is stunted as their metabolic systems redirect resources towards keeping them alive.<sup>6</sup> However, Steckel's data shows US slave height average diverged from the Trinidad average in adulthood; adult US slaves were close to the percentile of height of the average American. Whatever their infant health status, enslaved men seemed to catch up through childhood and adolescence.

Despite high infant mortality rates across the US, infant nutritional deprivation was likely worse for the average child born into slavery.<sup>7</sup> Most enslaved children experienced a mild catch-up period after the age of 3.5 (see fig. 3).<sup>8</sup> Fogel points to *in utero* malnutrition as the driving factor for the small size of enslaved infants. Enslaved pregnant women were unable to consume

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<sup>4</sup> Richard H. Steckel, "A peculiar population: the nutrition, health, and mortality of American slaves from childhood to maturity," *Journal of Economic History* 46, no. 3 (1986): 724-726. Steckel's work built on the work with slave height he had initiated with Robert Margo in the late 1970s. See Margo and Steckel, "The Heights of American Slaves," 517-522.

<sup>5</sup> Fogel, *Without Consent or Contract*, 142-143.

<sup>6</sup> Richard H. Steckel, "Work, Disease and Diet in the Health and Moratlity of American Slaves," In *Without Consent or Contract: The Rise and Fall of American Slavery*. Vol. 2. *Technical Papers: Conditions of Slave Life and the Transition to Freedom*, edited by R. W. Fogel and S. L. Engerman (New York: W. W. Norton, 1992), 497-507.

<sup>7</sup> Richard H. Steckel, "Slave Mortality: Analysis of Evidence from Plantation Records," *Social Science History* 3, no. 3 (1979): 89-95; Steckel, "Work, Disease and Diet of American Slaves," 495-497. For the child slave mortality on the lowcountry rice plantations in the 1830s, see William Dusinberre, *Them Dark Days: Slavery in the American Rice Swamps* (Oxford: Oxford University Press, 1996), 235-245.

<sup>8</sup> Steckel, "Work, Disease and Diet of American Slaves," 495-497.

the necessary caloric and nutritional amounts to give birth to infants of regular weight. Eric Schneider argues that postnatal, or infant, malnutrition rather than *in utero* was responsible for stunted growth (see fig. 4).<sup>9</sup> Enslaved women were forced to work within a month after childbirth, leaving their children with decreased access to the necessary nutrients to grow at a consistent pace. Enslaved women, female slaveholders, and enslaved children assigned as nurses fed these infants pap, or a form of gruel and a poor substitute for breastmilk.<sup>10</sup> What enslaved children ate in early childhood made up for this initial deprivation, increasing their average height.<sup>11</sup>

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<sup>9</sup> Eric Schneider offers up an alternative explanation for the catch-up period, arguing that in-utero malnutrition permanently altered the development of the metabolism of enslaved infants. Eric B. Schneider, “Children’s growth in an adaptive framework: explaining the growth patterns of American slaves and other historical populations,” *Economic History Review* 70, no. 1 (2017): 17-19.

<sup>10</sup> Enslaved parents and kinfolk attempted to make up for this deprivation. Because the average enslaved mother did not receive an increase in rations or supplement foods, it is highly likely that families resorted to supplement foods for their infant instead. At the time, supplement foods were not adequate replacements for breast milk. These foods were largely mush made from cornmeal and water or even fresh milk taken from the slaveholdings’ cows. However, infant nutritional requirements cannot be met solely with mush. Furthermore, the conditions in which mush was made (typically in a communal pot) may not have been hygienic enough to feed a month-old baby. Stephanie Jones-Rogers, “[S]he could ... spare one ample breast for the profit of her owner’: white mothers and enslaved wet nurses’ invisible labor in American slave markets,” *Slavery & Abolition* 38, no. 2 (2017): 340; Richard H. Steckel, “Stature and the Standard of Living,” *Journal of Economic Literature* 33, no. 4 (1995): 1924.

<sup>11</sup> The average height increases for children in the four- to six-year mark, after which the data typically shows a plateau in the initially increasing growth. See figure 2.

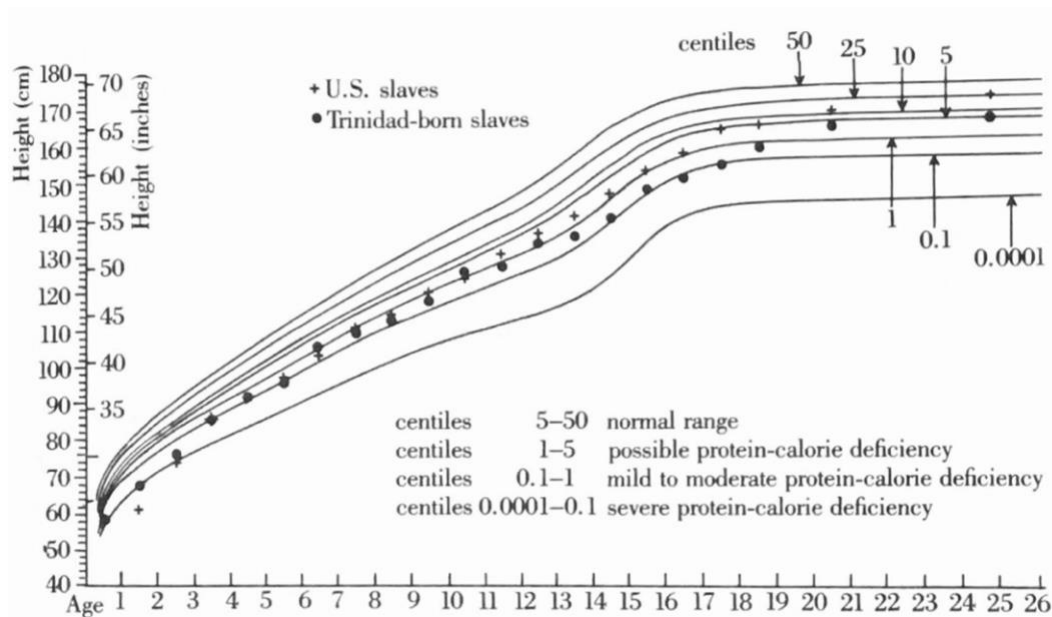


Figure 3 Mean height of male slaves from the U.S. and Trinidad through childhood and adulthood. “The extent to which mean heights of male slaves in the United States and Trinidad deviated from the modern height standard,” from Robert William Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery*, p. 143, Figure 25.

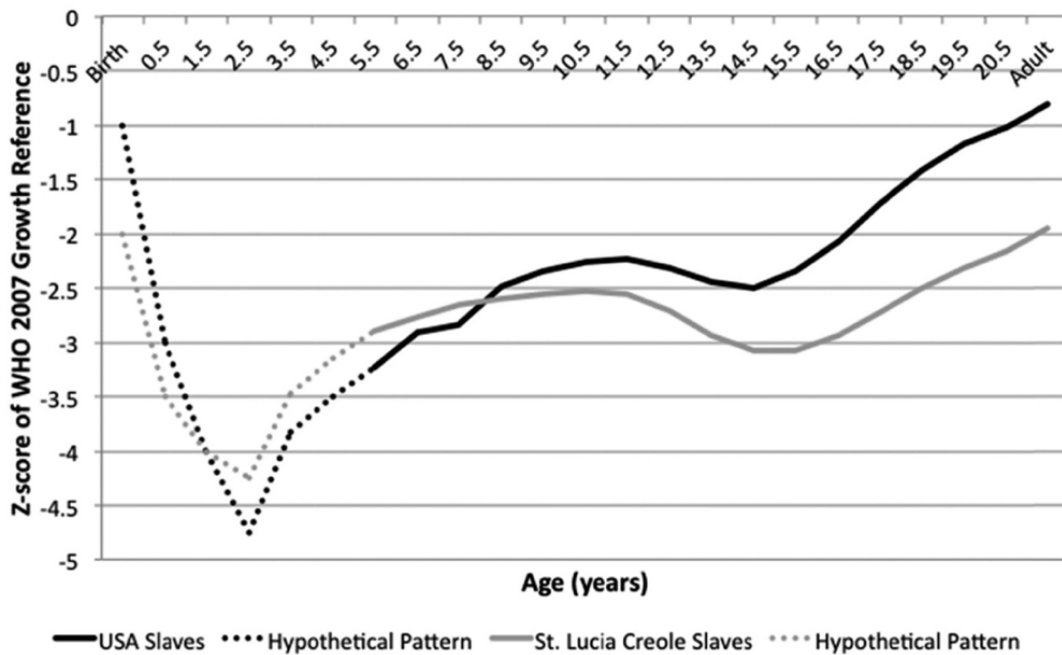


Figure 4 “Hypothetical and observed growth patterns of slave boys in the antebellum US South and the Caribbean,” from Eric Schneider, “Children’s growth in an adaptive framework: explaining the growth patterns of American slaves and other historical populations,” p. 13, Figure 4.



Though the average enslaved African-American man caught up from an initial deprivation, he was slightly shorter than his freeborn peers.<sup>12</sup> Yet, the data computed by Robert Margo and Richard Steckel found that the average height of an enslaved man born between 1790 and 1840 increased decade on decade.<sup>13</sup> Focusing on free-born people in nineteenth-century Virginia, Howard Bodenhorn replicated these results, suggesting that the average height of enslaved men increased between 1815 and 1835.<sup>14</sup> Free-born Black Virginians held a general height advantage over the enslaved Virginian population. However, by the 1830s, the average height of the enslaved Virginian man caught up to the average height of the free-born male population and held constant.<sup>15</sup> This suggests that following deprivation, the nutritional status of enslaved male children remained functionally adequate. So, what explained the Virginia increase?

Regional environmental differences meant that slaves had access to different kinds of foods at different times and to differing degrees. From the beginning of the nineteenth-century to the beginning of the Civil War, the slaveholding states of Virginia, Maryland, and North Carolina were the coldest regions of the US south with the largest percentage of enslaved African-Americans per white Americans.<sup>16</sup> These distinctly seasonal slaveholding states did not

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<sup>12</sup> Margo and Steckel, “The Heights of American Slaves,” 519.

<sup>13</sup> This increase plateaued in 1820 and then continued to increase in the early 1830s. *Ibid.*, 520, table 2.

<sup>14</sup> Howard Bodenhorn, “A Troublesome Caste: Height and Nutrition of Antebellum Virginia’s Rural Free Blacks.” *Journal of Economic History* 59, no. 4 (1999): 983, table 2.

<sup>15</sup> Bodenhorn, “Height and Nutrition of Antebellum Virginia’s Rural Free Blacks,” 983, table 2.

<sup>16</sup> These states also had more climatic and topographical variability—Virginia and Maryland more than North Carolina. This variability allows for comparison of provisions and supplement foods between regions within the state. Though Kentucky, Tennessee, and Ohio were also among the colder slaveholding states, height data, such as runaway newspaper advertisements, was not as easily accessible remotely as data from Virginia, Maryland, and North Carolina.

share the same brutal winters as the more northern states, but they were cold enough that the enslaved people who laboured throughout the year could expect more rest during this time than they could during others.<sup>17</sup> In comparison, those enslaved on warm-south slaveholdings experienced even longer growing periods in which crops were constantly and consistently sown, planted, harvested, and processed.<sup>18</sup> The milder seasons and the proliferation and primacy of monocropping culture meant that rest was scarcer the further into the warm south one was enslaved. During the nineteenth century's cold decade, that period of rest was extended.

Enslaved children in the cold south made up for infant nutritional deprivation because they were forced to labour at an early age. Because they were compelled into the work force, slaveholders increased their rations, which were made up of milk and bread for most of their early childhood. The environmental conditions in the cold south encouraged greater production of milk than in the warm south, which, despite claims of widespread "lactose intolerance" among historical African populations, enslaved children consumed abundantly. Consistent and relatively constant consumption of milk, and not just cornbread and pot liquor, or broth, provided this brief advantage.

The food that WPA respondents from the cold south described consuming the most during childhood was milk. The milk discussed in slave narratives and interviews was not fresh: slaves consumed soured skimmed milk that they called buttermilk.<sup>19</sup> Fugitive slave Charles Ball noted how "some planters...kept the sour milk, after all the cream had been skimmed from it,

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<sup>17</sup> Justin Roberts, *Slavery and the Enlightenment in the British Atlantic, 1780-1807* (New York: Cambridge University Press, 2013), 88.

<sup>18</sup> The rice cycle for instance, began in January and February and ended, in the best cases, the next January, and in the worst, the March the subsequent year. Morgan, *Slave Counterpoint*, 149.

<sup>19</sup> Fresh milk was a highly perishable product. Farmers who owned cows consumed or sold milk in the form of cheese and butter—solid dairy products that were easy to transport and that could be salted to prevent spoilage. If milk was in a fluid form, most drank in a fermented form.

and made a daily distribution.”<sup>20</sup> Fresh milk was usually left out for a day or two to allow the cream and milk to separate. If left out for long enough, the lactose, or milk sugar, in the milk converted to lactic acid, imparting a sour taste after the sweet cream was removed. For some former slaves, this buttermilk may have been the result of butter-making—a tangy whey-based product rather than milk fresh from the cow. However, slave testimony illustrates that most enslaved children in Virginia were consistently consuming soured skimmed milk. This distinction is important because buttermilk from the result of butter-making would have had significantly less calories and less palatability than soured skimmed milk, two factors that would have encouraged rapid recovery following near starvation in infancy. Consumption of both this milk as well as fresh whole milk contributed to the height catch-up enslaved men experienced later in life.

Despite the evidence, the historical record reflects the opinion that the average American slave did not consume much milk, even as a child, in part because of the prevalence of “lactose intolerance” even among children. According to this thesis, most enslaved African Americans allegedly could not produce the lactase enzyme that facilitates the digestion of lactose (a complex sugar present in certain dairy products like fresh milk).<sup>21</sup> Accepting this thesis, despite access to dairy cows, enslaved children would not have been able to consume the necessary calories to catch up from their deprived infancy. And yet, in the cold south, enslaved children caught up to their peers—and the average height among enslaved men increased year upon year.

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<sup>20</sup> Charles Ball, *Slavery in the United States: A narrative of the life and adventures of Charles Ball, a black man, who lived forty years in Maryland, South Carolina and Georgia as a slave* (New York: J.S. Taylor, 1837), 43.

<sup>21</sup> Slaveholders witnessed these symptoms of indigestion and refrained from provisioning milk of any kind to their slaves—if they did, the milk was typically sour. Kiple and King, *Another Dimension to the Black Diaspora*, 84. William George Hinton was the only WPA respondent formerly enslaved in the cold south to describe milk consumption in a negative light. He told a story of a slave, Sallie Temples, who had run away and as a result, her slaveholder “stuck hot irons to her. Made ‘em drink milk an’ things for punishment is what my mother an’ father said.” AS:11:1:443.

The “lactose intolerance” thesis presents its condition as an inheritable, inescapable force that can be traced back from the modern-day to historical populations. These extrapolations emerge from the nutrition studies of their time, citing one study that claimed lactose intolerance among African-Americans in the 1970s was at 70 percent.<sup>22</sup> In terms of historical West Africa, environmental conditions, such as abundant sunshine and the presence of the tsetse fly, created little need for milk consumption. Kenneth Kiple and Virginia King, in their seminal work on slave diet, conclude that this intolerance among the nineteenth-century enslaved American population may have reached 100 percent.<sup>23</sup> However, recent research informs us that lactose intolerance is not as straightforward as an inheritable genetic condition.

This phenomenon of indigestion is better described as “lactase impersistence.” This term shifts the nominal focus of the condition from a genetic inability to digest a food to the presence and absence of an enzyme, lactase, in adulthood.<sup>24</sup> Children and adolescents can lose the lactase enzyme, but this loss is not permanent. The lactase enzyme can be activated the gut through fermented dairy products.<sup>25</sup> Fermentation processes foods, breaking them down to be more digestible. Former slaves tell of how milk left outside for two to three days soured, a process of

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<sup>22</sup> Nicholas Scott Cardell and Mark Myron Hopkins, “The Effect of Milk Intolerance on the Consumption of Milk by Slaves in 1860,” *The Journal of Interdisciplinary History* 8, no. 3 (1978): 510.

<sup>23</sup> Kiple and King, as well as even earlier historians, make use of science articles that claim that lactose intolerance in adults “in coastal Nigeria—especially Yoruba and Ibo—are almost 100 percent lactose intolerant.” They assert the connection to African-Americans by imprecisely claiming that “most of the ancestors of black Americans came from these or similar West African tribes.” Cardell and Hopkins, “The Consumption of Milk by Slaves in 1860,” 509-510; Kiple and King, *Another Dimension to the Black Diaspora*, 84.

<sup>24</sup> Lactose is the sugar present in fresh milk and other dairy products, such as fresh cheeses. It is a complex sugar made up of two simple sugars, glucose and galactose. When lactose is ingested and reaches the gut, the enzyme lactase assists in the division of lactose into its two simpler sugars. The simpler the sugar, the easier it is to digest. The digestion of lactose in its complex form is much more difficult. Those who have lactase persistence can consume fresh milk products into adulthood without symptoms of maldigestion. The symptoms associated with “lactose intolerance” are the result of the absence of lactase in the gut, an absence that can be seen across age groups. Dennis A. Savaiano and Robert W. Hutkins, “Yogurt, cultured fermented milk, and health: a systematic review,” *Nutrition Reviews* 79, no. 5 (2021): 599-614; Andrea S. Wiley, *Re-Imagining Milk: Cultural and Biological Perspectives* (New York: Routledge, 2016), 23.

<sup>25</sup> Steven Hertzler and Shannon M. Clancy, “Kefir improves lactose digestion and tolerance in adults with lactose maldigestion,” *Journal of the American Dietetic Association* 103, no.5 (2003): 582-587.

fermentation.<sup>26</sup> This process thus not only made the milk easier to digest, but it also increased the likelihood that a slave could digest fresh milk by encouraging the inoculation of lactase.<sup>27</sup> Prior to Kiple and King’s publication, studies of slave diet assumed that the milk being consumed in 1860 was fresh.<sup>28</sup> However, when most nineteenth-century Americans—not just enslaved populations—consumed milk, they were consuming soured dairy products.<sup>29</sup> Excluding those who lived on farms, access to fresh milk was the exception, not the rule.

On the plantation—or even on the smaller farm slaveholding—fresh milk was not as anomalous as Kiple and King claim.<sup>30</sup> George Jackson, who was a child during slavery in piedmont Virginia, described his meals as “fat pork, corn bread, black molasses and hed [sic] milk,” or the cream that floated up to the surface of the milk bucket.<sup>31</sup> Slaves who lived on farms with large stocks of milk cows had access to fresh milk, depending on the attitude of the slaveholder and their attitude to the slaveholder. At Mount Vernon, George Washington allowed

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<sup>26</sup> Lucy Brooks in AS:8:3; Sallie Paul AS:14:4:232; Millie Evans AS:2:2:240.

<sup>27</sup> A meta-analysis of nearly thirty years of research on fermented milk has found that milk that is fermented and not pasteurized has a more pronounced effect on improving lactose maldigestion than milk that is fermented and pasteurized (in either order). This suggests that the prevalence of lactose maldigestion may be symptomatic of pasteurization, a heating process that makes prolongs shelf life and eliminates fatal bacteria. Savaino and Hutkins, “Yogurt: a systematic review,” 603-604.

<sup>28</sup> Cardell and Hopkins, “The Effect of Milk Intolerance,” *The Journal of Interdisciplinary History* 8, no. 3 (1978): 510. Yet, they give a perceptive explanation for lactose intolerance: “A person who is lactase-deficient does not have enough lactase to break down lactose at a reasonable rate.” They later succumb to the explanation of genetics for why certain populations indicate more digestive issues with milk than others. Cardell and Hopkins, “The Consumption of Milk by Slaves in 1860,” 507. Kiple and King concluded that the milk being rationed was soured. Kiple and King, *Another Dimension to the Black Diaspora*, 84.

<sup>29</sup> E. Melanie Dupuis, *Nature’s Perfect Food: How Milk Became America’s Drink* (New York: New York University Press, 2002), 28-30; Wiley, *Re-Imagining Milk*, 44-49.

<sup>30</sup> Frank Patterson, enslaved in North Carolina, claimed that his slaveholder would allow a family “that had a whole lot of children” a cow to milk “for to get milk for their children. They claimed the cow, but the master was the owner of it. It belonged to him. He would just let them milk it. He would just let them raise their children off of the milk it gave.” Little other cold south respondents share similar stories of slaveholders providing slave families with whole cows to milk. AS:2:5:277.

<sup>31</sup> AS:12:45.

the adult slaves on his slaveholding to supplement their rations with “whatever milk...they might find themselves.”<sup>32</sup>

Other slaves stole milk without consideration for the thoughts of their slaveholder. In the mid- to late eighteenth century, Landon Carter’s slaves helped themselves to the cows with abandon. Criss, despite being whipped, continued to milk cows for her children.<sup>33</sup> Dolman kept two cows close to feed to his child. When caught, Landon ordered both cows away, decreasing the rations for his child to just one pint.<sup>34</sup> Candis Goodwin recalled going to the plantation dairy and stealing “inything we want an’ [taking] it our houses in de wood.”<sup>35</sup> Bacchus White’s friend, Tom, “uster to git a bucket of milk on de sly” because on that Virginia slaveholding they had “all de pot licker we want, but we did’nt ‘ave no milk.”<sup>36</sup> Even if we accept the thesis that the majority of slaves had lactase impersistence, there existed at least a substantial amount of slaves that wanted milk and acted on these desires.

The myth of historical lactase impersistence has continued in recent histories of slavery. In Herbert Covey and Dwight Eisanach’s 2007 monograph of the antebellum slave diet, they accept Kiple and King’s premise about West African diet: “Culturally drinking milk is uncommon among West African peoples, and they were essentially lactose intolerant.”<sup>37</sup> But even historians delving into the history of milk consumption make broad and incorrect claims

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<sup>32</sup> Allan Kulikoff, *Tobacco and Slaves: The Development of Southern Cultures in the Chesapeake, 1680-1800* (Chapel Hill: University of North Carolina Press, 1986), 392.

<sup>33</sup> Landon Carter, *The Diary of Colonel Landon Carter of Sabine Hall, 1752-1778*, ed. Jack P. Greene, Vol. 1 (Charlottesville, VA.: University Press of Virginia, 1965), 372.

<sup>34</sup> Carter, *The Diary of Colonel Landon Carter*, 517.

<sup>35</sup> AS:17:17.

<sup>36</sup> *Weevils in the Wheat*, 306.

<sup>37</sup> They do question the conclusion of “lactose intolerance” among creolized slaves, or the established descendants of enslaved Africans: “[Ex-slaves] frequently mention milk and how much it was consumed, suggesting that lactose intolerance may have been less widespread than once thought or that, perhaps after generations of life in America, African Americans may have been better adapted to dairy products.” Their focus on slave testimony grants them a broader perspective on the lactose intolerance thesis. However, this conclusion still accepts the thesis that west Africans historically did not consume milk on the basis of geographic determinism. Covey and Eisanach, *What the Slaves Ate*, 18.

about historical milk consumption in West Africa.<sup>38</sup> From the food historians to the slavery historians, the explanation for lactase impersistence lies in the accident of geography.

