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OF STRUCTURE AND SOCIETY: TENNESSEE MARBLE IN CIVIC ARCHITECTURE

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On my return to Tennessee, I contacted an expert in both architectural and Tennessee history, Dr. Carroll Van West, who offered me a short-term research fellowship at the Center for Historic Preservation, Middle Tennessee State University. Those few months provided an opportunity to gather my research and opened the way for me to begin pursuing the topic in earnest. With

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What I have accomplished in life is due in large measure to the foresight and guidance of my parents Lawrence H. and Margaret Anderson Williams—role models of intellectual curiosity—who made my education their priority. The selfless and unwavering support of my husband, Andrew Saftel, who has shared my enthusiasm for this project from the outset, has made all the difference.

ABSTRACT

The success of the Tennessee marble industry is due to a combination of cultural idealism and economic imperatives. Desire for marble building materials can be traced to the marriage of architecture and political idealism of the early national period. George Washington and Thomas Jefferson wanted the buildings of the national capital to represent republican strength and incorruptibility. Under the influence of Benjamin Latrobe and others familiar with neoclassical styles in England and France, the building programs of the new nation reflected the long-lasting monuments of classical antiquity – both in style and materials.

Nineteenth-century amateur scientists were fascinated by America's natural resources. Geology quickly evolved from pure scientific inquiry to resource development. States like Tennessee commissioned geological surveys with a view to exploiting their natural resources, and geologists may well have been responsible for establishing the Tennessee "marble" brand. After a national political debate over appropriate construction materials for federal architecture, Tennessee marble appeared in three significant architectural interiors of the 1850s: The Washington National Monument, Tennessee State Capitol, and United States Capitol Extensions. While individual actors involved

in these projects influenced the industry's rise, the development of railroad transportation directed where marble was used and how it was promoted.

Tennessee marble became widely available by rail at the same moment as American Renaissance architecture came into vogue. Even though, by this time, it was understood by geologists to be a semi-crystalline limestone, it continues to be called marble to this day. The popular colored stone appeared as interior decoration along the new urban corridors created by railroad expansion. By the early 1900s, it was also the material of choice for prestige exterior construction, such as that of the Morgan Library. The steady national building boom that supported the industry well into the 1920s had begun to wane by the Great Depression. While a wave of New Deal federal buildings revived demand briefly, only one Tennessee marble firm survives today. Yet the ongoing preference for classical style in public buildings, whose architectural programs require long-lasting materials with high-crushing thresholds and non-absorbing surfaces, continues to create intermittent demand for Tennessee marble.

PREFACE

Seven years ago, while researching Tennessee-related art in the collections of the United States Capitol, I was informed by a New York-based art conservator that the designation Tennessee "marble" was a misnomer. Enthralled by having just learned how prominently the colorful stone figured in the interiors of the 1850s Capitol Extensions, I wrote the remark off as a backhanded put-down. I continued to amass materials and pursue research on an industry that was once one of Tennessee's proudest calling cards.

During the residency component of the Public History program at Middle Tennessee State University I spent time with Dr. Ronald Zurawski and his colleagues in the Tennessee Division of Geology in order to confront the needling remark that had so rankled several years prior. According to contemporary geologists, Tennessee marble is not a true marble (not a completely metamorphosed stone). This dissertation proposes that the use of the label "marble," still in common usage as a designation for certain colors and grades of Tennessee limestone, be viewed as a social construction. If the choice to label the stone "marble" is one that humans continue to make, then there must be some reward in it.

Who first called it marble? Who would have been most affected by the use of such a prestigious label for the colorful limestone of East Tennessee? Was Tennessee marble more important as an example of the untold riches that

awaited those who explored the frontier west, or as a visible symbol of the state for politically ambitious Tennesseans?

Marble as material facilitated a number of agendas for nineteenth-century Tennesseans. When it was easily obtainable, it was used as a dimensional stone for building construction. When polished, it revealed itself as a decorative and maintenance-free interior finish that became popular for civic architectures. The industry created a demand for skilled labor and new technology. The promising market for decorative interior marbles prompted investment in marble businesses, which also coincided with railroad expansion within the state. Ultimately, Tennessee marble became a high value railroad commodity. Its exposure in prestigious public buildings around the country served as a physical representation of the state and added status to Tennessee's image.

While it is not entirely clear when geologists recognized that Tennessee marble had never been fully transformed from the limestone state, and some prominent nineteenth and early twentieth-century geologists never did make the distinction, the question remains: did Tennessee geologists downplay the distinction or were they the first to recognize it? In either case, they were likely compelled by economic development imperatives to resist changing the designation.

Although the once-prominent industry is now nearly forgotten, significant public buildings around the country that contain Tennessee marble

remain icons of local and national civic pride. And the stone continues to be called Tennessee marble by architects and engineers. Because it is a first-class dimensional building material, based on characteristics like hardness, insolubility, and imperviousness to load-bearing pressure, it continues to be the material of choice for important civic projects. Tennessee marble has also endured for interior use, particularly flooring, because it is wear-resistant, it comes in a variety of colors, it is non-odor and stain resistant, and it takes a fine and durable polish. Marble or not, the tried and true stones of Tennessee have earned a permanent place in American history.

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CHAPTER I

INTRODUCTION: EXPLOITING THE WEALTH

> It is not always gray, sometimes it is a reddish brown, and sometimes white. Immense quantities of it, possessing either a grayish or reddish brown colour, are found in the vicinity of Knoxville, East Tennessee. One range of it is crossed by every road, passing to the south and east of Knoxville. Its appearance is that of some variegated marbles; white veins penetrate it, and wind through it in every direction. Whether any part of it has a texture sufficiently fine and firm to be wrought to advantage, is yet to be determined. To the eye of a superficial observer, there are many indications that it has.
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> — Reverend Elias Cornelius (1819)[1]

Traveling through upper East Tennessee on the road from Boston to New Orleans, motorists following Elias Cornelius's 1818 route today might barely notice the limestone walls rising up on either side of the interstate highway. Like others who visited the undeveloped back country of recently formed states like Tennessee, the Reverend Cornelius was a student of natural science. He was intent on exploring the wealth of resources that lay before him as he traveled by stagecoach from Virginia through upper East Tennessee and impressed by the stone outcroppings that formed part of the roadbed. In wondering how this stone might have looked when polished, he was among the first to imagine the potential wealth in marble in East Tennessee.

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[1] Elias Cornelius, "On the Geology, Minerology, Scenery and Curiosities of Parts of Virginia, Tennessee, and the Alabama and Mississippi Territories, &c. with Miscellaneous Remarks, in a letter to the Editor," *American Journal of Science* 1, no. 3 (1819): 214.