Kiple and King claim that “[In West Africa] the presence of the tsetse fly made the raising of cattle virtually impossible, effectively discouraging the development of a milk-drinking culture.”<sup>39</sup> Without expanding on their scientific source, Kiple and King homogenize the geography of West Africa, and look to no contemporary sources to justify this conclusion. The tsetse fly transmits a disease lethal to large livestock, preventing large-scale breeding, as seen in certain parts of Europe and America.<sup>40</sup> It is a feature of tropical forests with dense covers, particularly evergreen and deciduous woodland, close to running water, and typically in the Guinean bioclimatic sub-region, which covers sections of the West African coast.<sup>41</sup> New and long-established ports in this region later became major points of purchase for slave traders, such as Elmina and Cape Coast in the Gold Coast and Ouidah along the Bight of Benin.<sup>42</sup> In fifteenth-

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<sup>38</sup> In their focus on its importance in western cultures, historical milk consumption in Africa is reduced to “Saharan nomads [who] drank nothing but milk and blood nine months of the year” because of their harsh living environment. In *Stirring the Pot*, a monograph of African cuisine, James McMann briefly references the “Fulani in West Africa” as part of pastoral groups who were uniquely positioned geographically to care for cattle. In his chapter on West African cuisine, one excerpt makes note of milk drunk among Mande speakers in the early sixteenth-century Mali empire with little elaboration. However, most mentions of African milk drinkers are reserved for the pastoralist Oromo in the Ethiopian highlands and the pastoralist Zulu in the Mediterranean-like South Africa. Countering the idea that there was no historical milk consumption in west Africa, historian Jessica Harris discusses fermented foodways in West Africa, noting the “buttermilk-like *lar* and *tchiakri* of Senegambia.” Dupuis, *Nature’s Perfect Food*, 28; Jessica B. Harris, *High on the Hog: A Culinary Journey from Africa to America* (New York: Bloomsbury, 2012), 55; James C. McMann, *Stirring the Pot: A History of African Cuisine* (Athens, OH.: Ohio University Press, 2008), 17-16, 21, 38, 88-89; Wiley, *Re-Imagining Milk*, 22.

<sup>39</sup> Kiple and King, *Another Dimension to the Black Diaspora*, 84.

<sup>40</sup> Susan Keech McIntosh, and Roderick J. McIntosh, “West African Prehistory: Archaeological studies in recent decades have illuminated the prehistory of this vast region, revealing unexpected complexity in its development from 10,000 B.C. to A.D. 1000,” *American Scientist* 69, no. 6 (1981): 603.

<sup>41</sup> Stephen Bunmi Ogungbenro and Yobi Eniolu Morakinyo, “Rainfall distribution and change detection across climatic zones in Nigeria,” *Weather and Climate Extremes* 5, no. 6 (2014): figure 1, 2; Toby Green, *A Fistful of Shells: West Africa from the Rise of the Slave Trade to the Age of Revolution* (Chicago: University of Chicago Press, 2019), 112-113, 287.

<sup>42</sup> Wet and dry seasons and deciduous forests characterize the Guinean sub-region. Marcella Alsan, “The Effect of the TseTse Fly on African Development,” *The American Economic Review* 105, no. 1 (2015): 388; G. Cecchi, R.C. Mattioli, J. Slingenbergh, and S. De La Rocque, “Land cover and tsetse fly distributions in sub-Saharan African,” *Medical and Veterinary Entomology* 22, no. 4 (2008): 368.

century West Africa, European travellers noted several societies located in different areas of the coast and in the interior that consumed fluid milk. Though the tsetse fly challenged, and continues to challenge, attempts to keep livestock, these affected areas do not make up the entirety of West Africa. Furthermore, on the part of the condition as heritable and immutable, research has found that modern-day west African populations demonstrate that many still share the genetic marker that allows one to consume large quantities of milk even in adulthood.

The lactose intolerance thesis folds West African history into a simplistic geography and relies upon mid-twentieth-century science to explain a genetic phenomenon that is more elastic than fixed, more amenable to environmental conditions than not. Recent data has identified a large area of West Africa where populations share the phenotype that allows for lactase persistence into adulthood.<sup>43</sup> This data tells us that even in modern-day west Africa, when considering the tsetse fly, lactase impersistence is not absolute. If lactase impersistence is not so prevalent even today in West Africa, then the theory from which Kiple and King extrapolated about 100 per cent “lactose intolerance” on the antebellum American plantation should be discarded.

Accepting the premise that West African societies were not subject to the disease-ridden tsetse fly also requires a revision of how an older set of slavery scholars drew their assumptions about the enslaved West Africans coming into American ports. As they drew evidence of port origin from journals, tax records, and ship manifests, there emerged an assumption that the ports from which the slave ships sailed, in some ways, corresponded with the ethnicity or culture of

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<sup>43</sup> That is, the inland population from midway down the Niger River up north to Morocco can consume fresh milk. In much of the forest and savanna region, stretching from Sierra Leone to the border of Cameroon, many individuals do not the lactase persistence phenotype.



the captives sold to those ships.<sup>44</sup> What may provide better context to subsistence patterns among the multiple societies, kingdoms, and empires in West Africa from which people were taken captive may be a look at sources that date to the dawn of the Atlantic slave trade with the Portuguese and to even earlier sources. These earlier sources captured views of the West African societies living in the interior in comparison to sources of the slave trade era, which focus on coastal West Africa.

Travel journals and archaeological evidence demonstrate that more inland West African societies and ancient civilizations did in fact consume dairy, and even fluid milk. The Portuguese invested in tentative journeys to the African west coast during the mid- to late fifteenth century, at the juncture of a transition in power between the Mali Empire and the emergent Songhai Empire.<sup>45</sup> One of these explorers, the Venetian Luiz de Cadamosto, made the journey along the Gambia River in 1455. He noted of the people at the mouth of the river that “their sustenance is entirely millet and vegetables, flesh and milk.”<sup>46</sup> This milk may be what Senegambians today call *lar*, a fermented fluid product similar to buttermilk.<sup>47</sup> Cadamosto also found evidence of large livestock. When Cadamosto travelled further south, near the Guinea climatic zone along the West African coast, a region where the tsetse fly abounds today, the coastal people there “have the flesh of cows and goats.”<sup>48</sup> Large livestock was “not in [the] large quantities” that he was used to in his travels across Europe, but the Portuguese continued to purchase livestock for their travels as they continued to trade along the Guinea coast, suggesting that these cattle-

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<sup>44</sup> John K. Thornton, *Africa and Africans in the Making of the Atlantic World, 1400-1800*, second ed. (New York: Cambridge University Press, 1998), 95-96.

<sup>45</sup> Green, *A Fistful of Shells*, 37.

<sup>46</sup> G.R. Crone, trans., eds., *The Voyages of Cadamosto and other Documents on Western Africa in the Second Half of the Fifteenth Century* (Nendeln, Liechtenstein: Kraus Reprint Limited, 1967), 62.

<sup>47</sup> Harris, *High on the Hog*, 55.

<sup>48</sup> Crone, *The Voyages of Cadamosto*, 80.

herding societies had circumvented their environmental circumstances.<sup>49</sup> Other European travellers through the fifteenth to the seventeenth century also noted an abundance of milk and cattle.<sup>50</sup> As later travellers were forced to remain and concentrate their settlements on the coast, they missed similar observations of societies above the coastal region, who undoubtedly continued these foodways, even without the observing European eye.

Although it is not clear whether these peoples were drinking fresh or fermented milk, these observations tell us that these peoples were consuming some kind of fluid dairy product regularly—contrary to the assumption that dairy was not consumed in precolonial West Africa. In fact, dairy was likely a significant staple in the inland regions far before the transatlantic slave trade. Archaeological analysis of fragments found at the site of an Iron-Age city, Jenne-Jeno, in modern-day Mali, suggests that fluid milk had been part of the diet of its inhabitants within a period that spans 100 to 1200 C.E.<sup>51</sup> One final factor that dispels the idea of lactase impersistence as a historical hallmark of West Africa is a breed of cattle specific to the coastal region, the *n'dama*. This breed is resistant to the tsetse's sleeping sickness, allowing herders to travel between regions without fear of its disease. A recent measure of milk production in the *n'dama* has demonstrated that the breed outproduces the other African breed prevalent today, the *Zoa*.<sup>52</sup> It seems that when these African societies chose to breed cattle, they did not sacrifice milk

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<sup>49</sup> Judith A. Carney and Richard Nicholas Rosomoff, *In the Shadow of Slavery: Africa's Botanical Legacy in the Atlantic World* (Berkeley: University of California Press, 2010), 155-157.

<sup>50</sup> In 1447, Antoine Malfante noted near the kingdom near the Niger River Basin had an “abundance of flesh, milk, and rice.” In the seventeenth century, traders commented on nearby societies having “plenty of milk, and excellent fat (*manteiga*, ‘butter’)” and being granted “more cattle and sheep than we could use all the time we remained there.” “The Letter of Antoine Malfante” in Crone, *The Voyages of Cadamosto*, 88; Lemos Coelho quoted in Carney and Rosomoff, *In the Shadow of Slavery*, 7; Edward Michelburne quoted in Carney and Rosomoff, *In the Shadow of Slavery*, 156.

<sup>51</sup> Robert L. Hall, “Food Crops and the Slave Trade,” in *African American Foodways: Explorations of History & Culture*, edited by Anne L. Bower (Urbana, IL.: University of Illinois, 2009), 23.

<sup>52</sup> K. Agyemang, R.H. Dwinger, A.S. Grieve, and M.L. Bah, “Milk Production Characteristics and Productivity of N'Dama Cattle Kept Under Village Management in The Gambia,” *Journal of Dairy Science* 74, no. 5 (1991): 1599-1608. [https://doi.org/10.3168/jds.S0022-0302\(91\)78322-7](https://doi.org/10.3168/jds.S0022-0302(91)78322-7)

production for disease resistance. Thus, when mapping frequencies of lactase persistence, it should not come as a surprise that the West African coast shares a similar frequency to the highlands of East Africa, which is the area more popularly associated with African cattle-herding.<sup>53</sup>

West Africans from societies to the east and close to the north of the region had access to milk-producing cows, which would have encouraged the persistence of lactase digestion, even without the use of fermented products. A similar suggestion can be made for enslaved Africans. For African-American slaves, access to milk depended on the location of their slaveholding. The environment of the cold south encouraged milk production to the extent that enslaved children there were able to consume consistent amounts, enough to have supported rapid recovery from their earlier deprivation. However, in addition to the claim that enslaved children had lactose intolerance, Kiple and King conclude that enslaved children could not have had access to milk because the dairy cow breeds used in the US South did not produce adequate amounts to sustain their populations.<sup>54</sup>

Historian Sam Hilliard first presented the argument that cows in the US South did not produce enough milk for slaves to be provided with consistent milk rations.<sup>55</sup> Nineteenth-century census records demonstrate that in terms of how much butter a single milk cow could produce—thus, the quantity of fat in the milk—the southern states lagged behind the eastern and western states.<sup>56</sup> Only Virginia, Tennessee, and Kentucky came close to the butter-to-milk cow ratio of

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<sup>53</sup> McMann, *Stirring the Pot*, 88-89.

<sup>54</sup> Kiple and King, *Another Dimension to the Black Diaspora*, 82-83.

<sup>55</sup> See Appendix 1. Hilliard incorporates regionalism into all parts of his monograph. The other part of his argument with the low milk production in southern cows, and the absence, in contrast to the north, of a robust dairy and beef industry in the nineteenth century is because the south lacked improved lands for pasture. Cattle had to rely on grazing in woods with fodder that did little to fatten them up or boost their milk production. Sam Bowers Hilliard. *Hog Meat and Hoecake: Food Supply in the Old South, 1840-1860* (Athens, GA.: University of Georgia Press, 1972), 134-139.

<sup>56</sup> See Appendix 1.

the northern states. These three states make up what Hilliard called the Hill South, or the states which the Appalachian Mountain range calls home. Though dairy production was highest in the mountain region, to the west of Virginia and North Carolina, the piedmont and tidewater regions within these states as well as Maryland were still prolific producers of milk.<sup>57</sup> The butter-to-milk ratio was important because it demonstrated the quality of southern breeds. Butter was a valued southern staple. The more cream the milk had, the more butter one could produce. It mattered to farmers and slaveholders the quantity and quality of milk cows could produce.

Environmental aspects such as type of forage, and human technology aspects such as the need for manure to fertilize crops, contribute to the likelihood of success in dairy production for farms. According to Hilliard, the inferiority of southern dairy production lies in the inferiority of foraging grasses available in the south and that this also impacted the ratio of cream in cow's milk.<sup>58</sup> If a farm was able to grow diverse crops, they did not have to rely on foraging alone. Diversified farms, like the mixed-crop farms in the cold south, were able to supplement their cattle's winter foraging with winter feed, such as legumes or what was left on the fields after harvest.<sup>59</sup> Hilliard notes that commercial cattle operations performed best in mountain and piedmont country—where mixed-crop agriculture dominates—but it seems that latitude provides a boundary for this performance. Large-scale cattle herding was a northern practice, “most

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<sup>57</sup> Frederick Lee Olmstead, travelling in the 1850s, visited a Maryland slaveholding farm near Washington, D.C. whose only objective in dairy production was “to obtain milk only...sent immediately to town, and for this the Shorthorns are found to be the most profitable breed.” Frederick Lee Olmstead, *Journey to the Seaboard Slave States with Remarks on Their Economy* (New York: Dix & Edards, 1856), 6-7.

<sup>58</sup> Hilliard, *Hog meat and Hoecake*, 134-139; John Majewski, and Viken Tchakerian, “The Environmental Origins of Shifting Cultivation: Climate, Soils, and Disease in the Nineteenth-Century US South,” *Agricultural History* 81, no. 4 (2007): 526-530.

<sup>59</sup> Hilliard, *Hog meat and Hoecake*, 125-126. In the deep south, most slaveholdings focused on a single cash crop, which were grown alongside subsistence crops. By the beginning of the nineteenth century, the unreliable tobacco and wheat market made focusing on a single cash crop an unviable venture for cold south farms. Outside of the Southside region of Virginia and North Carolina, most antebellum cold south slaveholdings grew a mix of cash crops rather than focusing on one alone: tobacco, wheat, and corn. King, *Stolen Childhood*, 93; Kulikoff, *Tobacco and Slaves*, 120; Morgan, *Slave Counterpoint*, 170-171.

common in the ridge and valley region of East Tennessee or on the high meadows and “balds” of North Carolina. Their distribution in northern Alabama and Georgia must have been spotty.”<sup>60</sup> The absence of rich grasses, Hilliard concludes, even in the southern piedmont region, may be to blame. The cooler temperatures of Tennessee and North Carolina ensure environmental similarities between these cold states and those of Virginia and Maryland as well as ones further north.

These unique environmental characteristics permitted dairying farms and plantations in the cold south to generate substantial quantities of milk, enough that they could compete with northern commercial butter production. In comparison to the more southern states, such as Georgia and Alabama, cows in the cold south states of Virginia, Maryland, and North Carolina, as well as the Appalachian states, had access to supplementary feed as well as better foraging grasses, encouraging both quantity and quality of milk output in the warm and cold months, thereby allowing butter and cheese production in these states to reach surplus levels. The milk surplus achieved through forced labour and environmental circumstance encouraged slaveholders to provide enslaved children with milk rations at least twice per day—and, as per Pollard’s account, when children wanted more, they took it.

Slaves on plantations had access to the largest quantities of fresh milk, because the mixed-crop agriculture in the cold south encouraged the use of cattle.<sup>61</sup> William Branch was enslaved on a tobacco and cotton plantation along the coastal fall line in Virginia where there

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<sup>60</sup> Hilliard, *Hog meat and Hoecake*, 127.

<sup>61</sup> Hilliard, *Hog meat and Hoecake*, 124-126; Kulikoff, *Tobacco and Slaves*, 49. Slaveholders also included milk in the rations of adults as well, but they prioritized enslaved children over adults. Charles Ball noted that in Maryland, some planters distributed buttermilk to working slaves, an unique example of prioritizing adults rather than children. James Curry, enslaved on a mixed-crop agriculture farm in piedmont North Carolina, told of how his mother prepared breakfast for the slaves “which consisted of warm corn bread and buttermilk.” On smaller slaveholdings, even adult slaves were allowed dairy. Kiple and King, *Another Dimension to the Black Diaspora*, 83; Ball, *Slavery in the United States*, 42-43; John W. Blassingame, ed. *Slave Testimony: Two Centuries of Letters, Speeches, Interviews, and Autobiographies* (Baton Rouge: Louisiana State University Press, 1977), 133.

“always was lots of fresh milk.”<sup>62</sup> Levi Pollard, enslaved in the piedmont, claimed because his slaveholder “had 180 cows, so us had all de milk us could drink.”<sup>63</sup> Bacchus White was enslaved on a large plantation in piedmont Virginia and described how “dey uster to milk sixty or fifty gallons of milk a day.”<sup>64</sup>

Slaves had more access to fresh milk in the spring and summer months, when cows generally give birth and begin to produce milk, but milk was also included in winter rations for children. By the nineteenth century, New England farmers knew how to prolong the lactation of their cows even into their harsh winters. In 1763, one farmer wrote in her diary that she “Laid in 77 lbs. of butter for the winter in November.”<sup>65</sup> For farmers to achieve a milk surplus through the colder months, cows require a significant caloric surplus. Daniel Robinson, writing in a Maine farmer’s almanac in 1833, had used an “ample crop of turnips, carrots, cabbages or potatoes” to bulk his cows’ diet.<sup>66</sup> He advised leaving two months to allow the cows to recover before calving in the spring. A few decades later, in 1850, the national milking season averaged around 237 days, or roughly seven to eight months, leaving a four- to five-month period where cows were not milked.<sup>67</sup> This estimate includes the warm south region, where, for instance, farms that did have cows never reached the intense and prolonged milk production because poor pastures made for less milk, in quantity and quality.

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<sup>62</sup> AS:16:1:143.

<sup>63</sup> Perdue, Barden, and Phillips, *Weevils in the Wheat*, 227.

<sup>64</sup> The quantity did not mean that access was as simple as it was on Pollard’s former slaveholding. Bacchus recalled that “Tom, one of the boys, uster to git a bucket of milk on de sly, an’ one day Marse saw him an’ Tom sed “Licker Marse, licker Marse.” We uster to ‘ave all de pot licker we want, but we did’nt ‘ave no milk.” Ibid, 306.

<sup>65</sup> Sarah F. McMahan, ““All Things in Their Proper Season”: Seasonal Rhythms of Diet in Nineteenth Century New England,” *Agricultural History* 63, no. 2 (1989): 148fn52.

<sup>66</sup> McMahan, “Seasonal Rhythm of Diet,” 148fn52; Hilliard confirms the use of root vegetables in supplementing feed. Hilliard, *Hog meat and hoecake*, 139.

<sup>67</sup> Fred Bateman, “Labor Inputs and Productivity in American Dairy Agriculture, 1850-1910,” *The Journal of Economic History* 29, no. 2 (1969): 214.

Just further north, however, there is evidence that cold-south slaveholders attached greater importance to their milk cows. In the 1850s, journalist Frederick Law Olmstead observed a Maryland slaveholder who used turnips to bolster milking through the winter. Should his own crop not be enough, the slaveholder secured “a supply of turnips that will allow him to give at least one bushel a day to every cow while in winter quarters.”<sup>68</sup> Farmers in the cold south had the advantage of a longer growing season, as well as slave labour, which made it easier to grow and divert a crop surplus to livestock. As Chapter 2 explored, during the cold decade, which shortened this growing season, the longer winters meant that farmers needed more vegetable stock to feed their cattle.

Like Olmstead observed, cold-south livestock consumed feed that ensured milk production through the winter. Enslaved on a piedmont plantation, George Caulton recalled cooking meals for cattle as a child: “He would gather turnips and other vegetables which he would boil in a huge pot for several hours. When thoroughly cooked he would feed it to a herd of forty head of cattle.”<sup>69</sup> Turnips were used to fatten hogs as well as cows: in tidewater North Carolina, Simuel Riddick recalled feeding both corn and turnips to hogs.<sup>70</sup> Slaves used corn as a supplement the winter feed of livestock in the same way Robinson advised the use of other vegetables.<sup>71</sup> The forced labour available to perform these chores also encouraged the importance slaveholders attached to caring for cows through the winter. Caulton was a child when he began his position as livestock carer—an example of how slaveholders put enslaved children to work, using their labour to realize the very rations that sustained their productivity.

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<sup>68</sup> “The turnips are sliced, slightly salted, and commonly mixed with fodder and meal. Mr. C. finds that salting the sliced turnip twelve hours before it is fed, effectually prevents its communicating any taste to the milk.” Olmstead, *Journey in the Seaboard Slave States*, 8-9.

<sup>69</sup> AS:SS1:3:1:169.

<sup>70</sup> AS:12:2:208.

<sup>71</sup> Walsh, “Slave Life, Slave Society, and Tobacco Production,” 184.

The particularities of cold south slaveholdings allowed these slaveholders to milk their cows at greater quantities and at greater length than more southerly slaveholders. With larger quantities of milk at their disposal, cold south slaveholders redirected far more milk, fresh and otherwise, to their slaves. Testimony from WPA respondents, formerly enslaved in the cold south from the 1820s through to the end of the Civil War, tells us that as children they received the bulk of this surplus milk, consuming it as rationed meals at least twice per day. These quantities, along with the diverse and seasonal crop culture of slaveholders in the region, contributed to the steady catch-up period of enslaved children following deprivation and, ultimately, to their height in adulthood.

Milk was the crucial difference between the regular diet enslaved children consumed in the cold south and the diet children enslaved in the warm south consumed. The diet most enslaved children ate was largely corn.<sup>72</sup> Bioarchaeological evidence from the Eaton's Ferry cemetery in Warren County, North Carolina, suggests that enslaved children in the piedmont region of the cold south were fed high amounts of corn such as corn gruel, or hominy. A few of the burial sites held skeletons identified as being within the zero to six-year-old and five to ten-year-old age range.<sup>73</sup> It is unlikely that slaveholders were adding a protein-heavy food source, such as milk or meat broth, in their corn gruel. However, the analysis of protein content in the diet of these individuals indicates that one of the children, approximately six or seven years old, was second only to the young adult in animal protein consumption. Dent suggests that because of markers that indicate corn consumption, the animals consumed were likely pork or chicken, two animals known to be fed corn.<sup>74</sup> However, this suggestion arises from the assumption that all

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<sup>72</sup> Kiple and King, *Another Dimension to the Black Diaspora*, 97.

<sup>73</sup> Dent, "Interindividual differences in embodied marginalization," 10.

<sup>74</sup> *Ibid.*, 9.



slaves ate primarily chicken and pork, without factoring the difference in age and, consequently, a difference in diet.

Cornbread was the mainstay of the slave diet. But in the cold south, for enslaved children, at least, milk was at times used to replace cornbread.<sup>75</sup> Other slaveholding regions also provided meals of cornbread soaked in milk. The cold south differed in terms of frequency. Environmental circumstances meant that cold south slaveholders could feed their slaves milk close to year-round, much more frequently than their more southern neighbours. When milk was not in surplus, in meals for children, slave cooks across the American south substituted milk with pot liquor.<sup>76</sup> The result was a meal that WPA respondents from Virginia referenced as “mush.”<sup>77</sup>

Variations on mush, with different liquids added to a corn base, occurred throughout the U.S. South, but the Virginian variation was always milk and bread. To make mush, the cook baked a form of cornbread, cooled the bread, tore it to pieces—and in some instances, caramelized these pieces on a skillet, making it even more palatable—and then allowed it to soak in either milk or pot liquor.<sup>78</sup> Former slave Charlotte Willis related a song that distinguished the regional iterations of cornbread: “Old Virginia n—— say he love hot mush;/Alabama n—— say,

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<sup>75</sup> Note the following individuals formerly enslaved in the cold south who reported having meals of milk and bread. See Eli Smith in AS:SS1:1:367; Harry Bridges, AS:SS1:6:1:208; Henry Daniels, AS:SS1:6:1:549. Charlie Davenport, AS:SS1:6:1:570; Charity Jones, AS:SS1:8:3:1194-95; Adaline Montgomery, AS:SS1:9:4:1514; Wright Stapleton, AS:SS1:10:5:2021; Harriet Walker, AS:SS1:10:5:2158; Lizzie Williams, AS:SS1:10:5:2335; Tom Wilson, AS:SS1:10:5:2377.

<sup>76</sup> Amy Alexander in AS:2:1:24-25; Anne Maddox in AS:1:227; Sam and Louisa Everett in AS:3:129; Bacchus White in *Weevils in the Wheat*, 306.

<sup>77</sup> *Weevils in the Wheat*, 228, 306. Just as the ingredients for cornbread differ across regions, so too are there multiple iterations of this meal. Of the two most common iterations, one includes milk and the other pot liquor, or the leftover liquid from a vegetable or meat bone broth. Anne Yentsch, “Excavating the South’s African American Food History,” in *African American Foodways: Explorations of History & Culture*, edited by Anne L. Bower (Urbana, IL.: University of Illinois, 2009), 66.

<sup>78</sup> Bacchus White described the process of making mush: “You take boiling water and pour ‘hit o’er corn meal den let it git real cold an’ cut ‘hit ert in pieces, den cook it real brown on a griddle. Den aunt Fanny would put it in a large wooden tray an’ po’r milk o’er hit an’ all de chil’en wo’ld git aro’nd and eat ‘hit wid spoons which dey made ert of muscle shells. Dey wo’ld git these and make spoons ert of dem.” *Ibid*, 307.

good God, n——, hush.”<sup>79</sup> In piedmont Virginia, WPA respondent Levi Pollard noted without much detail that “us eat mush en things like dat fo breakfast.”<sup>80</sup>

The description of a meal comprising of milk and cornbread reoccurs throughout the WPA interviews. Respondents enslaved in the piedmont regions, particularly in Virginia, reported the consumption of the milk iteration more frequently than the pot liquor iteration.<sup>81</sup> Anne Maddox, an elderly respondent that was sold from Virginia to Alabama, described how enslaved children were fed even earlier: “[The] cook had put milk in a long wooden trough an’ crumbled ash-cake in it. Us had pot licker in de trough, too. Us et de bread an’ milk wid shells an’ would use our hands, but it was good.”<sup>82</sup>

As the internal slave trade expanded into the early nineteenth-century, slaves brought this Virginian tradition down south with them.<sup>83</sup> WPA respondent Tom Morris’ mother, Mary, had been the cook on the Mississippi slaveholding. She would serve him “milk an’ bread in er pan an’ sot me down on the kitchen steps an’ tell me to eat.”<sup>84</sup> Mary and Morris were sold when he was just six years old from their Virginian slaveholder down to Mississippi. In the warm south, she continued her position as the cook and brought with her the foodways with which she had grown up.<sup>85</sup> Thus, in pockets of the more southern areas of the slaveholding U.S., milk and

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<sup>79</sup> AS:2:7:198.

<sup>80</sup> *Weevils in the Wheat*, 228.

<sup>81</sup> From Mary Wood: slaveholders in her neighbourhood “would pour buttermilk in dis trough and crumble bread—cornbread ‘course—in dis ole sour milk ‘cause sometimes hit was 2 or 3 days ole. What did dey keer? Oyster shells were used to git up wid like you use spoons.” Ibid, 332.

<sup>82</sup> AS:5:281.

<sup>83</sup> As an example of the eighteenth-century slave trade from Virginia and Maryland to the more western states of Tennessee and Kentucky, Wilma Dunaway illustrates that “three-quarters of Appalachian slave children were fed a corn bread-buttermilk mush”—although she suggests this meal, lacking in protein, is in part responsible for malnutrition. Wilma Dunaway, *The African-American Family in Slavery and Emancipation* (Cambridge: Cambridge University Press, 2003), 145-147.

<sup>84</sup> AS:SS1:9:4:1582.

<sup>85</sup> Former slaves without clear ties to the cold south also recalled meals of milk and bread. Sallie Crane described her meals as “mush and milk.” On one Georgia slaveholding, Henry Kirk Miller related that “the children were fed mostly on milk and mush or milk and bread. We used to bake a corn cake in the ashes, ash cake, and put it in the

cornbread prevailed.<sup>86</sup> But, ultimately, the decisions of cold-south slaveholders could not be replicated in environments without the characteristics necessary to encourage a milk surplus.

In the cold south where cows were more prolific in their milk production, during the summer, spring, and fall, slaveholders provided their slaves with fresh milk in addition to buttermilk. As a result, mush was served more than just once a day during a fixed season.<sup>87</sup> But differences in milk access and availability even within the cold-south states. Individuals enslaved on piedmont slaveholdings that practiced mixed agriculture consumed more milk than those on slaveholdings that focused on a single crop. The piedmont regions of Georgia and Alabama were environments conducive to the establishment of mixed-crop agriculture farms, albeit with less pronounced seasons. WPA respondents who were enslaved in these regions recalled consuming meals of milk and bread more than once a day.<sup>88</sup>

But even outside of this geographic framework, such as the newly settled areas of Texas, mixed agriculture farms were more likely to provide milk regularly to slaves. Amelia Barnett's

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milk." In Alabama, Callie Williams' mother "would feed de youngest on pot-licker and de older ones on greens and pot-licker. Dey had skimmed milk and mush, too, and all of 'em stayed as fast as a butter balls, me among 'em." Williams' mother, an enslaved women who laboured on the field and worked as a nurse for the children, ensured that Williams' always "got [her] share." AS:2:1:54; AS:2:5:88; AS:SS1:1:426.

<sup>86</sup> Though "mush" travelled with slaveholders and slaves from the colder states down south, combination of milk and cereal for infant feeding exists across cultures. See pap and panada, two porridge-like substances made by colonial and republican American parents and nurses to feed their infants. Virginian mush echoes both recipes, substituting the cereal component with cornbread and largely using milk as the liquid component. This echo suggests that slaveholders who provisioned milk and bread to children were not doing so necessarily out of profit. The meal reflects their interest in children who survived infancy in an age of high child mortality rates, an interest complicated by how enslaved children became more viable for forced labour and a high price the older they became and the healthier they remained. Golden, *A Social History of Wet Nursing*, 17; Valerie Fildes, *Breasts, Bottles & Babies: A History of Infant Feeding* (Edinburgh: Edinburgh University Press, 1986), 213-15, 235-236; Deborah M. Valenze, *Milk: A Local and Global History* (New Haven: Yale University Press, 2011), 153-154.

<sup>87</sup> The plantation nurse called Sam and Louisa Everett to the proverbial dinner table "twice a day. Levi Pollard had "mush en things like dat fo breakfast...always nearly have bowl dinner, er fried dinner er soup...Fur supper most times molasses en bread (corn), er hind en milk, or suppers suppin like dat." AS:3:129; *Weevils in the Wheat*, 228.

<sup>88</sup> Squire Irvin's slaveholding was in the mountain region of the cold south, near Nashville, Tennessee. He could not remember "what the grown folks had to eat, but us children had a big skilet [sic] of [m]ush cooked over an open fire. When it was cool, milk was poured over it, and we were each given a spoon and allowed to eat all we wanted out of the skilet. We ate this at night and in the mornings." In Georgia, Cora Shepherd recalled a similar meal schedule where every morning "us had to go to de kitchen and dey give us milk, meat and bread...Den at 4 o'clock every afternoon us had milk, and us got night bread." AS:SS1:8:3:1079; AS:SS1:4:2:552-553.

slaveholding grew cotton, corn, wheat, and peanuts. She recalled that the slaveholder had “about forty-five cows on his plantation. De reason I remembah dat is ‘cause when we was kids we took our tin cups and our bread and went to de cowpen to git our milk.”<sup>89</sup> Still, poor pasture likely made the cows in Texas much less productive. Milk did not flow as freely as it did on more northern farms. Barnett was only allowed to ask “fo’ jes’ one cup ob milk. Dat had to do us till de next mawnin’.” This decision of Barnett’s slaveholder demonstrates what likely occurred in most slaveholdings outside of the cold south. Her slaveholder likely understood the value of providing food to their slaves. But as soon as economic and environmental circumstances made milk precious, its access was immediately restricted.

Thus, outside of the cold south, the “mush” meal was seasonal. Slaveholder access to milk did not mean the same access for the enslaved. On farms and plantations in the newer southern states, milk was a seasonal food and one that, even during its season, was strictly distributed, either for breakfast or supper.<sup>90</sup> As an enslaved child in Georgia, Tillman Bradshaw was served milk only for breakfast. His meals “consisted of bread, milk, and molasses for breakfast; greens, dumplings and meat skins for dinner; and bread and molasses for supper.” The mainstay with which cornbread was mixed was pot liquor.<sup>91</sup> For Sylvia Floyd, who was enslaved in Mississippi, the pot liquor variation of mush was what came to mind when she thought back to her childhood meals. In the winter, she and the other children was given “pot liquor in a big pan wid corn bread crumbled up in it. We would ‘round dat pan ob pot liquor an’ all eat out ob it at

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<sup>89</sup> AS:SS2:2:1:182-183.

<sup>90</sup> As an enslaved child in Georgia, Tillman Bradshaw was served milk only for breakfast. Some slaveholders seemed to consider nutrition when it came to scheduling this timing. Amelia Barnett reported how her slaveholder “always told us dat I wasn’t good fo’ chillun to eat meat fo’ supper,” thus, “milk and bread was all dat de chillun had to eat fo’ supper.” Barnett “to dis day...kain’t eat no meat fo’ supper.” This reasoning may have influenced Adam Singleton’s former slaveholder to likewise serve milk and bread for supper. AS:SS1:3:1:91; AS:SS2:2:1:182; AS:SS1:10:5:1949.

<sup>91</sup> AS:SS1:9:4:1747.

de same time.”<sup>92</sup> In contrast, some cold-south slaveholders were so flush with milk that they could afford to serve enslaved children milk without the bulk of cornbread. Millie Evans remembered how they gathered around a trough filled with buttermilk and drank “wid our mouths an hol’ our johnny cake wid our han’s. I can jus’ see myself drinkin’ now. Hit was so good.”<sup>93</sup> Other respondents reported meals being fed a trough full of milk as children.<sup>94</sup>

Cold-south slaveholders permitted such a liberal allowance of buttermilk because environmental circumstances, and slave labour, encouraged an equally liberal production of milk. Surplus was not the sole economic motivation for this distribution. Slaveholders rationed this valuable product in ways that would benefit them first and foremost. Once enslaved children survived infancy, they could be put to work around the slaveholding. On tobacco farms in the cold south, children as young as five spent hours a day squatting beside and carefully picking destructive worms off tobacco plants.<sup>95</sup> De-worming these plants was most important just before and as tobacco plants ripened. Thus, enslaved children could expect to do the most arduous work through the late summer, from August to September, but they could also expect enough milk and cornbread to somewhat fuel the strenuous work.

Slaveholders provided these rations because over the course of the nineteenth century, they increasingly valued enslaved children. Two federal measures in the 1800s drove this

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<sup>92</sup> Floyd then added, “We eat milk an’ corn bread lak dat too.” The addition may reflect subsequent editing by the interviewer. Floyd may have also experienced instances where the slave cook had served milk and cornbread but that these instances were not as memorable or as frequent as instances where Floyd was given pot liquor and cornbread. AS:SS1:7:2:743.

<sup>93</sup> AS:2:2:240-241.

<sup>94</sup> In tidewater Virginia, enslaved children drank only liquids: “the slave women had no time for their children. These were cared for by an old woman who called them twice a day and fed them “pot likker” (vegetable broth) and skimmed milk.” AS:3:129. For Nannie Williams’ testimony, see *Weevils in the Wheat*, 323. For Fannie Dorum, AS:2:2:182. For George Fleming, AS:SS1:11:130. See also George Anderson in Blassingame, *Slave Testimony*, 568.

<sup>95</sup> John Thompson, “Life of John Thompson, A Fugitive Slave,” in *From Bondage to Belonging: The Worcester Slave Narratives*, eds. B. Eugene McCarthy and Thomas L. Doughton (Amherst, MA.: University of Massachusetts Press, 2007), 45.

increase in valuation. In 1803, President Thomas Jefferson purchased the Territory of Louisiana from the French, granting lease to established and aspirational settler-slaveholders who were pushing into the region.<sup>96</sup> These lands, many of which lay along the Black Belt, a fertile region that cuts across much of the warm south, were especially conducive to growing cotton. The demand for slaves increased. Warm-south slaveholders did not shy away from purchasing enslaved children, but enslaved children sold for more of a premium in Virginia than in New Orleans. In the early nineteenth century, enslaved children under 10 years were often sold by the pound.<sup>97</sup> Because cold-south enslaved children were yet to be subjected to a gruelling cross-state journey or sea voyage, and because environmental circumstances imparted more calorie-dense food selection, enslaved children sold in Virginia were heavier and could fetch higher prices.

Further increasing the price of enslaved children was the ban on the foreign slave trade. In 1807, the U.S. passed an act banning the importation of African slaves.<sup>98</sup> In the cold south, the domestic slave market was already underway when this act passed. Though the act fuelled the growth of the domestic market, it was also passed amid a demographic shift amid the enslaved population in the cold south. African-Americans, that is to say, people who had been born and raised in the U.S., comprised most of the enslaved population in this region by the 1800s, and even by the Revolutionary War.<sup>99</sup> In 1778, the Virginia assembly had passed their own importation act, suggesting that by the late eighteenth-century, slaveholders no longer relied

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<sup>96</sup> John Craig Hammond, "Slavery, Settlement, and Empire: The Expansion and Growth of Slavery in the Interior of the North American Continent, 1770-1820," *Journal of the Early Republic* 32, no. 2 (2012): 181-189.

<sup>97</sup> John Komlos and Bjorn Alecke, "The Economics of Antebellum Slave Heights Reconsidered," *The Journal of Interdisciplinary History* 26, no. 3 (1996): 443-446.

<sup>98</sup> This was the second time the U.S. banned the African slave trade. The first time was just after the declaration of war in 1774. As a temporary measure, after the end of the Revolutionary War, some states reopened their borders to slave ships carrying African slaves. The 1807 ban was a much more sweeping and final edict. Steven Deyle, *Carry Me Back: The Domestic Slave Trade in American Life* (Oxford: Oxford University Press, 2005), 17-19.

<sup>99</sup> James Sidbury, *Ploughshares into Swords: Race, Rebellion, and Identity in Gabriel's Virginia, 1730-1810* (Cambridge: Cambridge University Press, 1997), 59-94.

upon the external market to supply slaves.<sup>100</sup> For those who were in search of slaves, they turned to the domestic market, preferring African-American slaves used to the North American climate.

The growth of the domestic slave trade at the turn of the nineteenth century encouraged slaveholders to view enslaved children as valuable at an earlier and earlier age.<sup>101</sup> As a consequence of the growth of the market, enslaved children were sold as individuals, instead of as part of a family or as part of a group of children.<sup>102</sup> WPA respondents themselves were sold as young as five years old—although the average age was around ten.<sup>103</sup> Even if they were not traded, sold, or auctioned, they were put to work or hired out to nearby slaveholdings. Slaveholders prepared their slaves for these paths by providing them rations at earlier and earlier ages.

Slaveholders continued the practice of depriving enslaved infants until emancipation in the 1860s. They waited until enslaved infants survived infancy, whether by sheer luck or by the ingenuity and sacrifice of their parents. But as the internal slave market grew through the 1820s, and technology made certain agricultural tasks light enough for even children, slaveholders pushed the age at which children received individual rations farther back into their early childhood, lifting them from an externally imposed starvation so that, in a short time, they could be dragged into the labour pool of the slaveholding. Paradoxically, as slaveholders forced these

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<sup>100</sup> Deyle, *Carry Me Back*, 23.

<sup>101</sup> See Tim Thornton's testimony: the slaveholders "treated de children well on the plantation. They got more work out of young people when they were spry, and they brought better prices if they was sold." Also, Alexander Kelley, whose siblings were "taken away as fast as they became of profitable age." The price of "a matured man slave of good physique and steady temper and average working ability, and not disposed to run away, was worth in the slave market as high as \$3000. That is why," he concluded, "we slaves were always well fed." AS:SS1:4:2:612; AS:SS1:5:104.

<sup>102</sup> Daina Ramey Berry, *The Price for Their Pound of Flesh: The Value of the Enslaved, from Womb to Grave, in the Building of a Nation* (Boston: Beacon Press, 2017), 47-48.

<sup>103</sup> Berry, *The Price for Their Pound of Flesh*, 83-86. Berry makes a quick note that poor diet and work conditions was responsible for the low appraisal value of enslaved children (relative to adult slaves) but she does not elaborate on regional variation. *Ibid*, 46.

children to work, regardless of the increased diet, they blunted whatever recovery these enslaved children could have gained. Just as these children were finally able, even at the jostling trough, to eat their fill, they also found themselves working from sunup to sundown. This experience, of course, varied within and across regions.

The work assigned to children differed according to the degree of crop diversification of the slaveholding. Crops such as cotton, rice, and sugar demanded more physical exertion from enslaved adults and children.<sup>104</sup> In addition, these crops tend to grow more easily in warmer climates with less pronounced seasons. Crops such as tobacco and wheat, which were among the most popular choices with farmers in the cold south, have more distinct seasons and exert less demands on their labourers. In the cold south, the margin of difference between slaveholdings was narrower, particularly because by the early nineteenth century, besides a handful of counties, most farms practiced mixed-crop agriculture.<sup>105</sup> These slaveholdings typically grew a mixture of tobacco, wheat, and corn, with some land dedicated to cotton. The physical demands and seasonality of these crops imparted enslaved children in the cold south with less demanding work and longer periods of rest than enslaved children in the warm south. As the cold decade lengthened the off-season during the winter for those above the thirty-ninth parallel, it exaggerated differences between children in the cold south and those in the warm south.

The physical work that enslaved children were tasked to do influenced their growth patterns. Richard Steckel, Robert Fogel, and historian Eric Schneider's work demonstrates the delicacy of the caloric balance between physical exertion and food (see fig.3 and fig.4). Once enslaved children were compelled to run errands, their initial increase in height stagnated. A

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<sup>104</sup> King, *Stolen Childhood*, 85.

<sup>105</sup> Lorena S. Walsh, "Slave Life, Slave Society, and Tobacco Production in the Tidewater Chesapeake, 1620-1820," in *Cultivation and Culture: Labor and the Shaping of Slave Life in the Americas*, eds. Ira Berlin and Philip D. Morgan (Charlottesville, VA.: University Press of Virginia, 1993), 191; Roberts, *Slavery and the Enlightenment*, 90.



slowdown in height growth is typical around this age until adolescence, but, given the context, the bodies of enslaved children likely compensated for the physical (and psychological) stress of labour so soon after deprivation by allocating metabolic resources away from growing.<sup>106</sup> As they adapted to this stress, their bodies could once again allocate resources towards height. Once these children entered adolescence, they entered the adult workforce, and their body once again re-allocated resources. When slaveholders increased their rations to match that of their adult kin, their height rises once more. The onset of work is responsible for the plateaus in height.<sup>107</sup> But while the average Virginian slave likely struggled with the onset of work in childhood because that work was not taxing and was limited by season, this plot likely does not apply to those enslaved in the cold south.

Enslaved children began work at around five years old, a process which historian Wilma Dunaway calls the “early work socialization of slave children.”<sup>108</sup> Work comprised of several tasks, and the type of work depended on the size and location of the slaveholding as well as its main crop. Mixed-crop agriculture that characterized slaveholdings in the cold south demanded less from assisting children, requiring tasks that were less physically intense. Enslaved children were compelled to work in the house and on the field to prepare them for the full adult workload, but some were at the mercy of slaveholders who made clear through the act and threat of whipping that their work as children held the same standards as that which was assigned to adult slaves.<sup>109</sup> But alongside the type of forced labour, the types of crops the slaveholdings grew also determined the extent of the brutality of the work. Cold south slaveholdings focused on summer

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<sup>106</sup> Richard Steckel, “Biological Measures of the Standard of Living,” *The Journal of Economic Perspectives* 22, no. 1 (2008): 135.

<sup>107</sup> Another variable that influenced these two plateaus was the addition of enslaved children who were even more deprived than the average. The subsequent steep incline can also be explained by the eventual death of children who simply could not surmount their past or survive their present.

<sup>108</sup> Dunaway, *The African-American Family*, 72-74.

<sup>109</sup> King, *Stolen Childhood*, 85-86.

tobacco and winter wheat, the bulk of the labour of which did not begin before March or extend past October, as did cotton and rice. Many slaveholdings grew cotton for their own use, but in the early nineteenth century cold south, few had yet focused on cotton as their principal crop.

In the cold south, from the late eighteenth century onward, these crops were tobacco, wheat, and corn.<sup>110</sup> Tobacco was grown with the traditional harvest year, from spring to autumn, corn grown alongside it, and wheat, sown in the autumn, was attended through the winter, spring, and summer months.<sup>111</sup> Growing tobacco and wheat, for enslaved children, was somewhat light, though tedious, seasonal fieldwork, taking up the time of many adult slaves.<sup>112</sup> In comparison to fieldwork on a cotton or sugar plantation, the seasonality of cold south farms ensured that enslaved children there did not completely exhaust the precious energy that they accumulated from their rations.<sup>113</sup>

During the growing season, enslaved children were expected to work. While adult slaves performed the most arduous fieldwork, slaveholders made use of enslaved children, and particularly of their small size, on the field. Slaveholders assigned tasks with the understanding that enslaved children may not have the necessary strength to complete more arduous tasks. Businesses targeted slaveholders who wished to use the labour of children without taxing them before their prime. One such enterpriser, Emanuel Parson, was a fan-maker, who made fans for

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<sup>110</sup> Kulikoff, *Tobacco and Slaves*, 120; Walsh, “Slaves and Tobacco in the Chesapeake,” 192-194.