That same year, J. D. Clifford traveled from Lexington, Kentucky to the new national capital city of Washington by way of Tennessee and Virginia. He also noted geological formations along the way. In Tennessee's Cumberland Mountains, as he traveled over Clinch Mountain, Clifford noted sandstone and limestone there, commenting that a "person from New-York" was quarrying millstones there "as good as any procured in our Atlantic cities." He entered the Holston River valley and followed it to Rogersville, Tennessee, where, as his route crossed the stage road, Clifford observed "marble of various hues … of a light red colour."[2]

Interest in Tennessee's geology was not confined to visitors to the state. On 2 May 1814, Tennessee Congressman and former Governor John Sevier apparently took a sample of East Tennessee marble to show to Giovanni Andrei, who was one of the two primary sculptural carvers then working at the United States Capitol. He wrote in his diary: "Went to the Capitol to see Mr. Andrei an Italian worker in Marble, who says mine is very fine and valuable."[3]

Knoxville resident John H. Kain submitted two papers to the *American Journal of Science* in 1819.[4] One described minerals found in southwestern Virginia

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[2] [J.D. Clifford], *The Western Review and Miscellaneous Magazine, a Monthly Publication, Devoted to Literature and Science* 2, no. 6 (1820): 323.

[3]Cora Bales Sevier and Nancy S. Madden. *Sevier Family History* (Washington, D.C.: Kaufmann Printing Co., 1961), 21; Diary Entry by John Sevier, 2 May 1814, Sevier Letters and Papers, Mississippi Department of Archives and History, Jackson, MS.

[4]John H. Kain, "Remarks on the Minerology and Geology of the Northwestern* part of the State of Virginia, and the Eastern part of the State of Tennessee" *American Journal of Science* I, no. 1 (1818):60-67; John H. Kain, "An Account of Several Ancient Mounds, and of Two Caves, in East Tennessee," *American Journal of Science* 1, no. 4

and eastern Tennessee, and the other related his own excavations of mounds and caves in the vicinity of the Holston and French Broad Rivers. Kain, who had graduated from Yale University in 1816, returned to Tennessee to take up the practice of medicine, but also applied his geological knowledge to what he found there.[5]

Kain's paper referred to William Maclure's geological map, one of the earliest geologic maps to include Tennessee, observing that the same "transitional" classification could be applied to East Tennessee as to "northwestern" Virginia.[6] Although he appears to have located it in visible outcroppings, Kain made no mention of marble. Instead he reported the limestone he saw in the valleys and

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(1819): 428-430. Kain is describing what is now the northeastern portion of West Virginia and southwestern portion of Virginia in this paper.

[5] James X. Corgan, *Geology in Antebellum Tennessee: Bulletin 85* (Nashville: Tennessee Division of Geology, 2002), 57; Kain's second contribution to the *Journal* is the earliest published documentation of Tennessee archaeology. In it, he speculated that the paintings he had seen in East Tennessee caves were created by Cherokee Indians. Bobby Braly and Shannon Koerner, "A History of Archaeology in Tennessee, Chapter II," http://web.utk.edu/~anthrop/research/TennesseeArchaeology/index.html [accessed 24 April 2011]

[6] Maclure published geological maps of the continental United States in 1809, 1811, 1817, and 1818. Geological historian James X. Corgan does not believe he ever came to Tennessee, while geologist L.C. Glenn, who wrote a history of Tennessee's geologists in 1912, believed he might have visited East Tennessee. Nonetheless, Maclure's classification system, which drew on that of eighteenth century German scientist A. G. Werner, influenced those who created early geologic maps of Tennessee.The oldest to youngest classification: primary or primitive (crystalline rocks) to transitional (tilted sedimentary rocks) to secondary (flat-lying sedimentary rocks) to tertiary (compacted sediments) can be seen in Troost's maps as well as in Safford's 1855 map. Corgan, op. cit., 21-23; L.C. Glenn, "The Growth of Our Knowledge of Tennessee Geology," *Resources of Tennessee 2*, no. 5 (1912): 169.

riverbank bluffs as "interspersed with veins of the crystallized carbonate of lime, more or less perfect, and of a pure but opaque white. Another variety of this limestone, not so abundant, is that which is white and red, having the white and red spots intimately mingled." [7]

In 1823, Judge John Haywood, who called himself "historian of the western country," provided a list of specific landowners and locations for East Tennessee marble:

> Six miles south of Rogersville on the lands of Judge Powell is an abundance of fine marble of various colors. There is a hill two and a half miles east of north from Rogersville, wholly composed of marble, white, grey, and sometimes red. Also on the road eight miles west of Rogersville. Also on the north of Bean's Station, a mile from the top of Clinch Mountain. Also between Mr. Cain's and Knoxville. The marble here is white. Also on the south side of Knoxville, on the road leading from Sevierville to Knoxville. Also between Campbell's Station and Mr. Meredith's. Also between Blountsville and Jonesborough. South from Blountsville, on the south side of Holston and two miles from it, is red marble. Also large quantities in Jefferson County. A vein of grey and variegated marble extends along the north side of Clinch Mountain for fifty miles, a great proportion of it very fine, and the vein of considerable breadth.[8]

The methodology used by Haywood in compiling his *Natural and Aboriginal History of Tennessee* (1823) was likely based on personal interviews rather than the deductive reasoning employed by Kain. Perhaps the 1828 discovery of gold in Georgia prompted the members of the Tennessee General Assembly to appoint a state geologist, but as evidenced by the preceding accounts, they may already have

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[7] Kain, "Remarks on the Minerology," 61-62.

[8] John Haywood, *The Natural and Aboriginal History of Tennessee* (1823; reprint Kingsport: F.M. Hill-Books, 1973), 12-13. Could the Cain referred to be related to John H. Kain?

suspected that the state contained mineral resources that could be parlayed into wealth for the state.[9] Such early observations, combined with the presence in Nashville of Gerard Troost, an eminent natural scientist who had arrived in 1827, resulted in Tennessee's being one of the earliest states to undertake a geological survey.[10]

Troost's visibility was no doubt magnified by his association with Philip Lindsley's progressive and politically prominent university.[11] Troost had been appointed professor of chemistry, mineralogy, and geology at the University of Nashville in 1828.[12] By 1837, the curriculum included not only those courses, but also languages, literature, history, fine arts, Biblical studies, archaeology, physiology,

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[9] Gerard Troost, "Address Delivered Before the Legislature of Tennessee, at Nashville," *Transylvania Journal of Medicine and the Associate Sciences* 4, no. 4 (1831): 491-507. Troost's introductory paragraph mentions that many of the people he encountered while traveling through the state thought he was searching for gold.

[10]James X. Corgan, "Geology," in *Tennessee Encyclopedia of History and Culture*, Carroll Van West, ed. (Nashville: Tennessee Historical Society, 1998).