<sup>111</sup> Morgan, *Slave Counterpoint*, 174-175.

<sup>112</sup> One consequence of the constant work required for tobacco and other diversified slaveholdings was that the hours enslaved workers had occupied opened positions for children to assist in the slaveholder’s home. Most children enslaved in the cold south participated in work in the house and on the field. Work assignments in the home were less physically strenuous as fieldwork. Dunaway, *The African-American Family*, 72.

<sup>113</sup> “The demands of tobacco were tedious and monotonous; those of sugar literally killing.” Tobacco plots were small and isolated, subject to soil type and human intervention, while cotton plots could be large, requiring longer hours for upkeep with hoeing and plowing in comparison to tobacco. Cotton was also less fragile than tobacco, which encouraged the use of child labour on cotton plantations because it did not require skilled hands. Ira Berlin and Philip D. Morgan, “Labor and the Shaping of Slave Life in the Americas,” in *Cultivation and Culture*, 10; Joseph P. Reidy, “Obligation and Right: Patterns of Labor, Subsistence, and Exchange in the Cotton Belt of Georgia, 1790-1860,” in *Cultivation and Culture*, 139.

wheat drying. An advertisement for this business in Virginia's *Genius of Liberty* newspaper assured potential buyers that "if properly worked [the fans] clean four hundred bushels of wheat per day—they may be turned with ease, by a boy of 12 years of age."<sup>114</sup> Although Parson's claims were probably exaggerated, it reveals concerns held by slaveholders about the physical ability of enslaved children. That slaveholders were concerned with what work enslaved children could do well does not mean that slaveholders restrained them from work altogether. Rather, slaveholders used enslaved children for tasks that required a smaller physique.

Planters forced enslaved children to pick worms off of tobacco plants because they were small enough to slip between the crops and swat away pests or burn insect eggs.<sup>115</sup> Former slave Georgina Giwbs, who was enslaved on a mixed-crop Virginia plantation, was eight years old when she "started working in de field wif two paddles to keep de crows from eatin' de crops."<sup>116</sup> Children removed weeds from other growing plants such as corn, with some slaveholders providing miniature hoes for such work.<sup>117</sup> During the harvest season, enslaved children pulled corn from low-growing husks and stacked and dried cut wheat.<sup>118</sup> They assisted field hands: the "young[er] children ran errands and sorted tobacco, women and older children worked at the monotonous task of stemming."<sup>119</sup> Children's work was limited to what they, with their small stature and minimal strength, could accomplish and, in the cold south, this was limited by

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<sup>114</sup> "WHEAT FANS," *Genius of Liberty*, 11 January 1817.

<sup>115</sup> King, *Stolen Childhood*, 86; Morgan, *Slave Counterpoint*, 198; Swanson, *A Golden Weed*, 36-37.

<sup>116</sup> AS:17:15.

<sup>117</sup> Enslaved in Georgia, WPA respondent Andrew Moss claimed children had "little hoes" for weed removal and "walked many a mile...up and down de rows, followin' de grownfolks." Andrew Moss in King, *Stolen Childhood*, 85.

<sup>118</sup> King, *Stolen Childhood*, 93.

<sup>119</sup> Swanson, *A Golden Weed*, 70.

season. Both limitations allowed enslaved children in the cold south, regardless of slaveholding size, with less arduous work than children in the warm south.<sup>120</sup>

In addition to the demands of the crop and its market, the seasonality of their environment also exerted influence. Unlike their parents or adult kin, the tasks described by former slaves suggest that as children they were not at work all year. Weed removal is paramount at the initial stage of plant growth in late spring, clearing pests from tobacco plants was most important in late summer, and the harvest, one of the lighter work tasks for children, occurred in early autumn. Enslaved children continued to assist their adult kin around the slaveholding through autumn and winter, but when WPA respondents who were enslaved in the cold south described work, they typically framed this work in the context of the growing season, which was not as long as it was in the warm south.

Beginning in 1809, this seasonality became more pronounced for those living in the cold south. The climatic events of the cold decade meant that sudden frosts in April and May could wipe out their new crops and damage the winter wheat set to be harvested over the summer. Thus, the planting season was pushed to May, and, over the 1810s, increasingly towards June. Enslaved children then did not spend as much time helping in the fields. Tobacco crops did not need to be de-wormed until late June or even July. While still dealing with the realities of enslavement, enslaved children in the cold south spent the spring waiting for the beginnings of the growing season and keeping busy with lighter tasks, such as carrying water and wood around the yard.<sup>121</sup> As a result of this slight advantage in periodic rest, once they had recovered from the

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<sup>120</sup> Single-crop slaveholdings in the deep south demanded more taxing work and longer hours of enslaved children than slaveholdings that grew multiple crops.

<sup>121</sup> Thomas H. Jones, "The Experience of Rev. Thomas H. Jones" in *From Bondage to Belonging: The Worcester Slave Narratives*, eds. B. Eugene McCarthy and Thomas L. Doughton (Amherst, MA.: University of Massachusetts Press, 2007), 131.

metabolic damage of deprivation from their early childhood years, enslaved children in the cold south did not experience a delay in growth until their entry into the adult workforce in their adolescence.

This alleviation from work allowed enslaved children to catch up on the sleep they missed because of the long summer hours. In the warm south, where seasons were less pronounced, enslaved children did not work seasonally but according to the demands of the crop. On slaveholdings which grew crops with long growing seasons, such as cotton or sugar, enslaved children did not see this seasonal period of relative rest. For George Washington Browning, who was enslaved in Georgia, cotton agriculture was a year-round endeavour: “There was very little cotton raised, consequently, the work in the winter was much lighter.”<sup>122</sup> In the lowcountry, children enslaved on rice plantations spent the season before planting “clearing ditches and building canals” alongside enslaved adults.<sup>123</sup> This grueling work could not be imagined as a social pastime in the same manner that hunting lingered in the minds of the formerly enslaved. Enslaved children on these single-crop slaveholdings did not see an off-season as those enslaved further north had.

The phenomenon of the Virginia increase can help explain this data pertaining to the general slave population. Enslaved children were simply working too long in conditions that required more rest than they were given. An increase in rations in some ways could have lessened the physiological impact of the slaveholder’s demands. However, ultimately, labour demands delayed the full recovery of enslaved children. The plateaus in height averages should be interpreted as moments in which whatever benefits a young child accrued from a sudden

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<sup>122</sup> AS:SS1:3:1:112.

<sup>123</sup> King, *Stolen Childhood*, 89.

increase in provision temporarily disappeared as the consequent increase in consistent physical activity impacted their height development.

As for explaining the phenomenon itself, using the environment as a framework brings regional differences into focus. Crop culture influenced the health of slaves, but the region-specific foods assisted in creating the edge that Virginian men held on other enslaved adults. Consistent rations also assisted in building the foundation from which enslaved children could then fully recover during adolescence. For severely deprived enslaved infants, consistency was likely as important as quantity. The human body performs most efficiently under consistent conditions. To repair the damage wrought by near starvation in the early years, adequate and consistent consumption would have been required.<sup>124</sup> Before slaveholders marshalled enslaved children into the work force at the age of five, they first established a consistent routine of meals, feeding these children largely milk and cornbread until they were in their early adolescence.

Rest and food were crucial to the Virginia increase. The cold decade cushioned the physical wear of slavery on enslaved children. But by providing the environmental conditions in which enslaved children could recover and become somewhat healthier than generations previous, the cold decade also increased the value of enslaved children to slaveholders. Milk provided additional vitamin D and calories throughout the year. But by the winter, there would be less and less vitamin D preformed in the milk available. Because cows were no longer outside, as a product of the harsher winters in the 1810s, and without fresh grass, the milk in the fall and early spring did not have the same levels of vitamin D. So how did enslaved children survive the winter and begin to consistently grow over the course of the next generation?

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<sup>124</sup> Historical scientists observed a rapid recovery in starved children with little effect on adult height, and similar observations were recorded in under-nourished Japanese populations following the end of the World War II. Hermanussen, Bogin, and Sheffler, "Stunting, starvation and refeeding," 1173.

Crucially, as the cold “volcanic” decade cloaked the northern hemisphere in a cloud of sulphur and other particles, how did they make up for the reduction in UV radiation?

Rations of preserved oily fish at crucial times in the year were in part responsible for supporting the health of enslaved African-Americans through the cold decade. Older enslaved children entered the fall season, when UV radiation was rapidly diminishing, with their serum levels of vitamin D boosted by the consumption of preserved herring. These extraneous rations allowed enslaved children to survive and even thrive through the winter and spring season.

Coupled with consistent milk rations, enslaved children in the cold south began to see real effects on their health even in the depths of the cold decade. Preserved fish is not often associated with historical African-American cuisine, but, just as this chapter demonstrated that milk was historically and long consumed in West Africa, this next chapter will show the same follows for preserved fish.

## CHAPTER 4      HALF A HERRING

Fugitive slave Charles Ball, enslaved and hungry in South Carolina in 1805, set up a weir in a nearby river to make up for the meagre rations at hand. He returned the following week to enough fish to fill half a bushel.<sup>1</sup> Inspired, his slaveholder decided to send out slaves on regular fishing trips. This casual fishing party evolved soon into a shad fishery, but the enslaved fishermen would eat little shad themselves.<sup>2</sup> Being hired out to the fishery meant that these slaves saw plenty of “common river fish,” but had nothing with which to fry this fish.<sup>3</sup>

Ball disparaged the season-specific provisions, writing that “a broiled fresh-water fish is not very good, at best, without salt or oil; and after we had eaten them every day, for a week, we cared very little for them.”<sup>4</sup> In contrast to this common fish, Ball praised shad: “We could have lived well, if we had been permitted to broil the shad on the coals, and eat them; for a fat shad will dress itself in being broiled, and is very good, without any oily substance added to it.”<sup>5</sup> But the shad was carted away three times a day during the fishing season. Once the fishery was set up, Ball and his fellow fishermen were left with nothing but the “heads and roes of the shad.”<sup>6</sup>

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<sup>1</sup> Charles Ball, *Slavery in the United States: A Narrative of the Life and Adventures of Charles Ball, a Black Man, Who Lived Forty Years in Maryland, South Carolina and Georgia, as a Slave Under Various Masters, and was One Year in the Navy with Commodore Barney, During the Late War* (New York: Brick Church Chapel, 1837), 277.

<sup>2</sup> They worked long, hard, and nocturnal hours, “sixteen hours every day, including Sunday; for in the fishing season, no respect is paid to Sunday by fishermen, anywhere.” Their largest meal was eaten at midnight. Charles Ball, *Slavery in the United States*, 295.

<sup>3</sup> *Ibid.*, 294.

<sup>4</sup> *Ibid.*, 295.

<sup>5</sup> *Ibid.*, 294.

<sup>6</sup> It is likely the complete absence of fat in the fishermen’s diet, rather than simply the meagre size of these cuts, that led them to protest their rations. Ironically, liver and roe are the cuts of fish that contain the highest amounts of vitamin D, but given that the fish liver and skein, the membrane in which fish roe is contained, are generally around an inch in length and diameter, these fishermen would not have brought these cuts home to their children but eaten them as is at shore. Shad roe can be eaten fresh. In terms of other dietary sources of important minerals, such as zinc, oysters would have been a welcome addition in the winter, but, in comparison to more southern coastal slaveholdings, WPA respondents enslaved on the cold coast did not mention oysters or shellfish to a similar degree. Harriet Benton, who was enslaved in Georgia, recalled how her father, “a native of the tide-water region of Virginia...often spoke of the fine fish and oysters that he used to catch and enjoy when a boy. During the 1830’s, when he was a young man, Yankee speculators caught (kidnapped) my father, brought him South, and sold him into



The fillets were sent off to be processed for sale or for consumption on the plantation. After the fishing season ended in the middle of April, the slaveholder allowed them “a shad every Sunday evening with [a] peck of corn. The fish were those that [Ball] had caught in the spring; and were tolerably preserved.”<sup>7</sup>

Ball’s narrative is rife with mentions of fresh fish, from “broiled herring” to “fried fish,” and “cat, perch, mullets, and . . . pikes” roasted over coals at a riverbank.<sup>8</sup> But why did Ball disdain the lean freshwater fish so? In West Africa, wherever his grandparents or great-grandparents had been taken, most fish were lean. How and why did these preferences change? I argue that these changes were initiated by differences in geography; bonded and enslaved Africans arriving through the seventeenth century to the cold south, and even colder regions, had to suddenly make do with a cold and sunless climate, and they made do by supplementing with fatty animal foods replete with vitamin D. During the cold decade, when ash particles clouded the planet, enslaved African-Americans did more than just make do. The Virginia height increase demonstrates that these strategies did in fact work.

But the knowledge behind these strategies has for the most part disappeared. Today, fattier fish, what we call now oily fish, is associated with East Asian cultures, particularly Japanese cuisine. In the canon of African-American cuisine, leaner fish, like catfish and crawfish, reign supreme, but by the end of this chapter, I hope to establish the significance of preserved herring to the diet of the enslaved in the cold south.<sup>9</sup> Though herring was fished and

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slavery.” AS:SS1:3:1:45; Ball, *Slavery in the United States*, 314, 316; G.E. Bledsoe, C.D. Bledsoe, and B. Rasco, “Caviars and Fish Roe Products,” *Critical Reviews in Food Science and Nutrition* 43, no. 3 (2003): 324, 327; Suhendan Mol and Sabahat Turan, “Comparison of Proximate, Fatty Acid and Amino Acid Compositions of Various Types of Fish Roes,” *International Journal of Food Properties* 11, no. 3 (2008): 674.

<sup>7</sup> Ball, *Slavery in the United States*, 319.

<sup>8</sup> Ibid, 316.

<sup>9</sup> Herring refers to a family of different oily fish species, but this thesis will concern itself with the Atlantic herring species (*Clupea harengus*). For more on the topographic similarities between Virginia, Maryland, and North Carolina, see the introduction.

processed in the spring, outside of slaveholdings that distributed only herring, slaveholders used herring to boost slave rations during the harvest season. This timing was crucial to older enslaved children and adolescents working through the harvest season while UV radiation dwindled in the cold south. Along with the milk rations through the spring, summer, and fall, preserved herring augmented the blood serum levels of enslaved children and prepped them to work through the late fall.

Late eighteenth- and early nineteenth-century slaveholdings, such as the one in South Carolina on which Charles Ball was enslaved and his first slaveholding in Maryland, themselves produced the salt herring they distributed. Slaves did not see the fruit of this fish immediately, unless they took matters into their own hands, as did Charles. Herring, shad, mackerel, and other coldwater fish went into storage or were packed for sale. Once the river flowed freely enough for the herring and shad to begin their migration towards the ocean, in February and March, the fishing season commenced. On cold-south slaveholdings, the preparation for the tobacco growing season also busied slaves during peak fishing season. Sometime between December and February, the fields had to be cleared and prepared for tobacco with a delicate balance of wood ash and lime. March marked the starting of seedlings, which would be transplanted when the ground had warmed in April or May and after a good rain.<sup>10</sup> Despite the potential profits to be reaped from selling barrels of preserved fish, the organization of tobacco season took precedence over an organized fish production.

But during the cold decade, the growing season was shortened. Slaveholders, and especially tobacco-growing slaveholders, could not afford a frost decimating the crucial planting

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<sup>10</sup> Philip D. Morgan, *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake and Lowcountry* (Chapel Hill: University of North Carolina Press, 1998), 166; Drew A. Swanson, *A Golden Weed: Tobacco and Environment in the Piedmont South* (New Haven: Yale University Press, 2014), 34-35.

period. The threat of frost then likely lowered the labour demands in the spring. With the planting season pushed to late May or even June, in comparison to April and May in the late eighteenth century, slaves suddenly had the time to fish for supplementation in the winter. Farmers who took their chances planting in April and May had to deal with extremely dry conditions and sudden frosts that wiped out seedlings.<sup>11</sup> Thomas Jefferson noted a series of unfortunate growing seasons throughout the 1810s. Virginia in the first half of the decade saw frost increasingly later in the spring as well as periods of downpour followed by drought. On May 30, 1809, Thomas Jefferson observed “frost in the [neighborhood] to bite tobacco plants.”<sup>12</sup> The weather had dropped nearly twenty degrees Fahrenheit from the day before.

It seems safe to speculate that the expectation of the labour demands of the enslaved in such a growing season would have ranged from quite little to, for those with unreasonable or desperate slaveholders, lugging water to and from the tobacco seedbeds and wheat fields across the slaveholding’s estate. Once a pattern of unusual climate had emerged in 1810 and 1811, the expectations of when the growing season began likely changed. As the growing season shortened, the planting and harvest period might have overlapped significantly. Slaveholders who provided additional rations during the harvest period may have begun providing these rations earlier and earlier through the first half of the 1810s. To understand how these additional foods may have increased the average height of enslaved men, we must look at foods containing specific micronutrients that encourage bone health and other physiological aspects to growth. Oily fish is one of these foods, and it is a food that expansive histories of slave health, such as the work of Kenneth Kiple and Virginia King, have not explored. This chapter seeks to argue

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<sup>11</sup> See Chapter 2.

<sup>12</sup> Thomas Jefferson 1809 May 1 – 1809 June 30. Daily Record, 1 November 1802-29 June 1826.

that the consumption of oily fish, such as herring, also contributed to the growth of enslaved people in the cold south.

Through the cold south, former slaves recounted eating salt and red herring, which differ in quantity as well as preparation. Red herring was the whole herring, head and tail attached and guts removed, that was cured for a shorter amount and then smoked for so long that the flesh turned a deep red.<sup>13</sup> After losing between 15 to 20 percent of its hanging weight, one red herring weighed 544 grams, or 1.2 pounds, resulting in around 165 IUs of vitamin D.<sup>14</sup> Salt herring was prepared by gutting it, removing the spine, head, and tail, and adding it to a brine with enough salt to preserve the fillets during long transatlantic journeys.<sup>15</sup> Keeping the body in water likely allowed the herring to remain within 85 to 90 percent of its hanging weight. One whole salt herring would contain, to be conservative, the same amounts of vitamin D as red herring. In some cases, former slaves recounted how they were given half of a salt herring. This points to the slaveholder rationing salt herring fillets, suggesting that herring was not typically filleted for preservation in the tidewater and piedmont. In such case, the vitamin D amount would be 83 IU

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<sup>13</sup> Kathy Hunt, *Herring: A Global History* (London: Reaktion Books, 2017), 53-54.

<sup>14</sup> Raw Atlantic herring has roughly 275 IU of vitamin D per kilogram or roughly 138 IU per pound or 454 grams, and typically weighs around one to two pounds. IU is the measurable activity of useable vitamin D within a substance. In addition, vitamin D is one of the most stable compounds in animal foods. That is to say, when a product naturally containing vitamin D is subject to certain temperatures, such as high as those used in cooking or the low temperatures used in smoking, the vitamin D content of said product does not change significantly. See Table 4 in Schmid and Walther, "Natural vitamin D content in animal products," 459; *Ibid*, 460; Tarja L. Aro et al., "Fatty Acids and Fat-Soluble Vitamins in Salted Herring (*Clupea harengus*) Products," *Journal of Agricultural and Food Chemistry* 53, no. 5 (2005): 1482-1488. For weight of Atlantic herring, see the following study about the declining weight of Atlantic herring in modern day catches. I estimate nineteenth-century Atlantic herring weight at 1.5 lbs per hanging weight after gutting and before processing. M. Cardinale and F. Arrhenius, "Decreasing weight-at-age of Atlantic herring (*Clupea harengus*) from the Baltic Sea between 1986 and 1996: a statistical analysis," *ICES Journal of Marine Science* 57, no. 4, (2000): 882-893. Shad, a species of herring, was much larger than Atlantic herring, with contemporary accounts describing whole shad as nearly a meter long. Slaves at Mount Vernon who received preserved shad in place of herring may have still reached the same levels as other slaves who consumed herring. Mark McWilliams, "Shad Planking: the Strangely American Story of a Smoked Fish," in *Cured, Smoked, and Fermented: Proceedings of the Oxford Symposium on Food*, edited by Helen Saberi (Devon, UK: Prospect Books, 2011), 201.

<sup>15</sup> Hunt, *Herring*, 49-50.

per half fillet. However, when slaves referred to herring, unless otherwise stated, they were discussing whole herring, with the head and tail attached.

Both salt and red herring were familiar rations for newly enslaved Africans who arrived in colonial America. Enslaved Africans, who were forcibly migrated from their shores to the West Indies, and then once more to America, brought with them culinary skills and traditions.<sup>16</sup> These methods reflected a dynamic economic reality that had undergone and would undergo significant change through the peak of the transatlantic slave trade. Dried and preserved fish were significant in the diet of coastal and riverine societies in early modern West Africa, and particularly in the regions from which most of the grandparents and great-grandparents of nineteenth-century slaves were trafficked. Much of the adaptation of West African culinary traditions occurred because of the Middle Passage, but the prominence of preserved fish in the diet of cold-south slaves was driven by the resources available and changes in the climate of the northern hemisphere across the centuries.

In the late seventeenth- and early eighteenth-centuries, most of the enslaved Africans trafficked to Virginia were Igbo and Mande speakers sold and shipped from Senegambia and the Bight of Biafra.<sup>17</sup> These regions are located along the West African coast, close to major rivers that feed into the Atlantic Ocean. The Gambia River and the Senegal River form drainage basins in the forested area that covers much of the westernmost African coast. The Niger River is

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<sup>16</sup> Jessica B. Harris, *High on the Hog: A Culinary Journey from Africa to America* (New York: Bloomsbury, 2012), ch. 1; Adrian Miller, *Soul Food: The Surprising Story of an American Cuisine One Plate at a Time* (Chapel Hill: University of North Carolina Press, 2017), ch. 2; Anne E. Yentsch, *A Chesapeake Family and Their Slaves: A Study in Historical Archaeology* (Cambridge: Cambridge University Press, 1994), 202-208.