[11] John F. Woolverton, "Philip Lindsley and the Cause of Education in the Old Southwest," *Tennessee Historical Quarterly* 19, no. 1 (1960), 12. Lindsley, who had left the presidency of Princeton University in 1824 to come to Nashville, aspired to create there a preeminent institution of higher learning that would rival the best European universities. On the university board were prominent statesmen Felix Grundy, William Carroll, George W. Campbell, Andrew Jackson, and John Bell, as well as State Librarian Return J. Meigs. Lindsley's ambition was not only to hire fine professors, but also to equip the school with libraries of books and curious objects as well as practical learning environments such as botanical gardens, and astronomical and chemistry laboratories.

[12] Glenn, 175.

engineering, and mechanics.[13] Troost's academic position and permanent status in Nashville may have contributed to make Tennessee's First Geological survey, which outlasted other early efforts.[14] North Carolina's, which began in 1823, was abandoned two years later.[15] South Carolina and Massachusetts also undertook surveys, in 1825 and 1830, respectively.[16] Alabama and Kentucky called upon geology professors at their state universities for occasional reports designed to assist the states in promotion of their natural resources.[17] Tennessee legislators must have foreseen a permanent gain from the survey work; no other geological survey was sustained as long as Tennessee's first survey, which extended nearly twenty years.[18]

The official geologic history of Tennessee began with the hiring of Troost as State Geologist and the commissioning of the First Geological Survey on December

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[13] Ibid., 19-20.

[14] Charles W. Wilson, Jr., *State Geological Surveys and State Geologists of Tennessee*: *A History of the Development of the Division of Geology, Department of Conservation.* [Bulletin 81] (Nashville: Tennessee Division of Geology, 1981), 3.

[15] James X. Corgan and Michael Gibson, "Geological Exploration in Tennessee: Gerard Troost's Travels in 1834," *Tennessee Historical Quarterly* 54, no. 2 (1995), 148.

[16] Wilson, 3.

[17] Albert E. Cowdrey, *This Land, This South: an Environmental History*, rev. ed. (Lexington, KY: University Press of Kentucky, 1996), 99.

[18] Wilson, 3.

21, 1831.[19] A native of Holland, Troost had moved to Tennessee by way of New Harmony, Indiana, from Philadelphia. That city was this country's major center of learning in the early national period. While there, Troost had been a professor of mineralogy at the Museum of Natural History, a member of the Philosophical Society, and a founding member of the Academy of Natural Sciences.[20] He brought twenty-seven years of experience in natural history fieldwork to his new post in Tennessee, having served as Keeper of the Royal Cabinet of Minerals in the Netherlands and worked in the Museum of Natural History in Paris before coming to the United States.[21]

Apparently at his own behest, Troost had appeared before the Tennessee state legislature on October 19, 1831 to extol the virtues of Tennessee, exhorting members to help advance their state by allowing its resources to be developed. Using flowery, persuasive prose, he declaimed:

> The forests of our boundless region, are daily falling before the ceaseless streams of civilized emigration; and populous towns are springing up, like an exhalation from the soil, changing the wigwam of the savage for the mansion of the white man, and the howlings of the wild beasts for the busy hum of social life.[22]

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[19] Ibid., 2.

[20] Gerard Troost, "Address," 491; Wilson, 1.

[21] Corgan, *Geology in Antebellum Tennessee*, 141.

[22] Troost, "Address," 492.

Despite the overblown prose and colonialist sentiments, Troost's words contained a sound plea for judicious stewardship. Instead of advocating a headlong transformation of Tennessee's rural landscape, he offered sage advice about industrial development. He cautioned the legislators to weigh options and match crops to the best use of agricultural land, to carefully manage the extraction of the state's most valuable natural resources so that mines and quarries would not be spoiled by early efforts, to urge that construction of plants for processing be near natural resources and outlets for transportation, and to avoid amassing large working class populations in any one place and for any one type of manufactory.[23] He based these observations on his own experience, both in Europe and in the eastern United States, where he had resided before coming to "my present, and I hope, permanent abode." [24]

In the same address, Troost reported to the legislature that he had visited only a small part of the state, but had already found the Cumberland Mountains rich in iron ore and coal, which he opined was far more valuable in the long term than gold, and near enough to the Tennessee River that a railroad link would be easily affordable. [25] He described the countryside of upper East Tennessee as rich in zinc

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[23] Troost, 504, 494-497.

[24] Ibid., 492.

[25] Ibid., 499-500.

ore, adding that "in several places lead is found, and there is every indication of marble of as many varieties, and equal if not superior to the finest Italian."[26]

Troost was sufficiently persuasive; the legislature commissioned a geologic survey. Neither of his first two reports: the address to the legislature in 1831, and another address given in 1833, was issued as a separate publication.[27] The 1831 report included drawings and perhaps a map. Geological historian James X. Corgan has suggested that the reason these were not published is that there was no legislative precedent for lengthy illustrated publications.[28] Perhaps the report seemed preliminary since Troost had not yet been hired, or maybe the legislature wanted to give native industry time to develop before announcing Tennessee's rich natural resources to the world at large. Undaunted, the eager Troost found other places to publish his reports.[29]

Jefferson County resident Jacob Peck, a former clerk in the General Assembly, who had been appointed to the Tennessee Supreme Court in 1829, published an

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[26] Ibid., 498.

[27] James X. Corgan and Michael A. Gibson, "Geological Exploration …", 148.

[28]Corgan, *Geology in Antebellum Tennessee*, 49.

[29] Troost's 1831 address was published in Transylvania Journal of Medicine and the Associate Sciences 4 (1831): 491-507. An abstract of what was to be his tenth and final report was published the year before his death in the *American Journal of Science and Arts* 2, no. 8 (1849): 419-420.

article on gold mining in the *American Journal of Science and Arts* in 1833, with a map (figure 1).[30]

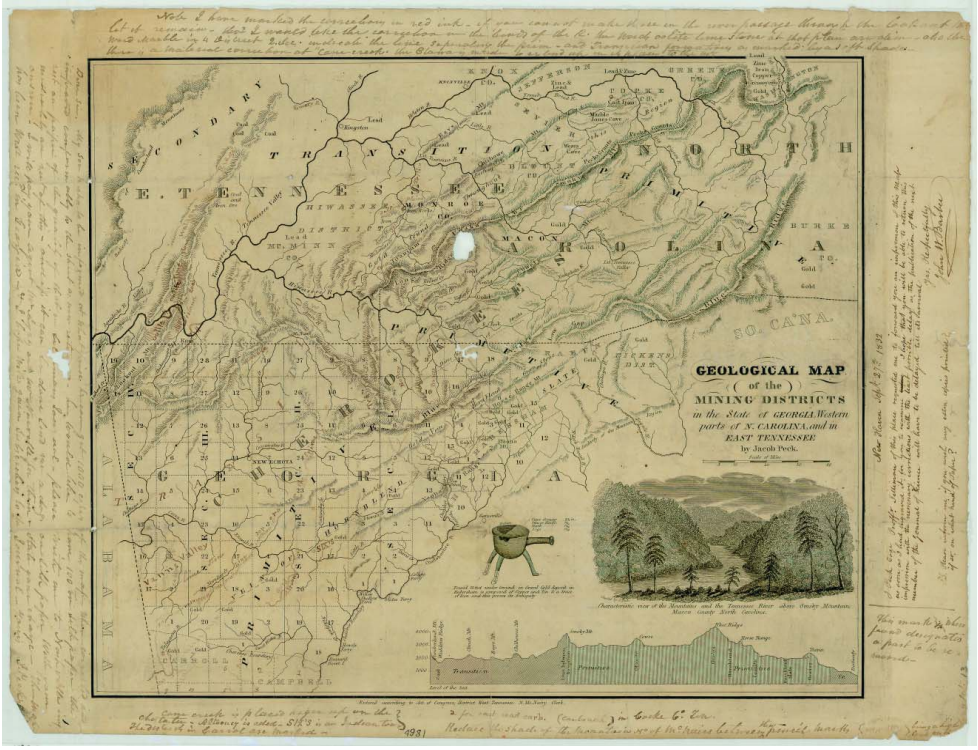

Figure 1. Jacob Peck, *Geological and Mineralogical Account of the Mining Districts in the State of Georgia—western part of N. Carolina and in East Tennessee*, 1832-3. Courtesy Tennessee State Library and Archives.

Peck remarked that there was probably as much or more gold to be had on private lands in Georgia as on tribal lands and described several "monuments" that revealed the ingenuity and mining prowess of the Native-American inhabitants of these regions. He also spoke respectfully of Professor Troost, stating that he had given

[30] Jacob Peck, "Geological and Mineralogical Account of the Mining Districts in the State of Georgia—western part of North Carolina and of East Tennessee, with a map," *American Journal of Science and Arts* 23 (1833): 1-10. This corrected proof of Peck's map (figure 1) is held in the manuscript collections of the Tennessee State Library and Archives.

Troost various samples collected in recent examinations of the mining areas. In the final paragraph of his article, after describing the veins of quartz containing gold in the Coco (sic) Creek vicinity of Tennessee, he mentioned marble:

> Leaving the auriferous regions, we reach the Chitteawee (sic) range of mountains; here roofing slate of a superior quality may be traced for fifty miles. Marbles of many and very beautiful varieties are traced parallel to the strata, which, as we observed through our excursions, have never lost their position. We have next the graywacke slate, and with it the red sandstone formation; lead, in a line parallel with the range of mountains, may be traced from Washington county into the Highwassa (sic) district.[31]

The interest in southern minerals coincided with the dawn of a new age of transportation. In *Atkinson's Saturday Evening Post*, in 1833, an author foresaw a future in which steam power combined with railroads would bridge long distances and act as a boon to trade with the "western" states. The anonymous author quoted a Mr. Flint, who extolled the virtues of Tennessee:

> Some of the great valleys are rich, beyond any of the same description, and as great a proportion of the cultivable land is first rate. In East Tennessee the soil contains an uncommon proportion of dissolved lime…Beautiful white, gray, and red marbles are frequent, while inexhaustible quarries of gypsum, of the finest quality, abound in East Tennessee, in positions favorable to be transported to the boatable waters. Burr mill stones are quarried from some of the Cumberland Mountains. One or two mines of lead have been worked, and iron ore is no where (sic) more abundant.[32]

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[31] Ibid., 10.

[32] [Mr. Flint], "Tennessee," *Atkinson's Saturday Evening Post* 13, no. 611 (1833): 3.

In 1835, the Tennessee State Legislature published Troost's detailed third report, which focused on coalfields, iron ore, and iron furnaces.[33] A fourth report divided the state into subdivisions and listed the geology and specific rocks of each. This often-cited report, delivered to the legislature in October 1837, may well have encouraged the creation of a full-fledged marble industry in Tennessee. In praising the many and varied limestones of the state, Troost pointed out a particular section of limestone, somewhere in the vicinity of the Hiwassee River:

> I beg leave to awaken the attention of the inhabitants of East Tennessee to the importance of the limestone. It contains some excellent marble. I have seen there Breccia marble which surpasses any that I know. Variegated marbles may be found there of endless varieties and of lively colors. I have seen them of uniform black color. Being situated in mountainous districts, sufficient water power may be found to saw and polish them. A district which is considered now unproductive and therefore uninhabitable, may by these means become the abode of an industrious, flourishing and numerous population.[34]

In this report, which also covered some of western North Carolina, Troost focused primarily on the Ocoee district of southeast Tennessee where he described mountains composed of alternating layers of graywacke and limestone. Of the limestone, he stated: "Much of the latter is fine marble, some gray, some dark gray with light colored veins, etc."[35]

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[33] Glenn, 178-179.

[34] Gerard Troost, *Fourth Geological Report to the Twenty-Second General Assembly of the State of Tennessee* (Nashville: S. Nye and Co., 1837), 31.

[35] Ibid, 32.

In short order there appeared a fifth report (1839), with a special focus on iron in Cocke County. The first official geologic map of Tennessee accompanied the fifth report.[36] This color-coded map has two sections: one shows the state divided into different colored zones (figure 2), the other (figure 3) shows a cross-section, with the same colored zones, which functions as a key to the geologic divisions.[37] The narrative in Troost's sixth report (1841) employed the geologic classifications currently in use in Europe. In it he divides the general designation graywacke into sections labeled Cambrian and Silurian.[38]

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[36] Corgan has suggested that Matthew Rhea's 1832 map of Tennessee, which actually credits Dr. Troost, should be considered the first geological map of Tennessee, followed by Jacob Peck's map issued the following year. Clearly both men were influenced and informed by the work of Troost. Wilson believes that Troost's 1839 map actually accompanied the sixth report, which was issued in 1841. Wilson, 2. L.C. Glenn, in his history of Tennessee geological work, does not elaborate much on the fourth report, but states that Troost's map accompanied the fifth report. Glenn, 178. The Tennessee State Library and Archives has catalogued the map as having accompanied the fifth report. Corgan's detailed bibliography of Troost's publications also lists the map attached to the fifth report, which was delivered to the Legislature in 1839. Corgan, *Geology in Antebellum Tennessee*, 98-99.

[37] *Geological Map of the State of Tennessee* by G. Troost, Geologist of the State, P. S. Duval, Lith. Phila. 1839. Tennessee State Library and Archives.

[38] Wilson, 2.