<sup>17</sup> Robert L. Hall, "Africa and the American South: Culinary Connections," *The Southern Quarterly* 44, no. 2 (2007): 27; Kulikoff, *Tobacco and Slaves*, 321. A few other regions in West Africa are represented in the slave trade to Virginia at the turn of the eighteenth century. In the 1710s, Africans trafficked from the Gold Coast and Madagascar outnumbered those trafficked from the Bight of Biafra, but from that point on, until Virginia banned the importation of enslaved Africans in 1778, enslaved Africans from Senegambia and Bight of Biafra make up a larger percentage of those brought to Virginia. Steven Deyle, *Carry Me Back: The Domestic Slave Trade in American Life* (Oxford: Oxford University Press, 2005), 23; Morgan, *Slave Counterpoint*, 64.

the major river of West Africa, with its drainage basin covering millions of square miles from modern-day Sierra Leone, up to Mali, and finally flowing into the Atlantic Ocean near the Bight of Biafra through the Niger Delta. The mouths of these rivers, at the coast, supplied the kingdoms and empires of the interior, both West and North African, with fish to be dried. The Niger Delta in particular was a hotspot of the dried fish trade.<sup>18</sup> The Africans sold from coastal cities, like Calabar in the Niger Delta, were not necessarily Africans local to the area. They were brought in from the towns and villages near the rivers that, like the waterways in the nineteenth-century piedmont, acted as the arteries of trade.<sup>19</sup>

Just as eighteenth-century and nineteenth-century slaves skillfully transported narrow canoes loaded with barrels of tobacco down the Dan and Staunton River, the Niger River saw much of West African trade itself. Alongside the coastal fishermen who sold fish and sent it downriver from the Igbo territories at the Niger Delta, sixteenth- and seventeenth-century kingdoms along the river, such as the ever-expanding kingdoms of Benin and Oyo-Yoruba, also participated in the fish trade and used the riverine system to transport goods, such as gold, cloth, and crops.<sup>20</sup> As the Portuguese flirted along the coast in the late fifteenth and sixteenth century, they bought up goods brought from inland to the coastal markets for sale—just as the slave ships after them would.<sup>21</sup>

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<sup>18</sup> David Northrup summarizes: “Large portions of the Delta are too swampy and saline to support much agriculture or livestock; the hinterland lacks natural salt deposits, so that salt, along with dried fish, must be exchanged for agricultural and animal surplus.” David Northrup, “The Growth of Trade among the Igbo before 1800,” *The Journal of African History* 13, no. 2 (1972): 220.

<sup>19</sup> Northrup, “The Growth of Trade among the Igbo before 1800,” 232-233.

<sup>20</sup> Green, *A Fistful of Shells*, 149-150; Swanson, *A Golden Weed*, 26-27, 40-42.

<sup>21</sup> That is not to say that West African empires did not utilize the coast for economic reasons, but that, just at the moment in which these European states were becoming more attractive economically to West African empires, the major economic route was eastward, and even northward, through the Sahara, even if goods were due to European markets. For more on this trade, concentrated on gold exports, see Toby Green, *A Fistful of Shells: West Africa from the Rise of the Slave Trade to the Age of Revolution* (Chicago: University of Chicago Press, 2019), 35-39.

Though agriculture provided the bulk of the crop trade, dried fish was a staple of the market. West Africans fished seasonally for both subsistence and to trade at market.<sup>22</sup> To prepare their catch, they smoked, salted, pickled, broiled, roasted, baked, and fried it.<sup>23</sup> In both Senegambia and the coastal areas surrounding the Bight of Biafra, West African fishermen were concentrated at the coast. American slave trader Joseph Hawkins, traveling in the late eighteenth-century to the Bight of Biafra, noted how the rivers were full of “lobsters, crabs, prawns, crayfish, soles, mullets, &c.”<sup>24</sup> Hawkins was likely traveling around the mouth of the bight, near the Niger Delta, where increased salinity of the waterways make for abundant salt, as well as abundant shellfish and saltwater fish. These species are not as fatty as the shad so prized in Charles Ball’s narrative nor as much as the herring that bulked the diet of slaves at Mount Vernon.<sup>25</sup> These regions are just a few degrees north of the equator, at which latitude even deeply pigmented individuals can draw enough vitamin D from sunlight alone.

West African foods choices reflect the environment in which their foodways emerged. One observer stated that the villagers along the Gambia River ate mostly rice, palm oil, and small fowl, along with other game and “several kinds of fish.”<sup>26</sup> This wealth of choice in game and other animal meats is deceptive. Seasonality affected patterns of consumption of any animal food: “during harvesttime, meat was eaten three times a day. After the harvest, women used meat

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<sup>22</sup> Herbert C. Covey and Dwight Eissnach, *What the Slaves Ate: Recollections of African American Foods and Foodways from Slave Narratives* (Santa Barbara, CA: Greenwood Press, 2009), 41. Further south, in Central Africa, Hawkins observed how coastal groups, nearer to modern-day Congo, enjoyed dried and smoked mullet with a “palm-oil and hot pepper marinade.” Joseph Hawkins in Frederick Opie. *Hog & Hominy: Soul Food from Africa to America* (New York: Columbia University Press, 2008), 8-9.

<sup>23</sup> Opie, *Hog and Hominy*, 10, 51; Twitty, “The Birth of African American Foodways,” 333.

<sup>24</sup> Joseph Hawkins quoted in Opie, *Hog and Hominy*, 8.

<sup>25</sup> Mullet roe and liver do contain significant amounts of vitamin D, but there is not much on the consumption of these parts. Given that most fish was consumed dried, smoked, or salted, one can assume that the fish was sold for its flesh.

<sup>26</sup> Hall, “Culinary Connections,” 23.

sparingly as seasoning in stews and sauces rather than the main course.”<sup>27</sup> The fish here was used as a condiment more than a substantial component of a meal. As we will see, on the Middle Passage, female African cooks practiced the same cost-saving measures in the slave ship kitchen as they did back home, when resources were scarce. The rationing of fillets common to the nineteenth century south is representative of the colder environment and season in which enslaved African and African-Americans fished.

Coastal communities along the West African coasts took an extra step in their processing methods by fermenting the fish in the sun. The result did not appeal to a certain subset of western Europeans. During his ventures down to the Gold Coast, now modern-day Ghana, in the seventeenth century, Dutch trader Willem Bosman remarked on the use of a “stinking fish...dry’d and smoak’d.”<sup>28</sup> A Dutch observer, Pieter de Marees, travelling the coast at the same time, also turned up his nose to the “stinking Fish, dried in the Sun.”<sup>29</sup> Culinary historian Michael Twitty astutely likens this to the ancient Roman fermented fish condiment, garum, but he does not speculate on whether this fish underwent a similar fermentation transformation. Many of these European observers characterize the fish as rotten.<sup>30</sup> The process of fermentation is controlled rot, and, though this is a well-known process today, in early modern West Africa, knowledge of this process was likely transferred from one generation to the next. The population of enslaved Africans trafficked from this coast were largely young and may not have had the opportunity to learn or even perfect these processes.<sup>31</sup>

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<sup>27</sup> Opie, *Hog and Hominy*, 14-15.

<sup>28</sup> Willem Bosman in James McMann, *Stirring the Pot*, 117.

<sup>29</sup> Pieter de Marees in Twitty, “The Birth of African American Foodways,” 335.

<sup>30</sup> *Ibid*, 336-337.

<sup>31</sup> Virginian slaveholders preferred to purchase enslaved teenagers, and one in five of the enslaved Africans imported into Virginia were children between ten and twelve. Certain fishing-related skills likely carried over through the Middle Passage because such physical skills were more easily gained and transferable. Phillip Morgan also suggests that knowledge from indigenous Americans may have filled in the gaps. In contrast, fermentation



In his monograph of African cuisine, James McMann notes “herring-like fish[es]” caught by modern-day Ghanaian fisherman in Accra.<sup>32</sup> While it is not clear which fish McMann was discussing, Ghanaians do use a fatty fish to create their fermented fish condiment, *momoni*: the jack mackerel.<sup>33</sup> This fish does have a cold Atlantic equivalent, the Atlantic mackerel, which is quite replete in vitamin D. The jack mackerel contains a significant amount of vitamin D with about 292 IUs per 100 grams.<sup>34</sup> However, its impact on blood serum vitamin D levels is likely low. As it is processed, the mackerel is cut into small pieces roughly 25 grams or so, resulting in around 11 IUs of vitamin D per piece. The finished product as it is used is simply too small to make a significant difference in serum levels of vitamin D.

*Monomi* represents just one of many types of fermented fish condiments used across West Africa today as well as among historical populations that lived in the same spaces.<sup>35</sup> In the seventeenth and eighteenth century, when these Africans arrived in North America, they had to adjust to the new climate and resources available. That Charles Ball came to prefer, or even crave, fattier fish by the nineteenth century demonstrates how palates changed over the course of North America’s settlement and of how nutritional needs and the realities of a mercurial climate required adaptation. The realities of slavery also changed palates. The similarities in food served on the Middle Passage to their homeland may have discouraged bonded and enslaved Africans from continuing their culinary traditions once they arrived in North America.

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requires more specialized knowledge, and experimenting with it without this knowledge carried a much higher risk of mortality. Morgan, *Slave Counterpoint*, 70-72, 242.

<sup>32</sup> McMann, *Stirring the Pot*, 110.

<sup>33</sup> A. I. Sanni, M. Asiedu, and G. S. Ayernor, “Microflora and Chemical Composition of Momoni, a Ghanaian Fermented Fish Condiment,” *Journal of Food Composition and Analysis* 15 (2002): 577-578.

<sup>34</sup> “Fish, mackerel, jack,” United States Department of Agriculture, 2019, <https://fdc.nal.usda.gov/fdc-app.html#/food-details/175121/nutrients>.

<sup>35</sup> A. F. El Sheikha, R. Ray, D. Montet, S. Panda, and W. Worawattanamateekul, “African Fermented Fish Products in Scope of Risks,” *International Food Research Journal* 21, no. 2 (2014): 430-431.

Seventeenth-century and eighteenth-century enslaved Africans encountered the European as well as West African variety of preserved fish on slave ships during the Middle Passage.<sup>36</sup> Their inventories detail how the crew bought dried fish, along with captives, at shore.<sup>37</sup> On slave ships, dried meat rations were likely mashed with palm oil and whatever main starch, or carbohydrate was on board.<sup>38</sup> The individuals responsible for cooking meals for the captive crew were enslaved women. They pounded grain or rice into meal and yam into soft clouds and attempted to tease out palatability, but the ingredients available, and the reality in which they suffered, would have made this difficult. Chained together on a slave ship, William Richardson's slaves had to force down a "slabber sauce...made of chunks of old Irish beef and rotten salt fish stewed to rags and well seasoned with cayenne pepper."<sup>39</sup> This use of preserved fish boosted the bland and fat-less flavour of carbohydrates when there was little less available to make these foods palatable to traumatized individuals. Once enslaved individuals arrived in America, they likely shunned the meals that triggered the trauma of the month-long journey; memory is particularly sensitive to smell.<sup>40</sup>

Whereas preserved fish was eaten across West Africa in a myriad of different methods, oral testimony from ex-slaves tells us that preserved fish was often eaten in the South as a separate component of the dish, rather than as a part of a one-pot meal.<sup>41</sup> The switch from the use of preserved fish as condiments to the provisioning of multiple fish or fillets gave enslaved

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<sup>36</sup> Jessica B. Harris, *High on the Hog: A Culinary Journey from Africa to America* (New York: Bloomsbury, 2012), 32-36.

<sup>37</sup> Covey and Eisnach, *What the Slaves Ate*, 48.

<sup>38</sup> Hall, "Culinary Connections," 25.

<sup>39</sup> William Richardson in Harris, *High on the Hog*, 32.

<sup>40</sup> Tomaso Vecchi and Daniele Gatti, *Memory as Prediction: From Looking Back to Looking Forward* (Cambridge, MA.: MIT Press, 2020), 3.2.

<sup>41</sup> A passing remark by Charles Ball about how enslaved individuals in piedmont Virginia ate corn with "the sauce of a salt herring" suggests that in some places in the late eighteenth-century and early nineteenth century, these foodways seemed to still be intact. Ball, *Slavery in the United States*, 54.

African-Americans the boost in vitamin D necessary for the incoming winter. WPA respondent Cornelius Garner, formerly enslaved on a tidewater slaveholding of at least twenty slaves, stated that “a good eatin’ meal consist o’ fish or fried meat, ‘lasses an’ bread.”<sup>42</sup> He categorized fish and meat as a component of a meal separate from the molasses and bread. Horace Muse, also formerly enslaved in the tidewater, did the same. He described how dinner was served to field hands such as himself, where an “ole woman brung us our dinner to de fiel. She brung bread an’ fish in a big basket an’ a boy brung us water in a gourd.”<sup>43</sup> Muse explicitly stated that this fish was herring, while Garner provided no detail. This testimony, coupled with Ball’s distaste for lean freshwater fish, suggests an evolution of fish consumption brought on by the trauma of the Middle Passage.

When enslaved Africans began to develop roots in America, and a creole population rose in the tidewater, the culinary traditions they passed on in regards to fish preparation involved roasting, broiling, and frying—not the pounding of preserved fish into a starch base that occurred at home and in the bowels of the slave ship kitchen.<sup>44</sup> The geographic reality in the cold south brought a differing set of circumstances, which allowed enslaved Africans to turn away, for the most part, from meals like that which they were forced to eat on the Middle Passage. When Charles Ball was sold off to a trader in 1804, away from his family in Maryland, he dreamt that he was minding his children while his wife, Judah, fried freshly caught fish.<sup>45</sup> By the turn of the

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<sup>42</sup> Charles L. Perdue Jr., Thomas E. Barden, and Robert K. Phillips, eds., *Weevils in the Wheat: Interviews with Virginia Ex-Slaves*, 2nd ed. (Charlottesville: University of Virginia Press, 1994), 102-103.

<sup>43</sup> *Weevils in the Wheat*, 216.

<sup>44</sup> Enslaved cooks fed children “mush,” as we will discuss below, but this meal did not incorporate meat, but liquid protein sources—milk and the broth leftover from the cooking of greens or boiling of meat—that cornbread could easily soak up.<sup>44</sup> Rations for adults had the components of their meal separated, if not, at least, solid. Seasonality, and access to protein, differed in America, and most definitively along the cold coast, and perhaps, hill country in Kentucky and Tennessee. The contrasting seasons brought a variety of animals from which slaveholders and slaves alike could select for consumption. This is not to say that all, not even most, slaveholdings provisioned adequately.

<sup>45</sup> Ball, *Slavery in the United States*, 70-71.

nineteenth century, after nearly two centuries of the transatlantic slave trade to the U.S., and as a result of geography and climate, the culinary tradition had moved from the soft meals eaten in Africa and on the Middle Passage. That Judah had the time to cook these meals suggests a crucial difference between slavery in nineteenth-century rural Maryland and rural South Carolina.

These culinary traditions and food presences were not lost, but in the cold south, as slaveholders rationed at least half or a whole preserved herring to slaves, the need to combine the main components of the dish diminished. Charles Ball observed in the 1810s that salt herring was frequently used as such in “lower Virginia,” where “there, in many places, nothing [else] is allowed to the poor negro, but his peck of corn per week.”<sup>46</sup> George Washington, who owned several fisheries, distributed herring and shad to his slaves as their meat rations.<sup>47</sup> John Thompson, a fugitive slave born in 1812, recalled the provisions for adult slaves including two dozen herrings per week, while children under eight years of age “were not allowed anything.”<sup>48</sup>

While some slaveholders, such as Washington, provisioned herring liberally to adults, they were more circumspect in provisioning to children. Such rations were calculated carefully, and enslaved children were fed a separate diet from their parents until their ability to work as an adult increased their value.<sup>49</sup> As profit-driven individuals, slaveholders sought the most cost-

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<sup>46</sup> Ibid, 54.

<sup>47</sup> Stephen Charles Atkins, “An Archaeological Perspective on the African-American Slave Diet at Mount Vernon’s House for Families” (Master’s thesis, College of William and Mary, 1994), 64; Twitty, “The Birth of African American Foodways,” 338.

<sup>48</sup> John Thompson, “The Life of John Thompson, A Fugitive Slave,” in *From Bondage to Belonging: The Worcester Slave Narratives*, eds. B. Eugene McCarthy and Thomas L. Doughton (Amherst, MA.: University of Massachusetts Press, 2007) 45.

<sup>49</sup> Daina Ramey Berry, *Their Price Per Pound of Flesh: The Value of the Enslaved from Womb to Grace in the Building of a Nation*. Boston: Beacon Press, 2017), ch. 2.

efficient method of provisioning their slaves.<sup>50</sup> Fish were plentiful for most of the year and did not require the feeding and care that livestock did. These considerations came long before the cold decade. In the colonial cold south, salted fish and mackerel made up half to two thirds of the basic meat rations for slaves.<sup>51</sup>

The WPA interviews suggest that nineteenth-century slaves also received three pounds of salt pork a week, similar to amounts historians have suggested were provided in the eighteenth century.<sup>52</sup> The gruelling agricultural schedule influenced the distribution of rations as did geography and seasonality. Archaeological evidence suggests that slaves consumed largely freshwater, not saltwater, fish. Oral testimony and bioarchaeological evidence point to herring as the fish most consistently consumed by slaves in the cold south. The nineteenth century slave narratives also point to preserved herring as the slaveholder provision of choice, but not all these autobiographers describe what method of preservation. Enslaved, in piedmont North Carolina, when James Curry's slaveholder's leftovers were not enough, he and the other slaves were allowed "one herring apiece."<sup>53</sup> Madison Jefferson, a slave who fled from 1850s West Virginia to Canada and then to England, stated that she and her fellow slaves only received "herring" as

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<sup>50</sup> Covey and Eisnach, *What the Slaves Ate*, 130-131; Sam Bowers Hilliard, *Hog meat and Hoecake: Food Supply in the Old South, 1840-1860*, revised ed. (Athens: University of Georgia Press, 2014), 105; Morgan, *Slave Counterpoint*, 137; Opie, *Hog and Hominy*, 47-48.

<sup>51</sup> She constructs this claim from archaeological evidence of slave cabins across the southeast United States where high percentages of identifiable fish remains are located. From this evidence, as well as slave testimony, slaves received salt fish rations even as far down as Mississippi. WPA respondent Lewis Jefferson, who was enslaved in Mississippi, mentions being rationed mackerel after a keg was brought down from nearby Louisiana, but no other interviews mention the consumption of mackerel. Covey and Eisnach, *What the Slaves Ate*, 131; Morgan, *Slave Counterpoint*, 137; Yentsch, *A Chesapeake Family*, 212; AS:SS1:8:3:1139-40.

<sup>52</sup> Levi Pollard in *Weevils in the Wheat*, 227; Frank A. Patterson in AS:2:5:227; Steckel, "Stature and the Standard of Living," 1924; Richard Sutch, "The Treatment Received by American Slaves: A Critical Review of the Evidence Presented in 'Time on the Cross'," *Explorations in Economic History* 12, no. 4 (1975): 360.

<sup>53</sup> John Blassingame, *The Slave Community; Plantation Life in the Antebellum South* (New York: Oxford University Press, 1972), 133.

their meat ration.<sup>54</sup> In tidewater Maryland, Harriet Jacobs' slaveholder rationed meat, corn, and "perhaps a dozen herring" in the summer according to age.<sup>55</sup>

These accounts imply that the herring was preserved. In Curry's case, it would not be possible for the enslaved cook to trot out herring within the hour or so that the slaveholder decided to finish their meal. Fresh herring could not be used as a regular ration year-round, and neither could fresh herring be rationed out in the summer when herring was caught in the spring. Describing his enslavement in tidewater Maryland from 1800 to 1804, like Harriet Jacobs, Charles Ball contextualizes this seasonality of food by grounding it in the geography around him: "As we fortunately lived near both the Patuxent River and the Chesapeake Bay, we had abundance of fish in the spring, and as long as the fishing season continued. After that period, each slave received, in addition to his allowance of corn, one salt herring every day."<sup>56</sup> This seasonality also meant that slaveholders avoided depending on only one kind of protein: "It often happened, that the stock of salt herrings laid up by a master in the spring, was not sufficient to enable him to continue this rate of distribution through the year; and when the fish failed, nothing more than corn was dealt out."<sup>57</sup> Proximity to waterways determined a daily distribution of herring.

This eighteenth and early nineteenth-century trend in provisioning continued through the antebellum period. Slaveholders advised each other to ration herring, referring specifically to salt herring. Writing to a magazine in 1831, a Virginia planter described the meal schedule for his slaves in which "their breakfasts generally consist of bread and milk or salted herring."<sup>58</sup> For this

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<sup>54</sup> Ibid, 219.

<sup>55</sup> Harriet Jacobs, "Incidents in the Life of a Slave Girl," in William L. Andrews and Henry Louis Gates Jr. eds., *Slave Narratives* (New York: Library of America, 2000), 839.

<sup>56</sup> Ball, *Slavery in the United States*, 26.

<sup>57</sup> Ibid, 42-43.

<sup>58</sup> James Breeden, ed., *Advice Among Masters: The Ideal in Slave Management in the Old South* (Westport, Conn.: Greenwood Press, 1980), 90.

planter, salt herring is a substitute for milk, a food that was considered substantial, but also a food that contains lactose, which mimics the role of vitamin D in the mineralization of bones.<sup>59</sup> In 1837, another Virginia planter suggested: “Potatoes, cabbage, turnips, and peas, boiled with beef or bacon, will give your negroes a wholesome meal for breakfast or dinner, at the other, they should have fish, or the same... Occasionally, fresh meat will be required.”<sup>60</sup> When this planter suggests fish, he is referring to preserved fish, most probably salt herring. His advice about the cooking of beef or bacon is similar to testimony from former slaves about how dried protein was boiled with vegetables as a flavouring. In addition, this planter’s remark about fresh meat suggests that most of this protein rationed was in fact preserved.

WPA respondents that mentioned fish were likewise referring mostly to herring.<sup>61</sup> When respondents elaborated what they had eaten as slaves, they revealed that these herring rations were almost always preserved. Ben Brown, in piedmont country, recounted having “a little meat an fish, not much,” and further elaborated about how he and the other slaves would soak and dry the salted herring to ensure that it “wont be so salty.”<sup>62</sup> Only “a little wuz given [to the slaves] with de other food.” In the tidewater region, smoked herring, or “red herring,” was more prevalent than salt herring. Dennis Sims, enslaved on a large tidewater slaveholding, described his daily diet as “bread, hominy, black strap molasses and a red herring a day,” and Rezin Williams observed that “mostly [slaves] ate red herring and molasses.”<sup>63</sup> A few WPA

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<sup>59</sup> See above, Chapter 3, for more on the provisioning of milk to slaves. For more on thoughts on the nutrition of milk, see Deborah M. Valenze, *Milk: A Local and Global History* (Yale University Press, 2011), 162-167.

<sup>60</sup> Breeden, *Advice Among Masters*, 94.

<sup>61</sup> AS:8:6-7, 62, 75; AS:12:11-12. *Weevils in the Wheat*, 7, 216. Also see John W. Blassingame, ed., *Slave Testimony: Two Centuries of Letters, Speeches, Interviews, and Autobiographies* (Baton Rouge: Louisiana State University Press, 1977), 133, 219; Jacobs, “Incidents in the Life of a Slave Girl,” 839.

<sup>62</sup> AS:12:11-12.

<sup>63</sup> AS:8:62, 75.

respondents reported rations or at least eating fish, but did not elaborate on what the species.<sup>64</sup> Lucy Brooks, who was enslaved in Maryland, mentioned eating fish, which she had her family “gets plenty...down on de bay.”<sup>65</sup> Her account suggests that her family were consuming saltwater fish.