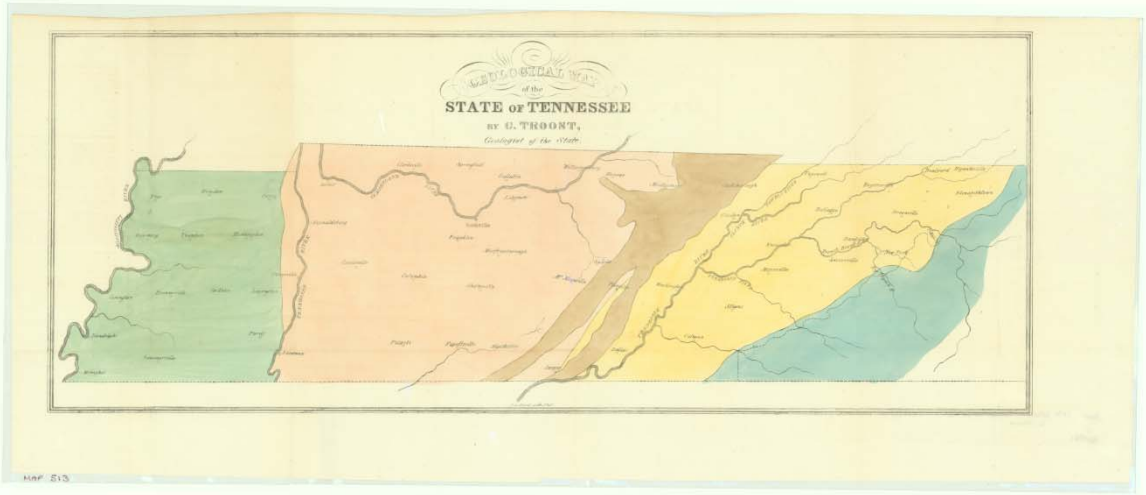

Figure 2. G. Troost, *Geological Map of the State of Tennessee*, 1839. Courtesy Tennessee State Library and Archives.

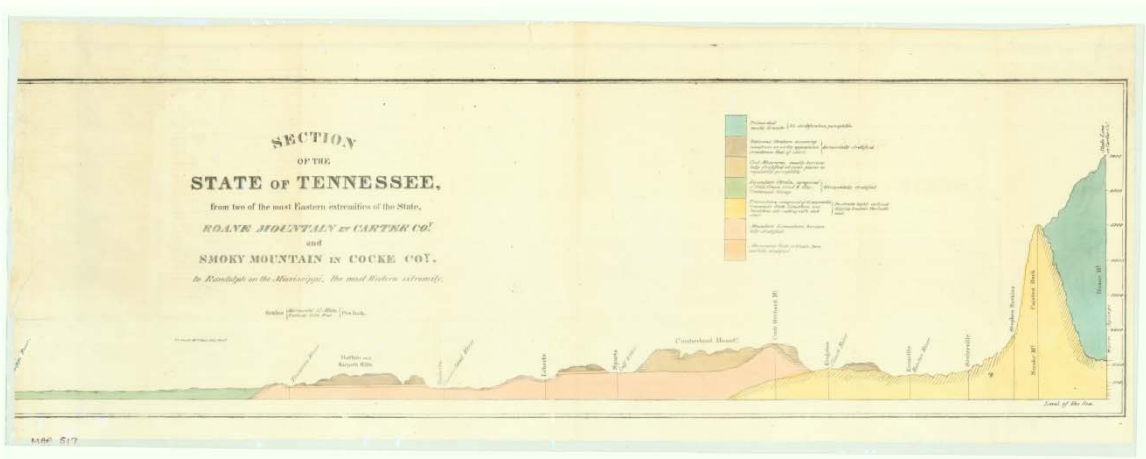

Figure 3. G. Troost, 1839, *Section of the State of Tennessee*. Courtesy Tennessee State Library and Archives.

Awareness of the work of Professor Troost can also be found in a pamphlet published in London in 1842 by an Englishman who had settled in the Tennessee valley south of Maryville in Blount County. James Gray Smith's pamphlet, "A Brief

Historical, Statistical, and Descriptive Review of East Tennessee, United States of America," referred readers directly to Troost's "Geological Survey of Tennessee," presumably the fourth report. Among the assets with which Smith hoped to convince immigrants of the agricultural, mining, and manufacturing advantages of East Tennessee, he included: "Marble, of great beauty and variety" noting that "an extensive set of works have been recently commenced near Rogersville, in Hawkins County."[39] Smith's pamphlet included a map, "*Map of East Tennessee Forming the Eastern Portion of Tennessee, One of the United States of America*," which showed no specific locations of any kind of minerals, with the exception of the word "limestone" near the town of Cleveland, between Knoxville and Chattanooga, Tennessee.

More than ten years later, James Safford, successor to Troost as State Geologist, reported in his first biennial report (1855) that his predecessor had been the first to call attention to the marble of Hawkins County, but added this caveat:

> It is probable that others in East Tennessee are entitled to the credit of having pointed out to the Doctor the location of this and other ranges. If so, we would like to be put in possession of the facts, in order that they may be incorporated hereafter with the rest in the history of marble operations in Tennessee.[40]

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[39] J. Gray Smith, *A Brief Historical and Descriptive Review of East Tennessee,United States of America* (London: J. Leath, 1842), 20. The map included with this pamphlet is entitled *Map of East Tennessee Forming the Eastern Portion of Tennessee, One of the United States of America* (London: J.R. Jobbins, Lithographer, 3 Warwick Court, Holborn, n.d.).

[40] James A. Safford, *Geological Reconnoissance of the State of Tennessee, being the author's First Biennial Report presented to the thirty-first general assembly of Tennessee, December 1855* (Nashville: G.C. Torbett & Co., 1856),107.

Apparently, no other facts of the matter emerged, as Safford's narrative history never changed and this version of the marble's "discovery" continued to be quoted by his successors well into the twentieth century.[41]

By the mid-nineteenth century, Tennessee marble had gained considerable notoriety. Orville Rice of Rogersville had donated two blocks of Hawkins County marble for use as "memorial stones" inside the Washington National Monument, which was still under construction.[42] The two blocks of Tennessee marble that had been sent to Washington, D.C. for the monument had attracted the notice of those in charge of the additions to the U.S. Capitol, which would soon result in contracts for its use in the interiors of the new wings.[43] Meanwhile, marble from Knoxville was being installed in the interiors of the Tennessee State Capitol in Nashville.

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[41] Charles H. Gordon, "The Marbles of Tennessee" [Extract (D) from Bulletin No. 2, 'Preliminary Papers on the Mineral Resources of Tennessee'] (Nashville: Tennessee Division of Geology, 1911); "History, Occurrence and Distribution of the Marbles of East Tennessee," *Marble Deposits of East Tennessee* [Bulletin 28] (Nashville: Tennessee Division of Geology, 1924).

[42] The monument was originally proposed by the Washington National Monument Society, a group of private citizens who hoped to accomplish what they saw the federal government as having failed to do: erect a permanent place at which to honor the first president. After the Civil War, the United States Government completed the monument and took over its ownership.

[43] Advertisements for marble to be used in the exterior portions of the U.S. Capitol Extensions appeared in 1851; notices soliciting bids for interior marble were first published in 1853.

Tennessee Marble: A Social Construction?

Its growing national reputation notwithstanding, however, it appears that Tennessee marble may have been something of a fiction. In strict geologic terms, the vividly colored rock noted by early visitors is in fact densely compacted limestone, pigmented by various minerals. Perhaps, in the mid-nineteenth century, natural scientists, architects, and engineers were not yet aware that the distinction between marble and limestone was one of metamorphosed versus non-metamorphosed stone.[44]

Even today, while geologists and stone conservators go to great pains to make that distinction, and some architects and builders may recognize that Tennessee marble may not be fully metamorphosed from the limestone state, the distinction is mostly ignored. Tennessee marble continues to be selected as a premium dimensional building material by architects and builders, and stone contractors and dealers continue to retain the "marble" designation with its positive associations. The variously colored stones are a top-ranked choice for decorative architectural interiors, while the off-white (pink) Tennessee dimensional stone often serves as an alternative to white marble for exterior use. Due to its superior durability, resistance to water absorption and staining, and tensile strength,

[44] Metamorphism is a term of geology, which is defined by *The American Heritage Dictionary of the English Language*, Third Edition (1992) as: "the process by which rocks are altered in composition, texture, or internal structure by extreme heat, pressure, and the introduction of new chemical substances."

Tennessee "marble" is often preferred to actual marble or to granite by architects and engineers.

That it has enjoyed such a long and distinguished history and that it is still called marble today prompts the question of when, and in what contexts, the geological distinction was made. How much, if at all, did or does it matter? To aid consideration of the issue: whether and how the term marble might have been used to further Tennessee's social and economic status, I will briefly outline the history of Tennessee marble usage and summarize the evolution of geological thinking within the state.

A Very Beautiful Native Porphyry

Whether chosen for color, for durability, or because of its obvious availability, Tennessee marble is documented to have been in use by at least the late eighteenth century.[45] A fine recommendation of its durability is the fact it was employed as a dimensional (exterior) building stone for a 1797 dwelling still standing in Tennessee (figure 4). For his two story federal-style home near Knoxville, Francis Alexander Ramsey—or Thomas Hope, the architect he had brought up from Charleston, South Carolina—chose blocks of rough hewn dark pink marble, with keystones and courses of blue limestone. These stones, probably found

[45]Stuart W. Maher and Joe P. Walters, "The Marble Industry of Tennessee," *State of Tennessee Department of Conservation and Commerce, Division of Geology, Information Circular No. 9* (Nashville: 1960), 1.

bedded together, were likely visible in outcroppings nearby in the banks of confluence of the Holston and French Broad Rivers. Even though Hope is believed to have designed other houses in the area while he lived on the Ramsey place, none other known examples were constructed of marble.

Ramsey, a surveyor, had come down from Pennsylvania in 1783 with James White (the founder of Knoxville) to explore the East Tennessee region. He settled first in the area of Little Limestone Creek near Greeneville. After acquiring land holdings of about 2000 acres, he moved his family further south, near the settlement that was to be Knoxville, where he was to serve as Clerk of the Superior Court for the Southwest Territory under William Blount.[46] Originally called Swan Pond, now known as the Ramsey House, this handsome structure is on the National Register of Historic Places. Surprisingly, it is the only known early marble building in the state, although limestone was used in two contemporaneous examples built by similarly prominent settlers along the Cumberland River in Middle Tennessee. These equally early and impressive stone dwellings, both located in Sumner County, are James Winchester's Cragfont and Daniel Smith's Rock Castle.

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[46] Charles H. Faulkner, "An Early Scotch-Irish Family: The Ramsey House Archaeological Project," *The Journal of East Tennessee History*, 77 supp. (2006), 59-60.

Figure 4. Ramsey House, or Swan Pond, 1797, Knox County, Tennessee.

As a decorative interior stone, Tennessee's highly figured or "variegated" marble first became known for its use in prominent public buildings of the mid-nineteenth century. The interior stairs, columns, and furnishings of William Strickland's elegant Greek Revival-style Tennessee State Capitol (1845-1859) incorporated several different shades of marble from Knox County to advantage. The building attracted the notice of Frederick Law Olmsted on a journey through Nashville by river in 1854. He described the structure as "built of smooth-cut blue limestone, both within and without" noting, "ornamenting its chambers are columns of a very beautiful native porphyry, fine white grains in a chocolate ground." [47]

[47] Frederick Law Olmsted, *A Journey Through Texas: Or, a Saddle-trip on the*

The brownish-red stone used in the Tennessee State Capitol for the grand staircase, as well as columns and various furnishings, contains very visible fossil forms that appear as decorative white patterning. In his first geological report (1855), Safford called this stone "variegated fossiliferous marble":

> This, which may be called *par excellence* the marble of East Tennessee, is a highly fossiliferous and calcareous rock. It has, in its polished condition, a bright ground of brownish red colors, which are more or less freely mottled with white and gray fleecy clouds and spots. In that of the first quality, these clouds and spots are distinct and well defined, showing, at the same time, little of their fossiliferous nature. The brownish-red color of the ground varies, having at some points a darker shade than others. We prefer the lighter ground. Other secondary qualities, though often beautiful marbles, have not as well-defined clouds, etc., and their fossiliferous portions shows too distinctly their organic structure. Some, however, might prefer to see the latter character.[48]

The Tennessee marble industry prospered and grew exponentially throughout Safford's term in office, which extended from 1854 to the end of the century. During his tenure, the United States Capitol acquired marble from Hawkins County for three of four grand staircases in the wings being added for the House and Senate.[49] Perhaps it was the prestigious association with the seat of power in Washington, or the fact that the range of color and pattern in Tennessee marbles appealed to Victorian taste, but Tennessee's marble spawned a booming industry in

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Southwestern Frontier (New York: Dix, Edwards & Company, 1857), 35-36.

[48] Safford, 105.

[49] This reddish-brown, highly fossilized marble, of a color referred to as "cedar" by the industry today, was obtained from a quarry just south of Rogersville for use in three of the four highly visible grand staircases leading to the House and Senate chambers. The fourth staircase is white Italian marble.

the decades to follow. Entrepreneurial capitalists of Knox and Blount counties drove market expansion, however, not the marble men of Hawkins County who had first come to Troost's attention in the 1830s.