Despite these references, mostly dated to the antebellum period, little archaeological evidence from eighteenth-century slave sites exists to support claims that slaves received herring specifically on at least an annual basis. Archaeologists have noted discrepancies between the historical and archaeological record when it comes to food consumption of pork belly or fatback, cuts of meat which are often boneless.<sup>66</sup> Stephen Atkins highlights a similar discrepancy when it comes to fish remains.<sup>67</sup> The majority of fish remains found and identified at slave sites in the cold south were freshwater fish or fish that spawn, live, and breed primarily in the rivers that carve through the piedmont. Fish elements found at slave sites at George Washington’s Mount Vernon plantation did not contain any species of herring, and yet Washington’s documents note weekly rations of salt herring and shad to his slaves and the location of Mount Vernon as “on one of the finest rivers in the world—a river well stocked with various kinds at all seasons of the year, and in the spring with shad, herring, bass, carp, sturgeon, etc. in great abundance.”<sup>68</sup>

In comparison, Diana Crader examined Thomas Jefferson’s *Farm Book*, which, among other things, recorded slave provisions, and found mentions of fish rations, but no detail on the

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<sup>64</sup> See the interview of Silas Jackson in AS:8:30, 33; John Smith in AS:11:2:272-273 Nan Stewart and Fleming Clark in AS:12:19, 22, 87; Chaney Richardson in AS:13:258; Lou Williams in AS:14:2:166; George Caulton in AS:SS1:3:172; Dempsey Pitts in AS:SS1:9:4:1711; Betty Foreman Chessier in AS:SS1:12:99; Henry Clay in Lindsay T. and Julie P. Baker, ed. *The WPA Oklahoma Slave Narratives* (Norman: University of Oklahoma Press, 1996), 81; Cornelius Garner, Beverly Jones, and Horace Muse in *Weevils in the Wheat*, 102-103, 181, 216.

<sup>65</sup> AS:8:3.

<sup>66</sup> Diana C. Crader, “Slave Diet at Monticello,” *American Antiquity* 55, no. 4 (1990): 699.

<sup>67</sup> Atkins, “African-American Slave Diet at Mount Vernon.”

<sup>68</sup> George Washington in McWilliams, “Shad Planking,” 203; Atkins, “African-American Slave Diet at Mount Vernon,” 64-70.



species and no schedule or amount for distribution.<sup>69</sup> Atkins—extrapolating on a quote from Jefferson in which he noted, “A barrel of fish costing \$7”—suggests that Jefferson was most likely referring to salt herring, given that the product was largely transported by barrels.<sup>70</sup> More importantly, Atkins emphasizes more than once the difficulty of tracing faunal evidence of herring at archaeological sites. Both Atlantic herring and American shad have small bones that are made even more fragile through the curing process. As a result, these bones can be consumed unaware, leaving little evidence for the archaeological record. Furthermore, the fragile nature of these bones means they are subject to quick degradation if disposed in an area that had had, recently or otherwise, high traffic.<sup>71</sup>

That herring degrades quickly, and that the historical record contains so many mentions of herring, does not account for the percentage of freshwater fish that make up the fish remains in slave sites across the United States. Freshwater fish comprises on average 5 to 7 percent of animal remains on Virginia and Maryland slave sites.<sup>72</sup> This average is significant but low in comparison to the other sources of animal protein. However, the low percentage is understandable when one considers the fishing season, which along the cold coast was typically from spring to early fall. Their time was most constrained during this period, the growing season. Still, slaves fished in the creeks and rivers that fed and flowed from the Chesapeake Bay. Certain species migrated upstream in the spring to spawn, such as the herring family and sturgeon, the bones of which were found at a few slave sites.<sup>73</sup> In the piedmont region, slaves fished according to season, in the spring and summer. The prevalence of both enough fish and fish large enough to

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<sup>69</sup> Crader, “Slave Diet at Monticello,” 703.

<sup>70</sup> Jefferson quoted in Atkins, “African-American Slave Diet at Mount Vernon,” 27.

<sup>71</sup> *Ibid.*, 23-24.

<sup>72</sup> Morgan, *Slave Counterpoint*, 139-140. Freshwater catfish makes up the largest percentage of fish elements identified at Mount Vernon. Atkins, “African-American Slave Diet at Mount Vernon,” 47.

<sup>73</sup> Sturgeon was identified at a slave cabin at Mount Vernon. Atkins, “African-American Slave Diet at Mount Vernon,” 32.

eat, and with the skeletons to withstand the erosion of time and place, would have been restricted to the warmer months. As such, when WPA respondents discussed fishing as young, enslaved children, they discussed the activity alongside swimming, a warm-weather activity.<sup>74</sup> That is not to say that slaves did not fish all year round, but that slaves likely consumed the fish they caught in the warmest months. As the harvest season drew near, slaves would not have the time, or more importantly the energy, to travel somewhere and spend a few hours fishing.<sup>75</sup>

Bioarchaeological evidence from the piedmont region suggests that slaves there at least were too preoccupied for recreational or supplementary fishing to be a significant part of their diet. Archaeologist Sophia Dent, analyzing the remains of an African-American cemetery in Warren County, North Carolina, suggested that nearby slaves would have consumed more saltwater fish and land animals than freshwater fish. The protein makeup of the skeletons suggested that freshwater fish from the nearby river had not contributed significantly to the diet of the enslaved buried there.<sup>76</sup> Four of the buried expressed large amounts of the protein values that associated with fish consumption, but these values are related to animals that feed in marine, meaning near or in the ocean, or terrestrial environments.<sup>77</sup> River herring and shad are species of herring that spend most of their existence in a marine environment, rather than rivers, swimming upriver to spawn during the spring.<sup>78</sup> Though a conclusion cannot be definitively made from Dent's analysis, what it suggests is that these slaves were eating at least a certain quantity of fish.

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<sup>74</sup> AS:11:1:75; AS:11:2:73, 139, 208.

<sup>75</sup> Stephen Atkins tracked a similar change over time through the disposal of fish elements at Mount Vernon. The remains of freshwater catfish featured largely during one time period while herring remains dominated during other periods, illustrating, perhaps, seasonal change or a temporary change in economic status. Atkins, "African-American Slave Diet at Mount Vernon," 75-77.

<sup>76</sup> Sophia C. Dent, "Interindividual differences in embodied marginalization," *American Journal of Human Biology* 29, no. 4 (2017): 9.

<sup>77</sup> Dent, "Interindividual differences in embodied marginalization," 9.

<sup>78</sup> Joseph E. Hightower, Anton M. Wicker and Keith M. Endres, "Historical Trends in Abundance of American Shad and River Herring in Albemarle Sound, North Carolina," *North American Journal of Fisheries Management* 16, no. 2 (1996): 257-271.

If the protein values for fish cannot be linked to freshwater fish, the most likely source of this protein was herring. The question remains how much. Oral testimony can assist in teasing out how substantial these rations were.

As a result of geography, and long-established settlement, slaves in the tidewater region received herring rations more regularly than those enslaved in the piedmont. If they did not receive at least one whole or one-half herring daily all year round, as per Charles Ball's narrative, slaves were at least rationed this amount from the beginning of the fishing season to the end of it in the fall. At his plantation, George Washington rationed salt herring and shad on at least a weekly basis.<sup>79</sup> His main plantation, Mount Vernon, was in a particularly advantageous position along the Potomac River. Mount Vernon sits at a narrow bend of the Potomac River, which feeds into the Chesapeake Bay. Though Washington had many fisheries, including along other tributaries to the Potomac, Vernon was built along this narrow neck of the Potomac. Each spring several species of saltwater fish, such as the herring and shad listed in Washington's documents, swim up the Potomac River to spawn. This predictable movement makes fishing as simple as lowering a net or seine into a narrow bend in the river. Two WPA respondents recounted life on slaveholdings just across the Potomac in Prince Georges County, Maryland. Dennis Sims and Rezin Williams noted that the protein rations for slaves in this tidewater county stood at one herring a day.<sup>80</sup>

South of the Potomac, another WPA respondent, who was enslaved and sold in Richmond County, Virginia, was also rationed salt herring by two separate slaveholders. Horace Muse recalled with distaste one miserly slaveholder, who distributed daily just "a ash cake an' half a herrin' an' water." Muse contextualized this miserliness, describing how "when I was at de

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<sup>79</sup> Atkins, "African-American Slave Diet at Mount Vernon," 64; Covey and Eisnach, *What the Slaves Ate*, 130-131.

<sup>80</sup> AS:8:60, 72.

Masons, dey feed us good. Dey give us a pint o' milk, a whole herrin' an' a ash cake too.”<sup>81</sup> The Masons' generosity is highlighted by not just increasing the half herring to a whole, but also by the addition of milk, which has substantially higher calories than a single salt herring.<sup>82</sup>

Richmond County lies within a peninsula bordering the Chesapeake Bay known as the Northern Neck of Virginia. The Potomac flanks the north of the county, and the Rappahannock River, one of the major main stem rivers that flows into the bay, borders the south. Like the advantageous position of Mount Vernon, the northernmost tip of Richmond County ends once the Rappahannock narrows and remains so for several miles. Muse's slaveholdings could have been located anywhere along the coast of the river, but even if they were slaveholdings without access to any water, both of his slaveholders took advantage of the product that sprung from Richmond County's geographical position.

Salt herring even found its way to the mountain country along the West Virginia border, highlighting how slaveholders made use of the herring and shad fisheries located downstream and how the preserved herring market did not need to extend beyond the cold south for slaveholders to reap its profits. Madison Jefferson, a slave who fled to Canada and then to England, described how herring made up the bulk of the weekly protein rations on the mountain region slaveholding from which she fled: “They provisions consisted of from two to three herrings, with corn bread and milk at times, and during long summer days they would sometimes get about a quarter of a pound of bacon—on the whole, the allowance was very scanty.”<sup>83</sup> Jefferson's herring rations amounted to around a third of a whole herring a day. The terrain in mountain country may have made it more difficult for Jefferson's slaveholder to raise

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<sup>81</sup> *Weevils in the Wheat*, 216.

<sup>82</sup> Muse was likely referring to butter milk, and not whole or even skimmed milk. See also Chapter 1.

<sup>83</sup> Blassingame, *Slave Testimony*, 219.

livestock—leaving the slaveholder reliant on purchasing provisions, rather than the self-sufficiency described in other accounts. The addition of bacon in the summer suggests that a third of herring a day was not sufficient for the harvest season, which was, in most cases, the most laborious season in the cold south. Likewise, during the harvest season, John Tayloe III, a wealthy planter near Richmond, Virginia, provisioned his slaves with extra rations of pork, beef, and herring.<sup>84</sup> This seasonal provisioning also demonstrates that these fugitive and former slaves would not have had the time by early to late summer to supplement their rations. A similar pattern can be seen upstream in the piedmont.

Away from the coastal line, taking into consideration Dent's analysis, piedmont slaves likely received salt herring on a less consistent basis compared to their tidewater counterparts. The absence of major tributary rivers near the Virginia-North Carolina border line left slaves there with less, exacerbating differences in provisioning between small and large slaveholdings. In northern Virginia, Ben Brown spoke of only "a little" salt herring in his rations accompanied by just as little meat. Soaked and dried before consumption, a process similar for those who cook salt cod, salt herring in these amounts were used as a flavouring to stews. Brown was enslaved in Albemarle County, an area which covers the piedmont plateau at the very foot of the Blue Ridge Mountains.

Monticello, Thomas Jefferson's primary plantation, was also located in Albemarle County. At Monticello, slaves were rationed between four to eight pounds of fish.<sup>85</sup> Brown categorized the plantation on which he was enslaved as "very large" and described the slave quarters as a small town, with a row of houses facing one another like the road of a town. A

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<sup>84</sup> Richard S. Dunn, *A Tale of Two Plantations: Slave Life and Labor in Jamaica and Virginia* (Cambridge, MA.: Harvard University Press, 2014), 192.

<sup>85</sup> Yentsch, *A Chesapeake Family*, 212. See Atkins above regarding the likelihood of this fish being salt herring.

population number of anywhere from thirty to one hundred slaves can fit this description.<sup>86</sup> In contrast, Monticello held 200 slaves.<sup>87</sup> Though the older slave states had many established slaveholdings with many slaves, 200 is not representative of large cold-south slaveholdings. Rather than take the rations of Monticello, or even Mount Vernon, and generalize it to the slave population on large slaveholdings, Ben Brown's account is probably more familiar, even to individuals enslaved on smaller slaveholdings.

Brown implied the meagreness of rations in his description of using what little protein was given—not unlike how enslaved West Africans, in their forced migration, seasoned the provisioned starch with bits of dried fish. But another account described the inverse, recounting how a herring alone was insubstantial. WPA respondent Lillian Clarke recalled a story that another enslaved woman, whom she called “Ole A’nt Cinda,” had told her. Cinda’s previous slaveholder had fed her only one salt herring a day and, Clarke emphasized, “No, [the slaveholder] ain’t give not bread wid hit. She had eat dat or nothing.”<sup>88</sup> Clarke was enslaved in a geographic spillover area, like Albemarle, Hanover County. Hanover lies along the Fall Line where the coastal plains begin to rise and where the rivers lower and increase in salinity. Cinda’s slaveholder may have employed slaves as fishermen, but, given that they rationed only salted herring, it is more likely that they were not a self-sufficient slaveholding, and rather a small farm. For James Curry, who fled a slaveholding in piedmont North Carolina, when there was not enough of the slaveholder’s leftover meat to go around, slaves would have “one herring apiece.”<sup>89</sup> Both Clarke and Curry’s stories, along with Horace Muse’s above, highlight the

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<sup>86</sup> Robert William Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: W.W. Norton & Company, 1989), 169.

<sup>87</sup> Cynthia A. Kierner, *Martha Jefferson Randolph, Daughter of Monticello: Her Life and Times* (Chapel Hill: University of North Carolina Press, 2012), 191.

<sup>88</sup> *Weevils in the Wheat*, 72.

<sup>89</sup> Blassingame, *Slave Testimony*, 133.

caloric inadequacy of preserved herring, even when rationed whole. Herring was not substantial enough to serve as its own meal nor did contemporary slaveholders themselves regard that as a complete meal. However, consistent herring rations would have increased vitamin D levels in the blood of enslaved children significantly as the days wore into the autumn.

If slaves were supplied at least one herring a day annually, and a whole herring amounted to, by conservative estimate, 165 IUs, this would have increased serum levels of vitamin D. But to make this estimate realistic and more generalizable, suppose that most slaves in the tidewater and piedmont received herring rations from July until October. This consumption would have maintained circulating vitamin D levels or at least tapered off its decline. As a result, this circulation, and utilization by the body, would continue until at least November in most healthy individuals.

But not all slaves on the slaveholding could access supplementary rations. Supplementary rations were distributed to slaves in the harvest season when the typical day-to-day workload increased.<sup>90</sup> Enslaved children, despite performing a myriad of tasks around the slaveholding, did not fall under this category. Thus, enslaved children generally did not receive these supplementary rations and did not reap this boost of dietary vitamin D to carry them through to the slaughter season. For the enslaved teenagers who had begun to receive these supplementary rations, a whole preserved herring amounted to the modern-day equivalent of half a teaspoon of cod liver oil.<sup>91</sup> The result of this supplementation would have allowed enslaved children to prolong vitamin D levels. An observational study of fair-skinned children in autumnal Iceland saw a decline in blood serum levels of vitamin D from September to November, but children who supplemented with vitamin D had a more gradual decline compared to children who did not

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<sup>90</sup> See note 82 and 83.

<sup>91</sup> Cod liver oil is a popular method of vitamin D supplementation and ranges between 300 to 400 IU per teaspoon.

supplement.<sup>92</sup> The children of this study were aged seven to nine, demonstrating that similar supplementation, like the addition of a whole herring, may have decreased the likelihood of rickets in enslaved children.

Children and adolescents received less of these meat rations on large slaveholdings, but determining the quantity consumed on farms and other smaller slaveholdings is more difficult. Harriet Jacobs, who was enslaved on a large slaveholding in North Carolina, noted how the weekly rations were categorized by age, with men receiving the most meat and herring. Elderly slaves received little, but “children over twelve” received three quarters of a pound of meat, a half peck of corn, and six whole fillets of preserved herring.<sup>93</sup> Though seemingly generous for children, these children were at the cusp of adolescence, or they were teenagers themselves, that were now doing hard labour and qualified for an increase in rations.<sup>94</sup> A Virginia planter described how he provisioned his slaves by age and position. When outlining the provisions for domestic slaves: “To each man and boy, two pounds bacon and one peck corn meal. To each woman and girl, two pounds bacon and one peck corn meal. To each child over two years and under ten years, one pound bacon, and half a peck of corn meal.”<sup>95</sup> Like much planter advice in magazines, these amounts describe an ideal, not necessarily a reality. Further investigation of the diets of enslaved children reveal that most did not receive sufficient rations.<sup>96</sup>

Given the high prevalence of rickets among enslaved children, and other diseases in which vitamin D deficiency was a contributing cause, enslaved children were not consuming any

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<sup>92</sup> Adda Bjarnadottir et al., “Insufficient autumn vitamin D intake and low vitamin D status in 7-year-old Icelandic children,” *Public Health Nutrition* 18, no. 2 (2015): 211.

<sup>93</sup> Jacobs, *Life of a Slave Girl*, 839.

<sup>94</sup> Wilma King, *Stolen Childhood: Slave Youth in Nineteenth-Century America*, 2nd ed. (Bloomington: Indiana University Press, 2011), 73-77; Morgan, *Slave Counterpoint*, 197-198.

<sup>95</sup> Breedan, *Advice Among Masters*, 103.

<sup>96</sup> King, *Stolen Childhood*, 95; Kenneth F. Kiple and Virginia Himmelsteib King, *Another Dimension to the Black Diaspora: Diet, Disease and Racism* (Cambridge: Cambridge University Press, 1981), 97-98.



form of preserved herring as regularly as enslaved teenagers. Charles Ball's narrative gives clues as to how children under twelve were generally rationed on large slaveholdings and whether they accessed salt herring rations. Ball rhapsodized about his mother, describing how she "often divided the scanty pittance of food allowed her by her mistress, between my brothers, and sisters, and me, and gone supperless to bed herself. Whatever victuals she could obtain beyond the coarse food, salt fish, and cornbread, allowed to slaves on the Patuxent and Potomac rivers, she carefully distributed among her children, and treated us with all the tenderness which her own miserable condition would permit."<sup>97</sup>

Most enslaved children consumed milk and bread, even as slaveholders expected them to assist their parents and kin. It is not surprising then that Ball's mother sacrificed her meals to bulk up those of her children's. But the salt fish that Ball's mother received was not enough to divide among several hungry children. For enslaved children to have reached a certain level of height and exceeded it year after year, they had to be consuming, at even a later age, additional rations. Thomas Jones, the Black reverend whose account of a bitterly cold January day opened my first chapter, recalled eating fish as a child. But he was also nine years old—old enough to be sold off as an individual slave. Though the ages at which enslaved children were considered part of the adult workforce varied between nine and ten years of age in the U.S. South, the consequences were the same.

Enslaved adolescents had access to preserved herring because of their entry into the workforce. Enslaved children did run tasks and work, but they were not expected to perform at the same rate as adults, and thus, they were rationed less than adults—even as these growing

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<sup>97</sup> Ball, *Slavery in the United States*, 18. In some cases in South Carolina, the diet of enslaved children was closely controlled for "wholesomeness." Anne Yentsch, "Excavating the South's African American Food History," in *African American Foodways: Explorations of History & Culture*, edited by Anne L. Bower (Urbana, IL.: University of Illinois, 2009), 63fn12.

children needed rations the most. The sudden increase in rations during adolescence blunted the impact of a sudden increase in labour. In the cold south, provisions of herring during some of the more arduous work contributed to the catch-up growth experienced by enslaved adolescents.

## CHAPTER 5 FOR JUST A CENTIMETRE MORE

In the late eighteenth century, many slaves coming out of the winter season and into the spring fell ill. As the spring season emerged in 1770, Landon Carter, an eighteenth-century Virginian planter, noted in his diary a pattern of ill health among the enslaved.<sup>1</sup> This decline in health was attributed to the weather, but the major factor was likely that many cold-south slaves experienced a sudden increase in labour as soon as warm weather broke the sheet of ice covering the river and the earth warmed the snow clear off the ground. Such moments appeared earlier and earlier by the end of eighteenth century. We can trace the impact of this extended growing season and consequent increase in labour as a function of a decrease in the average height of the enslaved male population in Virginia from 1790 to 1810.<sup>2</sup> But this measure of health changed in the early nineteenth century.

From 1815 to 1835, the average height of enslaved Virginian men increased steadily. The most profound difference between the late-eighteenth-century Virginians and those born in 1805 and beyond was climate. A period of global cooling occurred from 1810 to 1820, typically attributed as the cold decade, or as historian Gillen Wood termed, the volcanic decade.<sup>3</sup> This cooling period pushed spring into March, in contrast to the spring experienced in February by Virginians such as Landon Carter. Suddenly, the same foods that enslaved children in the first decade of the nineteenth century had consumed were sufficient for their health. The most important food in the spring was fish, and specifically oily fish, that would contain enough

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<sup>1</sup> Landon Carter, *The Diary of Colonel Landon Carter of Sabine Hall, 1752-1778*, ed. Jack P. Greene, Vol. 1 (Charlottesville, VA.: University Press of Virginia, 1965), 369.

<sup>2</sup> Howard Bodenhorn, "A Troublesome Caste: Height and Nutrition of Antebellum Virginia's Rural Free Blacks," *Journal of Economic History* 59, no. 4 (1999): 983, table 2.

<sup>3</sup> Wolfgang Behringer, *Tambora and the Year without a Summer: How a Volcano Plunged the World into Crisis*, trans. Pamela Selwyn (Cambridge: Polity Press, 2019), 20-21; Brian Fagan, *The Little Ice Age: How Climate made History, 1300-1850* (New York: Basic Books, 2000), 170; Gillen D'Arcy Wood, *Tambora: The Eruption that Changed the World* (Princeton, NJ.: Princeton University Press, 2014), 36-41.

vitamin D. The bitter winters would prevent slaves from spending too much time outdoors, intensifying the importance that children find supplementation in other forms.

For enslaved people living in the cold south in the early nineteenth century, the cold decade did not portend how the domestic slave trade would expand in subsequent decades. Their growing seasons shortened in the 1810s. Enslaved adolescents and children in the first half of the cold decade could rest longer than the previous generations. This rest, coupled with sufficient rations, increased the height average of enslaved Virginian men beginning in 1815. Even as drought, famine, and war struck the rest of the world, and the average height of southern American and western European men declined, these enslaved men had to grapple with the fact that one health indicator of their generation seemed to have improved on the generation previous.

But how did these slaves reach these heights? As enslaved children, they had to have enough food to eat, enough rest to recover, and enough vitamin D to support a growing skeleton. As darker-skinned individuals living at a latitude where they could not gain vitamin D from the sun four to five months out of the year, slaves had to turn to dietary sources for supplementation. Vitamin D was crucial for this growth because it promotes bone growth and maintenance, but the hormone assists indirectly, without synthesizing calcium or phosphorous. Without the existence of these minerals in the body to begin with, vitamin D cannot perform its homeostatic function on them. In terms of bone health, vitamin D functions well in the presence of calcium, phosphorous, and magnesium—minerals best sourced from the diet and minerals that appeared in sufficient levels in the slave diet.<sup>4</sup>

One recent study attempted a statistical analysis of the potential effect of vitamin D on the stature of Black American men in the mid to late nineteenth century. Scott Alan Carson

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<sup>4</sup> Kenneth F. Kiple and Virginia Himmelsteib King, *Another Dimension to the Black Diaspora: Diet, Disease and Racism* (Cambridge: Cambridge University Press, 1981), 92-93.

deviated from previous studies of slave height by using heights from prison populations.<sup>5</sup> His data revealed an association between the prevalence of sunlight at a certain latitude and the stature of enslaved men, with an even more robust significant effect on enslaved men with darker complexions.<sup>6</sup> In other words, if enslaved prisoners were raised in areas that received more sunlight, they had a height advantage on enslaved prisoners located in areas that received less sunlight. Keeping in mind the context in which these enslaved men had likely been born, Carson accounted for the domestic slave trade by controlling the data for migration.<sup>7</sup> Migration from central states, such as Virginia, West Virginia, and Maryland, to southern states, such as Alabama, Arkansas, Louisiana, and Mississippi—a region I would classify as the warm south—had a significant effect on stature. If white and enslaved men left these central states for southern states, they were more likely to be taller than if they had been born in the warm south.<sup>8</sup>

Carson's data and interpretation suggests that leaving the cold south increased the likelihood that enslaved adolescents reached their adult terminal height.<sup>9</sup> But these enslaved adolescents raised in the cold south also likely had a better baseline health when they arrived in the warm south.<sup>10</sup> Carson's results also suggest that the environmental conditions that initiated the Virginia increase in the 1810s created a lingering effect on the health of men born into enslavement in the cold south. Whatever the differences in the conditions of enslavement above

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<sup>5</sup> Scott Alan Carson, "Institutional Change and Variation in 19th-century Southern Blacks' and Whites' Body Mass Indices," *Journal of Institutional and Theoretical Economics* 170 (2014): 296-316.

<sup>6</sup> Carson, "Insolation in Nineteenth Century African-American Statures," 745.

<sup>7</sup> *Ibid.*, 744fn9.

<sup>8</sup> *Ibid.*, 747, table 2.

<sup>9</sup> However, though Carson was able to statistically demonstrate a regional difference in slave health, the study's sampling left out two major states. His samples did not include prisons from Maryland or Virginia, two of the three states this thesis focuses on. *Ibid.*, 739.

<sup>10</sup> Further bolstering this observation is Scott Alan Carson's calculation that body mass index (BMI) of black men decreased by 2% between 1840 and 1860. Because body mass index considers weight and height, it is possible that the height increase in this period may be related to Carson's observation of a decrease in overall black male BMI. Carson, Scott Alan. "Institutional Change and Variation in 19th-Century Southern Blacks' and Whites' Body Mass Indices." *Journal of Institutional and Theoretical Economics* 170, no. 2 (2014): 309.

and below the thirty-ninth parallel, their effects persisted through the expansion of the slave trade in the 1830s, around which time average heights began to decline once more.

These results also assist in contextualizing other slave height findings, which suggest that a similar increase in height over 1815 to 1835 occurred in other U.S. slave populations. In 1979, Richard Steckel investigated slave height using coastwise manifests.<sup>11</sup> As the domestic slave trade took hold in the U.S. following the American Revolution, those who trafficked enslaved African-Americans by sea tracked a number of their physical characteristics.<sup>12</sup> Steckel used this data to better understand the net nutritional status of slaves. His profile of heights across the nineteenth century reinforces Howard Bodenhorn's later findings on the Virginia increase. Enslaved men experienced an increase in height over the 1810s and into the 1830s.<sup>13</sup> Even with the statistical noise, as enslaved people from South Carolina, Alabama, and Louisiana were included, the Virginia increase is significant enough an anomaly to increase the average height of all slaves in the early nineteenth century. But by the 1830s, this height advantage began to disappear, as the average height of enslaved people declined.

In the first decade of the nineteenth century, western trade policies laid the groundwork for the economic reverberations that occurred in the 1810s. Tensions between Britain, Napoleon's France, and Thomas Jefferson's U.S. articulated in a number of embargoes through the last half of the 1800s.<sup>14</sup> Jefferson, retaliating against Napoleon's protectionist 1806 embargo, blocked trade from even leaving American ports until the day he left office, March 4, 1809.<sup>15</sup> Agriculturalist slaveholders and urban merchants in the cold south relied on the overseas trade to

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<sup>11</sup> Richard Steckel, "Slave Mortality: Analysis of Evidence from Plantation Records." *Social Science History* 3, no. 3 (1979):

<sup>12</sup> Steckel, "Slave Height," 364.

<sup>13</sup> *Ibid.*, 377, fig.3.

<sup>14</sup> Donald Hickey, *The War of 1812: A Forgotten Conflict* (Urbana, IL.: University of Illinois Press, 1989) ch. 2.

<sup>15</sup> W. Freeman Galpin, "The Grain Trade of Alexandria, Virginia, 1801-1815," *The North Carolina Historical Review* 4, no. 4 (1927): 414-415.

generate their wealth. For those who grew the crops, they could rely upon domestic trade to a degree. However, it is suggestive that Jefferson lifted the embargo on March 4, as he left office deep in debt from his spending habits during his long presidency.<sup>16</sup>

The European and American embargoes destabilized an already unstable market in grain in Europe. But the climatic events of 1809, and the subsequent decade, exacerbated the market. Grain prices, particularly of flour and wheat, skyrocketed. Cold-south agriculturalists profited in a market in which the product grew best in their climate beset by drought. In contrast, cold and wet weather plagued Europe even through the summer months. Contemporaries fascinated with weather, at the time, did not connect these odd, and later predictable, events with volcanic eruptions. Climate scientists and historians have suggested that multiple eruptions in the 1810s were responsible for covering the world in a cloak of ash particles that lengthened winters and triggered dramatic climatic events.<sup>17</sup> The eruptions that characterized the cold decade were not solely responsible for the economic and social consequences that shaped the lives of slaves in the cold south. But they played a significant role in transforming the work schedules of cold-south slaves.

The health of cold-south slaves, however, was a matter of less global consequence and more of environmental circumstance. Slaveholders provisioned items, such as milk and herring, that were specific to the environmental conditions of the cold south region. I have spent most of this thesis discussing the ways in which external actors and events bettered the health of enslaved African-Americans by force. But slaves also worked to better their own health, and, especially, the health of their children. The long winters of the cold decade allowed enslaved parents to

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<sup>16</sup> Steven Harold Hochman, "Thomas Jefferson: A Personal Financial Biography," PhD diss., (University of Virginia, 1987), 273.

<sup>17</sup> Fagan, *The Little Ice Age*, 169; Behringer, *Tambora and the Year without a Summer*, 20-21. Wood, *Tambora: The Eruption that Changed the World*, 33-37.

spend more time fishing as well as hunting. With late frosts threatening plants through April and into May, slaveholders were themselves forced to idle at a time when slaves would typically begin replanting. As such, parents could spend more time supplementing the diet of their children. On slaveholdings such as the one in which Thomas Jones was enslaved, where enslaved children under ten were not even provisioned, these additional provisions were all the more important.

During the Middle Passage, parents as well as other adults would have taken responsibility for the diet of enslaved children in the same way. For example, on one seventeenth-century Dutch slave ship, the weekly ration for a captive man was two and a half pounds of meat and one and a half pounds of dried fish.<sup>18</sup> Given that the instructions specify these rations as “for One Man,” slave traders were likely not considering the needs of children and given that children under twelve made up at least one-fifth of the captive imports into Virginia, someone had clearly been taking care of the children throughout the journey.<sup>19</sup> Colonial-era Virginia slaveholders preferred adolescents, or teenagers between the age of twelve to eighteen. Virginia slaveholders, and others across the South, displayed a similar pattern of ignoring enslaved children until they appeared strong enough to contribute to the plantation economy. The consequence of this preference was an undernourished population of enslaved children. The enslaved parents of these children took on the task to provide where the slaveholder chose not, supplementing their diet through fishing, hunting, and foraging. Another, perhaps intended, consequence of selective provisioning was the increase in slave male height.

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<sup>18</sup> Herbert C. Covey and Dwight Eishach, *What the Slaves Ate: Recollections of African American Foods and Foodways from the Slave Narratives* (Santa Barbara, CA.: Greenwood Press, 2009), 48.

<sup>19</sup> Morgan, *Slave Counterpoint*, 70-73.



This thesis has focused largely on explaining a phenomenon representative of the experience of enslaved men. The Virginia increase was a uniquely male phenomenon. Enslaved women did not see a similar boost in health. Steckel’s coastwise manifest data demonstrates that enslaved women across the slaveholding U.S. saw stagnant height averages between 1815 and 1835 (see fig. 4b). Howard Bodenhorn’s data on Virginian women suggests that enslaved women were taller in the late eighteenth-century, holding a 0.4 cm average advantage over enslaved women who reached adulthood from 1790 to 1840 (see table 3).

However, in respect to biological female health, reproductive health is a more reliable indication of overall health in women. It is difficult to interpret data solely on height because enslaved women could have reached taller heights while also experiencing delayed menstruation and infertility. Historians have speculated that most enslaved women in the antebellum period began to menstruate at the age of fourteen to sixteen.<sup>20</sup> The modern-day standard is lower, at ten

Table 3      The Virginia increase: The height averages of enslaved and freeborn women in Virginia from 1765 to 1835.

<b>Birth Cohort Centered on Year</b>	<b>Stature of free-born in inches</b>	<b>Stature of slave-born in inches</b>
1765	-	62.3
1775	62.6	62.9
1785	63.2	62.6
1795	63.2	63.4
1805	63.1	63.0
1815	63.1	63.0
1825	63.0	62.9
1835	62.3	62.0

<sup>20</sup> Robert William Fogel, *Without Consent or Contract: The Rise and Fall of American Slavery* (New York: W. W. Norton & Company, 1989), 134.

Sources: Data taken from Howard Bodenhorn, "A Troublesome Caste: Height and nutrition of Antebellum Virginia's Rural Free Blacks," *Journal of Economic History* 59, no. 4 (1999): 983.

to thirteen.

One method of parsing the status of female reproductive health from historical sources is to track birth rates and the lengths of time between children, as Richard Fogel and Richard Dunn have done in their work.<sup>21</sup> Enslaved women were not given months off their work to nurse their newborn infants. In the antebellum era, these women were expected to nurse for at most three weeks before returning to their typical work schedule.<sup>22</sup> Because nursing often prevents pregnancy, early modern women who stop or begin intermittently nursing could no longer rely on this natural birth control and often became pregnant soon after giving birth. But just as height requires a certain baseline of health, so too does pregnancy. Tracking the ebb and flow of birth rates for enslaved women in the nineteenth century can reveal this baseline. Investigating these ebbs and flows can also shed light on the ways in which the enslaved modulated their own health for the better and even for the worse. But, of course, this is beyond the scope of this thesis.

The survival strategies of enslaved African-Americans led to an increase in their health—or at least, an increase in a measurable factor of their physical health. How do we reconcile the fact that for someone enslaved the act of living itself, particularly prolonging the life of their very children, was ultimately a source of profit for the slaveholder? This paradox highlights how difficult it is to grasp what it means to be enslaved by focusing on material conditions, such as

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<sup>21</sup> Richard S. Dunn, *A Tale of Two Plantations: Slave Life and Labor in Jamaica and Virginia* (Cambridge, MA.: Harvard University Press, 2014), 150-169; Fogel, *Without Consent or Contract*, 147-149.

<sup>22</sup> Eustace Hodges in AS:11:1:447; Ophelia Whitley in AS:11:2:373. Wilma King, *Stolen Childhood: Slave Youth in Nineteenth-Century America*, 2<sup>nd</sup> ed. (Bloomington: Indiana University Press, 2011), 62. Deborah Gray White suggests two to three weeks of "light work" followed delivery. Deborah Gray White, *Ar'n't I A Woman?: Female Slaves in the Plantation South* (W. W. North & Company, 1985), 112.

food, housing, and even physical punishment. It is ethical quandaries such as these that truly characterized enslavement in the antebellum U.S.

In the 1980s, Richard Steckel's work on slave health sought to understand how Black people fared in the Reconstruction era. In these earlier decades, nutrition science was concerned with the issue of malnutrition. In the 1990s, the issue of the obesity crisis engulfed the imagination of scientists working in nutrition and general physiology, as well as the media, just as scholarship on the history of African-American cuisine burgeoned. Through the 2000s, culinary historians became as interested in tracing back the history of African-American cuisine as they are in understanding the alleged obesity crisis in the Black American population. While most avoided pointing the finger directly, applications of these histories to modern-day life were accompanied by recommendations not to consume the cuisine's staples *ad libitum*.<sup>23</sup> It is the fat, one would cry. It is the calories, lack of colorful vegetables, or general absence of movement pointed another.<sup>24</sup> Others still drew up conclusions about the overall health of these communities and their food with little evidence.<sup>25</sup> Thankfully, the trend in these histories seems to have shifted away from these unsolicited observations and recommendations.<sup>26</sup>

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<sup>23</sup> One of the exceptions being the many cookbooks dedicated to preserving recipes. See also Andrew Warnes' exploration of the origins of the term, "barbecue," barbecue's racialized association with barbarity, and its more modern-day association with "acute commercialization and sheer unhealthiness." Andrew Warnes, *Savage Barbecue: Race, Culture, and the Invention of America's First Food* (Athens, GA.: University of Georgia Press, 2008), ch. 3.

<sup>24</sup> See historian Adrian Miller's frequent remarks about the health reasons to avoid food: "I'd eat some version of barbecue every day if it weren't for some predictable health consequences," or "I have a slight attitude toward white bread mainly for health"—despite having just reasoned that white bread is used for sandwiches on barbecue plates because of its "soaking ability, lack of crumbling, and ability to still taste kind of good." Adrian Miller, *Black Smoke: African Americans and the United States of Barbecue* (Chapel Hill: University of North Carolina Press, 2021), 3, 160.

<sup>25</sup> Harris, *High on the Hog*, 227; Frederick Douglass Opie, *Hog and Hominy: Soul Food from Africa to America* (New York: Columbia University Press, 2008), 29, 33.

<sup>26</sup> See Michael W. Twitty, *The Cooking Gene: A Journey Through African American Culinary History in the Old South* (New York: HarperCollins, 2017); Kelley Fanto Deetz, *Bound to the Fire: How Virginia's Enslaved Cooks Helped to Invent American Cuisine* (Lexington, KY.: University of Kentucky Press, 2017); See also Jennifer Wallah's epilogue for a historiographical discussion on the cuisine. Jennifer Jensen Wallah, *Getting What We Need Ourselves: How Food has Shaped African American Life* (Lanham, MD.: Rowman & Littlefield, 2019), 147-158.

My goal here is not to trace the origins of foods that are “better” than the holy trinity, and other staples, that make up African-American cuisine, as well as soul food. Rather, I hope that this study reveals the fallacies in searching for historical evidence that macronutrients and the degree of physical exertion alone dictate health. As I hope I have shown, rest, recovery and access to micronutrients are just as significant. Even as slaves had the nutritional building blocks and intensity of physical activity in the first decade of the nineteenth century that many today lack, a shift in the global climate was necessary to initiate the social and economic changes that drove a height increase across generations.

As our world continues to warm, and extreme weather events become frequent and commonplace, it is increasingly important that we consider health in the context of climate and the environment. With that context in mind, then, a little cornbread, ham, and molasses never hurt nobody.

## BIBLIOGRAPHY

### Primary Sources

- Andrews, William L., and Henry Louis Gates Jr. eds. *Slave Narratives*. New York: Library of America, 2000.
- Baker, Lindsay T. and Julie P. Baker, ed. *The WPA Oklahoma Slave Narratives*. Norman: University of Oklahoma Press, 1996.
- Ball, Charles. *Slavery in the United States. A Narrative of the Life and Adventures of Charles Ball, a Black Man, Who Lived Forty Years in Maryland, South Carolina and Georgia, as a Slave Under Various Masters, and was One Year in the Navy with Commodore Barney, During the Late War*. New York: Brick Church Chapel, 1837.
- Blassingame, John. *The Slave Community: Plantation Life in the Antebellum South*. New York: Oxford University Press, 1972.
- Breeden, James, ed. *Advice Among Masters: The Ideal in Slave Management in the Old South*. Westport, Conn.: Greenwood Press, 1980.
- Corry, Joseph. *Observations upon the Windward coast of Africa: the religion, character, customs, &c. of the natives with a system upon which they may be civilized and a knowledge attained of the interior of this extraordinary quarter of the globe and upon the natural and commercial resources of the country made in the years 1805 and 1806*. London: Frank Cass & Co. Ltd, 1968.
- Fordham, Elias Pym. *Personal Narrative of Travels in Virginia, Maryland, Pennsylvania, Ohio, Indiana, Kentucky; and of a Residence in the Illinois Territory: 1817-1818*. Edited by Frederic Austin Ogg. Cleveland, OH.: Arthur H. Clark Company, 1906.
- Hawkins, Joseph. *A Voyage to the Coast of Africa, and Travels into the Interior of That Country; Containing Particular Descriptions of the Climate and Inhabitants, and Interesting Particulars concerning the Slave Trade*. New York: Luther Pratt, 1797.
- Library of America, *Slave Narratives*. New York: Library of America, 2000.
- Park, Mungo. *Travels in the Interior Districts of Africa: performed under the direction and patronage of the African Association, in the years 1795, 1796, and 1797*. 4th ed. London: W. Bulmer and Co., 1800.
- Perdue Jr., Charles L., Thomas E. Barden, and Robert K. Phillips, eds. *Weevils in the Wheat: Interviews with Virginia Ex-Slaves*, 2nd ed. Charlottesville: University of Virginia Press, 1994.

Rawick, George, ed. *The American Slave: A Composite Autobiography*. Westport, Conn.: Greenwood Pub., 1972.

Rawick, George, ed. *The American Slave: A Composite Autobiography*, Supplement Series 1. Westport, Conn.: Greenwood Pub., 1977.

Rawick, George, ed. *The American Slave: A Composite Autobiography*, Supplement Series 2. Westport, Conn.: Greenwood Pub., 1979.

Smith, William. *A New Voyage to Guinea describing the customs, manners, soil, climate, habits, buildings, education, manual arts, agriculture, trade, employments, languages, ranks of distinction, habitations, diversions, marriages, and whatever else is memorable among the inhabitants likewise an account of their animals, minerals, &c.* London: Frank Cass & Co., 1967.

Snelgrave, William. *A New Account of Some Prats of Guinea and the Slave-Trade*. London: Frank Cass & Co. Ltd, 1971.

Starobin, Robert S., ed. *Blacks in Bondage: Letters of American Slaves*. 2<sup>nd</sup> ed. Princeton: Markus Wiener Publishers, 1994. Print.

Tyler, Lyon Gardiner, ed. *Narratives of Early Virginia, 1606-1625*. New York: Charles Scribner's Sons, 1907. Reprint, New York: Barnes and Noble, 1952.

#### Secondary Sources

Agyemang, K., R.H. Dwinger, A.S. Grieve, and M.L. Bah. "Milk Production Characteristics and Productivity of N'Dama Cattle Kept Under Village Management in The Gambia." *Journal of Dairy Science* 74, no. 5 (1991): 1599-1608. DOI: 10.3168/jds.S0022-0302(91)78322-7.

Alsan, Marcella. "The Effect of the TseTse Fly on African Development." *The American Economic Review* 105, no. 1 (2015): 382-410. <http://www.jstor.org/stable/43497064>.

Aminullah Bhuiyan, A.K.M., W.M.N. Ratnayake, and R.G. Ackman. "Nutritional Composition of Raw and Smoked Atlantic Mackerel (*Scomber scombrus*): Oil- and Water-Soluble Vitamins." *Journal of Food Composition and Analysis* 6, no. 2 (1993): 172-184. DOI: 10.1006/jfca.1993.1019.

Andrews, William. *Famous Frosts and Frost Fairs in Great Britain: Chronicled from the Earliest to the Present Time*. London, George Redway, 1887.

Anihouvi, Victor B., Euloge Y. Kpoclou, and Joseph D. Hounhouigan, "Use of starter cultures of *Bacillus* and *Staphylococcus* in the controlled fermentation of Lanhouin, a traditional fish-based condiment from West Africa," *African Journal of Microbiology Research* 6, no. 22 (2012): 4767-4774. DOI: 10.5897/AJMR12.413.

- Aro, Tarja L., Petra S. Larmo, Christina H. Bäckman, Heikki P. Kallio, and Raija L. Tahvonon. "Fatty Acids and Fat-Soluble Vitamins in Salted Herring (*Culpea harengus*) Products." *Journal of Agricultural and Food Chemistry* 53, no. 5 (2005): 1482-1488. DOI: 10.1021/jf0401221
- Atkins, Stephen Charles. "An Archaeological Perspective on the African-American Slave Diet at Mount Vernon's House for Families." Master's thesis, College of William and Mary, 1994.
- Berlin, Ira, and Philip D. Morgan, eds. *Cultivation and Culture: Labor and the Shaping of Slave Life in the Americas*. Charlottesville, VA.: University Press of Virginia, 1993.
- Berry, Daina Ramey. *The Prince for Their Pound of Flesh: The Value of the Enslaved from Womb to Grace in the Building of a Nation*. Boston: Beacon Press, 2017.
- Billings, Warren M., ed. *The Old Dominion in the Seventeenth Century: A Documentary History of Virginia, 1606-1689*. Chapel Hill: University of North Carolina Press, 1975.
- Bjarnadottir, Adda., Asa Gudrun Kristjansdottir, Hannes Hrafnkelsson, Erlingur Johannsson, Kristjan Thor Magnusson, and Inga Thorsdottir. "Insufficient autumn vitamin D intake and low vitamin D status in 7-year-old Icelandic children." *Public Health Nutrition* 18, no. 2 (2015): 208-217. DOI: 10.1017/S1368980013003558.
- Bledsoe, G.E., C.D. Bledsoe, and B. Rasco. "Caviars and Fish Roe Products." *Critical Reviews in Food Science and Nutrition* 43, no. 3 (2003): 317-356. DOI: 10.1080/10408690390826545.
- Bodenhorn, Howard. "A Troublesome Caste: Height and Nutrition of Antebellum Virginia's Rural Free Blacks." *Journal of Economic History* 59, no. 4 (1999): 972-996. DOI: 10.1017/S0022050700024104.
- Bower, Anne L., ed. *African American Foodways: Explorations of History & Culture*. Urbana, IL.: University of Illinois, 2009.
- Brönnimann, Stefan, Jörg Franke., Samuel U. Nussbaumer, Heinz J. Zumbühl, Daniel Steiner, Mathias Trachsel, Gabriele C. Heger, Andrew Schurer, Matthias Worni., Abdul Malik., Julian Flückiger, and Christoph C. Raible. "Last phase of the Little Ice Age forced by volcanic eruptions." *Nature Geoscience* 12, no. 8 (2019): 650-656. DOI: 10.1038/s41561-019-0402-y.
- Cardell, Nicholas Scott, and Mark Myron Hopkins. "The Effect of Milk Intolerance on the Consumption of Milk by Slaves in 1860." *The Journal of Interdisciplinary History* 8, no. 3 (1978): 507-513. <https://www.jstor.org/stable/202919>.
- Cardinale, M. and F. Arrhenius. "Decreasing weight-at-age of Atlantic herring (*Clupea harengus*) from the Baltic Sea between 1986 and 1996: a statistical analysis." *ICES Journal of Marine Science* 57, no. 4, (2000): 882-893. DOI: 10.1006/jmsc.2000.0575.