One of the critical factors in the advancement of the industry in Knoxville and environs may have been the earlier completion of railroads into the area. By 1854, the distance from Dalton, Georgia, to the Tennessee River at Loudon (then known as Blair's Ferry) was fully tracked by the East Tennessee and Georgia Railroad. Upon completion of the railroad bridge across the Tennessee River at Loudon, the line from Knoxville to Dalton, connecting through Georgia to the Atlantic coast ports, was opened to great fanfare in June 1855. Meanwhile the lines of the East Tennessee & Virginia were under construction, simultaneously, from Knoxville and Bristol. When they joined near Greeneville in 1858, East Tennessee was at last connected by rail, through the valley of Virginia, to points north and east. The ET&G and the ET&V, which operated on the same gauge rails, provided the most direct route south for cargo (both raw materials and finished goods) moving in both directions. For the heavy marble, which had heretofore required being hauled to waterways and boated downstream to rail or road connections, the initiation of railroad service meant tremendous market expansion.

By the turn of the century, building stone from Knoxville could be found in major architectural projects along the "metropolitan corridor." Geographer and historian John Stilgoe has traced how the arrival of the railroads forged a new urban network of visible public spaces among the cities connected by rail. Many cities

welcomed new business, adapted existing industries to profit from access to rail transport, and built impressive edifices to serve a rail-riding public. They enjoyed a rise in status as a result.[50]

When these decades of prosperity and building construction ended with the Great Depression, the all-but-defunct marble industry was revived by orders of dimensional stone for the National Gallery of Art and the new federal post office in Knoxville. There was also a demand for interior decorative stone for the new federal post offices for Nashville, whose interior marble came from Knoxville, and Rogersville, where the pink Tennessee marble floor was sourced locally. While the National Gallery was privately-endowed by Andrew Mellon and his Pittsburgh-based Foundation, the majority of buildings erected during this period were part of President Franklin Roosevelt's New Deal, which was intended not only to boost the local economy by providing opportunities for skilled workers and on the job training, but also to raise morale by contributing handsomely designed functional buildings to the local landscape.[51]

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[50] John R. Stilgoe, *Metropolitan Corridor: Railroads and the American Scene* (Yale University Press, 1983), 15. Stilgoe, geographer and professor of landscape architecture, has argued that railroads transformed the nation between 1880 and 1930, making visible the physical progress of cities along the route and prompting aspirations to greatness among those with direct service. He called particular attention to the image of handsome terminals at the end of the rail lines. Once impressive destinations in themselves, by the time this book was written they largely ignored by the car-driving public.

[51] Carroll Van West, *Tennessee's New Deal Landscape: A Guidebook* (Knoxville: University of Tennessee Press, 2001), 5, 15.

The demand for Tennessee marble did not end in the 1940s. Even though only a handful of quarries are open today (all operating under the auspices of the Tennessee Marble Company), Tennessee marble continues to be chosen for highly visible public projects. One reason for its enduring value as a prestige construction material is the long tradition of historical use in prominent public buildings. A selected list of notable examples from the past generation would include: exterior, East Building of the National Gallery of Art (I.M. Pei and Associates, Architects, 1976); exterior, Knoxville Museum of Art (Edward Larrabee Barnes, Architect, 1990); interior, U.S. Capitol Visitor's Center (Alan Hantman, Architect, 2008); and both exterior and interior, Howard H. Baker, Jr. Center for Public Policy, University of Tennessee (McCarty Holsapple McCarty, 2008).

In addition to the intermittent demand for Tennessee marble for such important and highly visible projects, there has also been a trend toward the use of composite stone made from marble dust mixed with concrete. A prominent recent example is the exterior veneer finish on Knoxville's East Tennessee History Center (Barber McMurry, 2005). Such a coating provides the appearance of marble for a building that adjoins Alfred Mullett's Knoxville Custom House and Post Office (1872), one of the first known structures to use sawn blocks of Tennessee marble as dimensional building stone.[52]

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[52] Waste marble was apparently being burned for lime by the 1910s. Since lime is also a prime ingredient in popular building materials such as cement, it is possible that as historical demand for the more expensive marble slowed from time to time, some of the stone was repurposed into cheaper materials.

But this easily achieved cosmetic appearance may not prove economical in the long term. Reasons for continuing to demand the real thing might include the fact that while Tennessee marble performs all of the essential functions of marble, it actually excels over the pure white marbles in many respects. It can withstand a great deal of pressure without cracking, it is densely grained, it absorbs very little water, and it is stain and odor resistant. Besides which, it comes in a variety of colors and patterns, can be highly decorative when polished, and has proven more resistant to weathering than sandstone, granite, and many limestones.[53]

Tennessee: A Leader in the Field

Given the historical importance and continuing strong reputation of the state's prestigious building stone, what is the position of Tennessee geologists on the question of naming it marble? Tennessee marble is still referred to by that name in state geological publications, even if it is now considered by most to be nothing more than a superior limestone. Today's Tennessee geologists can look back with pride upon the accomplishments of their predecessors. When state geologist A.H. Purdue, who had taken over the Third Geological Survey in 1912, called Tennessee "a leader in the field," he may well have been acknowledging the state's already

[53] According to results of two different tests reported by geologist C.H. Gordon in 1911, four Tennessee marbles from the Knoxville area had 13,000-17,000 pounds per cubic inch of crushing power; three others withstood 300,000 pounds pressure. Gordon, 1911, 21-22.

impressive roster of geological maps and publications. Purdue's immediate predecessor, George Ashley, had initiated a host of new initiatives and a series of bulletins, evidence of an era of definitive research on Tennessee geology. Purdue's editorial appeared in the same issue as a speech delivered at a recent meeting of the Southern Commercial Congress in Nashville, which suggests that he was continuing to tout the historical partnership of geology with scientific agriculture in Tennessee.[54]

Beginning in the antebellum period, when few colleges and universities in the South placed as much emphasis on the acquisition and application of scientific knowledge as they did on a "classical" education, there are indications that Tennessee aspired to a more practical approach with regard to its natural resources. Both the University of Nashville and Cumberland University provided some of the earliest instruction in the South in geology and combined it with field training. In the 1840s, state geologist Gerard Troost began to concentrate on the composition of soils with respect to agricultural production and became co-editor of a publication called "The Agriculturist."[55]

The curriculum planned by the founders of the University of the South at Sewanee, which was purposely created to rival the finest northern institutions, offered both classical education and scientific studies including agriculture,

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[54] A.H. Purdue, *The Resources of Tennessee,* II (Nashville: State of Tennessee Geological Survey, 1912), 220.

[55]Corgan, "Geology in Antebellum Tennessee,"50.

commerce, and mining.[56] When classes at the university (founded in 1860 but not opened prior to the Civil War) officially commenced in 1865, the school's science and engineering curricula were bolstered by the presence of several faculty members trained at West Point. Instructors Francis Shoup and Edmund Kirby Smith, both West Point graduates, were former confederate generals. The first Vice-Chancellor, Josiah Gorgas, who secured their appointments, was himself the former chief of confederate ordnance. He, of all people, was well aware of the need to provide a sound practical education for the next generation of southern men. Gorgas, who left Sewanee to lead the University of Alabama a few years later, remained a strong advocate for courses in chemistry, physics, and engineering.[57]

It is ironic that the University of Tennessee, which grew to become a leader in the field of scientific agriculture, came late to its pursuit. During the 1840s and 1850s there were few precedents at what was then East Tennessee University for the application of practical skills. Engineer Albert M. Lea, who had been trained at West Point and who helped lay out the modern streets of Knoxville, taught there in the 1840s. Lea's 1855 map (figure 5) is one of the first to show the new rail lines

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[56] Dan R. Frost *Thinking Confederates: Academia and the Idea of Progress in the New South* (Knoxville: University of Tennessee Press, 2000), 20.