- Carson, Scott Alan. "Institutional Change and Variation in 19th-century Southern Blacks' and Whites' Body Mass Indices." *Journal of Institutional and Theoretical Economics* 170 (2014): 296-316. DOI: 10.1628/093245614X13801797311754.
- . "Institutional Change, Geography, and Insolation in Nineteenth Century African-American and White Statures in Southern States." *Journal of Economic Issues* 44, no. 3 (2010): 737-755. DOI: 10.2753/JEI0021-3624440308.
- Carney, Judith A. and Richard Nicholas Rosomoff. *In the Shadow of Slavery: Africa's Botanical Legacy in the Atlantic World*. Berkley: University of California Press, 2010.
- Cecchi, G., Mattioli, R.C., Slingenbergh, J. and De La Rocque, S. "Land cover and tsetse fly distributions in sub-Saharan Africa." *Medical and Veterinary Entomology* 22, no. 4 (2008): 364-373. DOI: 10.1111/j.1365-2915.2008.00747.x.
- Charoenngam, Nipith, Arash Shirvani, & Michael F. Holick. "Vitamin D for skeletal and non-skeletal health: What we should know." *Journal of clinical orthopaedics and trauma* 10, no. 6 (2019): 1082–1093. DOI: 10.1016/j.jcot.2019.07.004.
- Cole-Dai, Jihong, David Ferris, Alyson Lanciki, Joël Savarino, Mélanie Baroni, and Mark H. Thiemens. "Cold decade (AD 1810-1819) caused by Tambora (1815) and another (1809) stratospheric volcanic eruption." *Geophysical Research Letters* 36, no. 22 (2009): 1-6. DOI: 10.1029/2009GL040882.
- Covey, Herbert C., and Dwight Eisanach. *What the Slaves Ate: Recollections of African American Foods and Foodways from Slave Narratives*. Santa Barbara, CA.: Greenwood Press, 2009.
- Crader, Diana C. "Slave Diet at Monticello." *American Antiquity* 55, no. 4 (1990): 690-717. DOI: 10.2307/281246.
- Crowe, Francesca L., M. Zulf Mughal, Zabihullah Maroof, Jacqueline Berry, Musa Kaleem, Sravya Abburu, Gijs Walraven, Mohammad I. Masher, Daniel Chandramohan and Semira Manaseki-Holland. "Vitamin D for Growth and Rickets in Stunted Children: A Randomized Trial." *Pediatrics* 147, no. 1 (2021): 1-9. DOI: 10.1542/peds.2020-0815.
- Daly, Nicholas. "The Volcanic Disaster Narrative: From Pleasure Garden to Canvas, Page, and Stage." *Victorian Studies* 53, no. 2 (2011): 255-285. DOI: 10.2979/victorianstudies.53.2.255.
- Dent, Sophia C. "Interindividual differences in embodied marginalization." *American Journal of Human Biology* 29, no. 4 (2017): 1-16. DOI: 10.1002/ajhb.23021.
- Deetz, Kelley Fanto. *Bound to the Fire: How Virginia's Enslaved Cooks Helped to Invent American Cuisine*. Lexington, KY.: University of Kentucky Press, 2017.



- Deyle, Steven. *Carry Me Back: The Domestic Slave Trade in American Life*. Oxford: Oxford University Press, 2005.
- Druffel, Ellen R. M., Sheila Griffin, Desiree Vetter, Robert B. Dunbar, and David M. Mucciarone. "Identification of frequent La Nina events during the early 1800s in the east equatorial Pacific." *Geophysical Research Letters* 42, no. 5 (2015): 1512-1519. DOI: 10.1002/2014GL062997.
- Dunaway, Wilma A. *The African-American Family in Slavery and Emancipation*. Cambridge: Cambridge University Press, 2003.
- Dunn, Richard S. *A Tale of Two Plantations: Slave Life and Labor in Jamaica and Virginia*. Cambridge, MA.: Harvard University Press, 2014.
- Dupuis, Melanie E. *Nature's Perfect Food: How Milk Became America's Drink*. New York: New York University Press, 2002.
- Dusinberre, William. *Them Dark Days: Slavery in the American Rice Swamps*. Oxford: Oxford University Press, 1996.
- El Sheikha, A. F., R. Ray, D. Montet, S. Panda, and W. Worawattanamateekul, "African Fermented Fish Products in Scope of Risks." *International Food Research Journal* 21, no. 2 (2014): 425-432. ProQuest.
- Fildes, Valerie. *Breasts, Bottles & Babies: A History of Infant Feeding*. Edinburgh: Edinburgh University Press, 1986.
- Ernest, John, ed. *The Oxford Handbook of the African American Slave Narrative*. Oxford: Oxford University Press, 2014.
- Freeman, Andrea. "Unmothering Black Women: Formula Feeding as an Incident of Slavery," *Hastings Law Journal* 69, no. 6 (2018): 1545-1606.  
<https://heinonline.org/HOL/P?h=hein.journals/hastlj69&i=1546>
- Fogel, Robert William. *Without Consent or Contract: The Rise and Fall of American Slavery*. New York: W. W. Norton & Company, 1989.
- and Stanley L. Engerman. *Time on the Cross: the economics of American Negro slavery*, new ed. New York: Norton, 1989.
- and S. L. Engerman, eds. *Without Consent or Contract: The Rise and Fall of American Slavery*. Vol. 2 of *Technical Papers: Conditions of Slave Life and the Transition to Freedom*. New York: W. W. Norton, 1992.
- Gaffney-Stomberg, Erin & James P. McClung. "Calcium and vitamin D supplementation maintains parathyroid hormone and improves bone density during initial military training: A randomized, double-blind, placebo controlled trial." *Bone* 68 (2014): 46-56. DOI: 10.1016/j.bone.2014.08.002

- Golden, Janet. *A Social History of Wet Nursing: From Breast to Bottle*. New York: Cambridge University Press, 1996.
- Green, Toby. *A Fistful of Shells: West Africa from the Rise of the Slave Trade to the Age of Revolution*. Chicago: University of Chicago Press, 2019.
- Guevara-Murua, A., C. A. Williams, E. J. Hendy, A. C. Rust, and K. V. Cashman. "Observations of a stratospheric aerosol veil from a tropical volcanic eruption in December 1808: is this the Unknown ~ 1809 eruption?" *Climate of the Past* 10, no. 5 (2014): 1707-1722. DOI: 10.5194/cp-10-1707-2014.
- Haines, Michael R., Lee A. Craig, and Thomas Weiss. "Did African Americans experience the 'Antebellum Puzzle'? Evidence from the United States Colored Troops during the Civil War." *Economics and Human Biology* 9 (2011): 45-55. DOI: 10.1016/j.ehb.2010.06.00.
- Hall, Robert L. "Africa and the American South: Culinary Connections." *The Southern Quarterly* 44, no. 2 (2007): 19-52. ProQuest.
- Hammond, John Craig. "Slavery, Settlement, and Empire: The Expansion and Growth of Slavery in the Interior of the North American Continent, 1770-1820." *Journal of the Early Republic* 32, no. 2 (2012): 175-206. DOI: 10.1353/jer.2012.0029.
- Harris, Jessica B. *High on the Hog: A Culinary Journey from Africa to America*. New York: Bloomsbury, 2012.
- Hakim, Gregory J., Julien Emile-Geay, Eric J. Steig, David Noone, David M. Anderson, Robert Tardig, Nathan Steiger, and Walter A. Perkins. "The last millennium climate reanalysis project: Framework and first results." *Atmospheres* 121, no. 12 (2016): 6745-6764. DOI:10.1002/2016JD024751.
- Hertzler, Steven and Shannon M. Clancy. "Kefir improves lactose digestion and tolerance in adults with lactose maldigestion." *Journal of the American Dietetic Association* 103, no.5 (2003): 582-587. <https://doi.org/10.1053/jada.2003.50111>.
- Hightower, Joseph E., Anton M. Wicker, and Keith M. Endres. "Historical Trends in Abundance of American Shad and River Herring in Albemarle Sound, North Carolina." *North American Journal of Fisheries Management* 16, no. 2 (1996): 257-271. DOI: 10.1577/1548-8675.
- Hilliard, Sam Bowers. *Hog meat and Hoecake: Food Supply in the Old South, 1840-1860*. Rev. ed. Athens: University of Georgia Press, 2014.
- Hochman, Steven Harold. "Thomas Jefferson: A Personal Financial Biography." PhD diss., University of Virginia, 1987.
- Hunt, Kathy. *Herring: A Global History*. London: Reaktion Books, 2017.

- Itan, Yuval, Bryony L. Jones, Catherine J.E. Ingram, Dallas M. Swallow, and Mark G. Thomas. "A worldwide correlation of lactase persistence phenotype and genotypes." *BMC Evolutionary Biology* 10, no. 36 (2010): 1-11. <https://doi.org/10.1186/1471-2148-10-36>.
- Jones-Rogers, Stephanie E. *They were Her Property: White Women as Slave Owners in the American South*. New Haven: Yale University Press, 2019.
- Kierner, Cynthia A. *Martha Jefferson Randolph, Daughter of Monticello: Her Life and Times*. Chapel Hill: University of North Carolina Press, 2012.
- King, Wilma. *Stolen Childhood: Slave Youth in Nineteenth-Century America*, 2<sup>nd</sup> ed. Bloomington: Indiana University Press, 2011.
- Kiple, Kenneth F. and Virginia Himmelsteib King. *Another Dimension to the Black Diaspora: Diet, Disease and Racism*. Cambridge: Cambridge University Press, 1981.
- Komlos, John. "A Three-Decade History of the Antebellum Puzzle: Explaining the Shrinking of the U.S. Population at the Onset of Modern Economic Growth." *The Journal of the Historical Society* 13, no. 4 (2012): 395-445. DOI: 10.1111/j.1540-5923.2012.00376.x.
- and Bjorn Alecke. "The Economics of Antebellum Slave Heights Reconsidered." *The Journal of Interdisciplinary History* 26, no. 3 (1996): 437-457. DOI: 10.2307/206033.
- Kulikoff, Allan. *Tobacco and Slaves: The Development of Southern Cultures in the Chesapeake, 1680-1800*. Chapel Hill: University of North Carolina Press, 1986.
- Majewski, John, and Viken Tchakerian. "The Environmental Origins of Shifting Cultivation: Climate, Soils, and Disease in the Nineteenth-Century US South." *Agricultural History* 81, no. 4 (2007): 522-549. <http://www.jstor.org/stable/20454756>.
- Margo, Robert A., and Richard H. Steckel, "The Heights of American Slaves: New Evidence on Slave Nutrition and Health." *Social Science History* 6, no. 4 (1982): 516-538. <https://doi.org/1170974>.
- McCarthy, B. Eugene, and Thomas L. Doughton. *From Bondage to Belonging: The Worcester Slave Narratives*. Amherst, MA.: University of Massachusetts Press, 2007.
- McIntosh, Susan Keech, and Roderick J. McIntosh. "West African Prehistory: Archaeological studies in recent decades have illuminated the prehistory of this vast region, revealing unexpected complexity in its development from 10,000 B.C. to A.D. 1000." *American Scientist* 69, no. 6 (1981): 602-613. <https://www.jstor.org/stable/27850711>.
- McMahon, Sarah F. "All Things in Their Proper Season": Seasonal Rhythms of Diet in Nineteenth Century New England," *Agricultural History* 63, no. 2 (1989): 130-151. <https://www.jstor.org/stable/3743508>.
- McMann, James C. *Stirring the Pot: A History of African Cuisine*. Athens, OH.: Ohio University Press, 2008.

- Miller, Adrian. *Soul Food: The Surprising Story of an American Cuisine One Plate at a Time*. Chapel Hill: University of North Carolina Press, 2017.
- . *Black Smoke: African Americans and the United States of Barbecue*. Chapel Hill: University of North Carolina Press, 2021
- Mol, Suhendan and Sabahat Turan. “Comparison of Proximate, Fatty Acid and Amino Acid Compositions of Various Types of Fish Roes.” *International Journal of Food Properties* 11, no. 3 (2008): 669-677, DOI: 10.1080/10942910701611170
- Moreno-Chamarro, Eduardo, Davide Zanchettin, Katja Lohmann, and Johann H. Jungclaus. “An abrupt weakening of the subpolar gyre as trigger of Little Ice Age-type episodes.” *Climate Dynamics* 48 (2017): 727-744. DOI:10.1007/s00382-016-3106-7.
- Morgan, Philip D. *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake and Lowcountry*. Chapel Hill: University of North Carolina Press, 1998.
- Morton, Richard. *Colonial Virginia*. Vol 2, *Westward Expansion and Prelude to Revolution, 1710-1763*. Chapel Hill: University of North Carolina Press, 1960.
- Munger, Michael Sean. “Ten Year of Winter: The Cold Decade and Environmental Consciousness in the Early 19th Century.” PhD diss. University of Oregon, 2017.
- Northrup, David. “The Growth of Trade among the Igbo before 1800.” *The Journal of African History* 13, no. 2 (1972): 217-236. <https://www.jstor.org/stable/180852>.
- Oglivie, A. E. J., and T. Jonsson. ““Little ice age” research: A perspective from Iceland.” *Climatic Change* 48, no. 1 (2001a): 9-52. DOI:10.1023/A:100562729889.
- Ogungbenro, Stephen Bunmi, and Yobi Eniolu Morakinyo. “Rainfall distribution and change detection across climatic zones in Nigeria.” *Weather and Climate Extremes* 5, no. 6 (2014): 1-6. DOI: 10.1016/j.wace.2014.10.002.
- Opie, Frederick Douglass. *Hog and Hominy: Soul Food from Africa to America*. New York: Columbia University Press, 2008.
- Pavão-Zuckerman, Barnet, Scott Oliver, Chance Copperstone, Matthew Reeves and Marybeth Harte. “African American Culinary History and the Genesis of American Cuisine: Foodways and Slavery at Montpelier.” *Journal of African Diaspora Archaeology and Heritage* 9, no. 2 (2020): 114-147. DOI: 10.1080/21619441.2021.1909403.
- Perry, Tony C. “In bondage when cold was king: the frigid terrain of slavery in antebellum Maryland.” *Slavery & Abolition* 38, no. 1 (2017): 23-36. DOI: 10.1080/0144039X.2017.1284923.
- Prewitt Jr., Wiley C. “Bodies of the Dead: The Wild in Southern Foodways,” in *The Larder: Food Studies Methods from the American South*, edited by John T. Edge, Elizabeth S.D.

- Engelhardt, Ted Ownby, and Sara Camp Milam. Athens: University of Georgia Press, 2013.
- Rajah, Jaishen, Jamal A. Jubeh, Afrozul Haq, Amani Shalash, and Howard Parsons. "Nutritional rickets and z scores for height in the United Arab Emirates: To D or not to D." *Pediatrics International* 50, no.4 (2008): 424-428. DOI:10.1111/j.1442-200X.2008.02700.x.
- Roberts, Justin. *Slavery and the Enlightenment in the British Atlantic*. New York: Cambridge University Press, 2013.
- Saberi, Helen, ed. *Cured, Smoked, and Fermented: Proceedings of the Oxford Symposium on Food*. Devon, UK: Prospect Books, 2011.
- Samuel, O.M., J.O. Olopade, and S.K. Onwuka. "Neurometric evaluations on the brain of the opossum (*didelphys marsupialis cancrivora* (linnaeus 1758) - a case for cognitive skill - brain development capacity." *Journal of Morphological Sciences* 31, no.3 (2014): 139-145. DOI: 10.4322/jms.038714.
- Sanni, A. I., M. Asiedu, and G. S. Ayernor. "Microflora and Chemical Composition of Momoni, a Ghanaian Fermented Fish Condiment." *Journal of Food Composition and Analysis* 15 (2002): 577-583. Doi: 10.1006/jfca.2002.1063
- Savaiano, Dennis A. and Robert W. Hutkins, "Yogurt, cultured fermented milk, and health: a systematic review," *Nutrition Reviews* 79, no. 5 (2021): 599-614. <https://doi.org/10.1093/nutrit/nuaa013>.
- Schmid, Alexandra, & Barbara Walther. "Natural vitamin D content in animal products." *Advances in nutrition* 4, no. 4 (2013): 453-462. doi:10.3945/an.113.003780.
- Schneider, Eric B. "Children's growth in an adaptive framework: explaining the growth patterns of American slaves and other historical populations." *Economic History Review* 70, no. 1 (2017): 3-29. <https://doi.org/10.1111/ehr.12484>.
- Schleussner, C. F., and G. Feulner, "A volcanically triggered regime shift in the subpolar North Atlantic Ocean as a possible origin of the Little Ice Age." *Climate of the Past* 9 (2013): 1321-1330. DOI:10.5194/cp-9-1321-2013.
- Sidbury, James. *Ploughshares into Swords: Race, Rebellion, and Identity in Gabriel's Virginia, 1730-1810*. Cambridge: Cambridge University Press, 1997.
- Smith, S.M., K.K. Gardner, J. Locke, and S.R. Zwart. "Vitamin D supplementation during Antarctic winter." *American Journal of Clinical Nutrition* 89, no. 4 (2009): 1092-1098. DOI: 10.3945/ajcn.2008.27189.
- Smolin, Lori A., Mary B. Grosvenor, and Debbie Gurfinkel. *Nutrition: Science and Applications*. 2nd Canadian ed. Mississauga, ON.: John Wiley & Sons, 2015.

- Steckel, Richard H. "Slave Mortality: Analysis of Evidence from Plantation Records." *Social Science History* 3, no. 3 (1979a): 86-114. DOI:10.2307/1170958.
- . "Slave Height Profiles from Coastwise Manifests." *Explorations in Economic History* 16, no. 4 (1979b): 363-380. DOI:10.1016/0014-4983(79)90027-5.
- . "A peculiar population: The nutrition, health, and mortality of American slaves from childhood to maturity." *Journal of Economic History* 46, no. 3 (1986): 721-741. <https://www.jstor.org/stable/2121481>.
- . "Stature and the Standard of Living." *Journal of Economic Literature* 33, no. 4 (1995): 1903-1940. <https://www.jstor.org/stable/2729317>.
- . "Biological Measures of the Standard of Living." *The Journal of Economic Perspectives* 22, no. 1 (2008): 129-152. DOI: 10.1257/jep.22.1.129.
- Sutch, Richard. "The Treatment Received by American Slaves: A Critical Review of the Evidence Presented in "Time on the Cross"." *Explorations in Economic History* 12, no. 4 (1975): 335-438. DOI: 10.1016/0014-4983(75)90019-4.
- Swanson, Drew A. *A Golden Weed: Tobacco and Environment in the Piedmont South*. New Haven: Yale University Press, 2014.
- Taylor, Alan. *The Internal Enemy: Slavery and War in Virginia, 1772-1832*. New York: W.W. Norton & Company, 2015.
- Timmreck, Claudia, Matthew Toohey, Davide Zanchettin, Stefan Brönnimann, Elin Lundstad, and Rob Wilson. "The unidentified volcanic eruption of 1809: why it remains a climatic cold case." *Climate of the Past* 17, no. 4 (2021) 1455-1482. doi:10.5194/cp-17-1455-2021.
- Twitty, Michael W. *The Cooking Gene: A Journey Through African American Culinary History in the Old South*. New York: HarperCollins, 2017.
- Valenze, Deborah M. *Milk : A Local and Global History*. Yale University Press, 2011.
- Vecchi, Tomaso and Daniele Gatti. *Memory as Prediction: From Looking Back to Looking Forward*. Cambridge, MA.: MIT Press, 2020.
- Wallah, Jennifer Jensen. *Getting What We Need Ourselves: How Food has Shaped African American Life*. Lanham, MD.: Rowman & Littlefield, 2019.
- Warnes, Andrew. *Savage Barbecue: Race, Culture, and the Invention of America's First Food*. Athens, GA.: University of Georgia Press, 2008.
- Webb, Ann R., & Michael F. Holick. "The role of sunlight in the cutaneous production of vitamin D3." *Annual review of nutrition* 8, no. 1 (1988): 375-399. <https://doi.org/10.1146/annurev.nu.08.070188.002111>.

White, Deborah Gray. *Ar'n't I A Woman?: Female Slaves in the Plantation South*. W. W. North & Company, 1985.

Wiley, Andrea S. *Re-Imagining Milk: Cultural and Biological Perspectives*. New York: Routledge, 2016.

Wood, Gillen D'Arcy. *Tambora: The Eruption that Changed the World*. Princeton, NJ.: Princeton University Press, 2014.

Yentsch, Anne E. *A Chesapeake Family and Their Slaves: A Study in Historical Archaeology*. Cambridge: Cambridge University Press, 1994.

## APPENDIX A

Butter production per pound across the eastern and southern American states.

	1850			1860		
	PER MILK POUNDS	PER COW	PER CAPITA	POUNDS	PER MILK COW	PER CAPITA
<b>The East</b>						
Maine	9,244	69	16	11,688	80	19
New Hampshire	6,977	74	22	6,957	73	21
Vermont	12,138	83	39	15,900	91	51
Massachusetts	8,071	62	8	8,298	58	7
Rhode Island	996	52	7	1,022	51	6
Connecticut	6,498	76	18	7,621	77	17
New York	79,766	86	26	103,097	92	27
New Jersey	9,487	80	19	10,714	77	16
Pennsylvania	39,878	75	17	58,654	87	20
Delaware	1,055	56	12	1,431	62	13
Maryland	3,806	43	7	5,265	53	8
<b>The South</b>						
Virginia	11,089	35	9	13,465	41	8
North Carolina	4,146	19	5	4,735	21	5
South Carolina	2,982	16	5	3,178	19	5
Georgia	4,641	14	5	5,340	18	5
Florida	371	5	4	409	4	3
Alabama	4,009	18	5	6,028	26	6
Mississippi	4,346	20	7	5,007	24	6
Louisiana	683	6	1	1,445	11	2
Arkansas	1,854	20	9	4,068	24	9
Tennessee	8,140	34	8	10,018	40	9
Kentucky	9,948	40	10	11,717	44	10
Texas	2,345	11	11	5,851	27	14

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Sources: Data from Sam Bowers Hilliard *Hog meat and Hoecake: Food Supply in the Old South, 1840-1860*, rev. ed. (Athens: University of Georgia Press, 2014), 135, table 9.