[57] Ibid., 82.

entering the city.

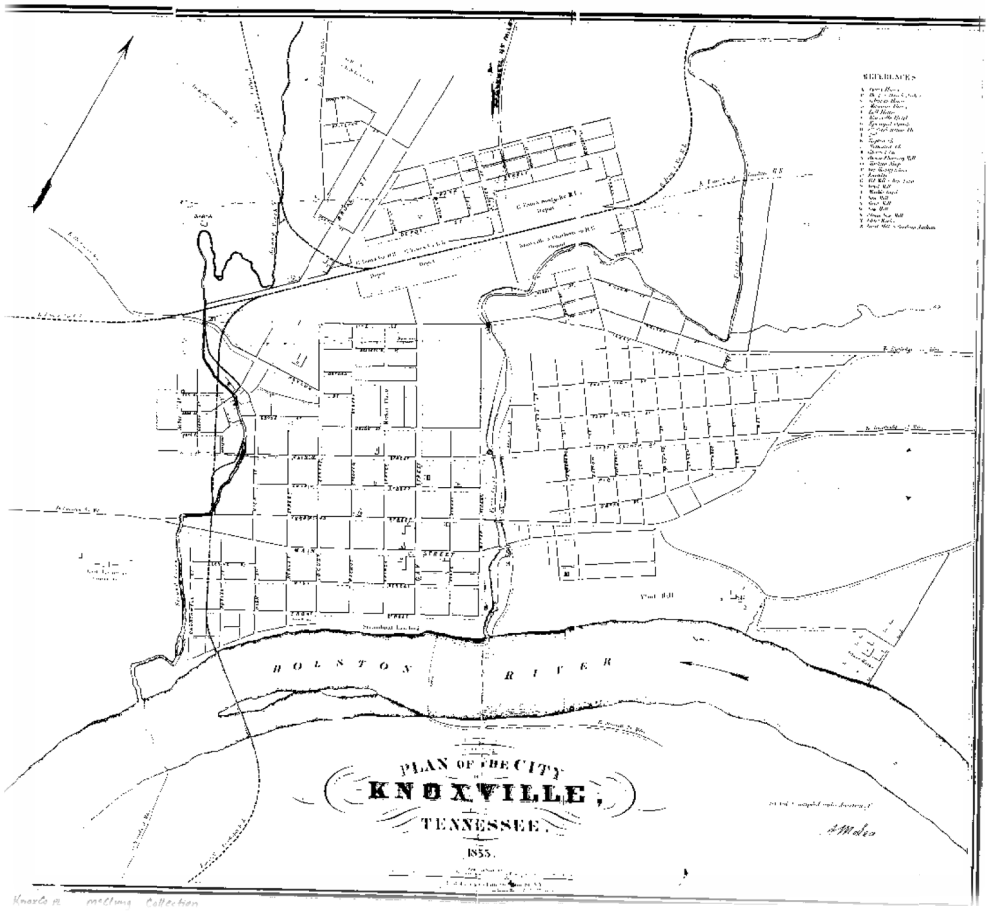

Figure 5. A.M. Lea, *Plan of the City of Knoxville*, *Tennessee,* 1855. Courtesy Knox County Public Library, McClung Historical Collection.

James B. Mitchell, who offered a course in mineralogy, was allowed time away to collect field specimens in the mid 1850s.[58] But, during and after the Civil War, university trustee-turned-president Thomas Humes, a staunch Unionist, continued to defend a curriculum based on the liberal arts model of classical

[58] James Riley Montgomery, Stanley J. Folmsbee, and Lee Seifert Greene, *To Foster Knowledge: A History of the University of Tennessee, 1794-1970.* (Knoxville: University of Tennessee Press, 1984), 54, 60.

education. He resisted the persuasive influence of trustee Oliver Perry Temple, one of Tennessee's most prominent early proponents of scientific agriculture. When the University was selected in 1867 to be Tennessee's land-grant institution as provided for under the Morrill Act, Temple got his wish for a more practical curriculum.[59] Temple was also influential in trying to recruit John W. McBryde, the South Carolinian who had established the university's new agricultural college curriculum in the late 1860s, to assume the presidency of the University of Tennessee upon Humes's departure.

Although the university failed to lure McBryde back to Tennessee, Temple's aspirations for a reorganization along more progressive agricultural and engineering lines were fulfilled in the appointment of Charles W. Dabney, who arrived in 1887. Dabney, who had been a professor of chemistry, mineralogy, and geology at colleges in Virginia and North Carolina, had directed North Carolina's agricultural experiment station before coming to Tennessee. Historian Dan R. Frost has singled him out as a leading member of a post-bellum generation that recognized scientific agriculture and industrialization as critical to rebuilding the war-ravaged southern economy.[60] Dabney was concerned that the South was too dependent on scientific and engineering expertise imported from the North and determined to provide " … institutes for the education … of the future scientific agriculturist, the mining engineer and metallurgist, the mechanical engineer, and

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[59] Ibid., 74.

[60] Frost, 110.

the manufacturer of our country."[61] Dabney reorganized the undergraduate program of the university into the College of Agriculture, Mechanic Arts and Sciences, offering courses in agriculture, civil engineering, mechanical engineering, chemistry, and mining engineering, with languages, literature, and other liberal arts courses as supplementary. He also contributed both practical skills and academic vision to his new home state. A 1896 map entitled "A Preliminary Agricultural Map of Tennessee…" lists Charles W. Dabney, Jr. as President of Tennessee's agricultural experiment station.[62]

There are indications that other Tennesseans subscribed to those same beliefs in the decades before Dabney's arrival. One of them was Joseph Buckner Killebrew, agricultural editor for the Nashville *Union and American* newspaper, who was appointed Secretary and then Commissioner for the state's Bureau of Agriculture. After the bureau's creation in 1871, Killebrew spent two years overseeing the state's timber and mineral lands.[63] He also worked closely with State

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[61] Montgomery, Folmsbee, Greene, 139.

[62] "A Preliminary Agricultural Map of Tennessee: Based on the Distribution of Geological Formations Compiled From the Most Recent Data Under the Auspices of the Tennessee Agricultural Experiment Station" (Baltimore: A. Hoen, 1896), Tennessee State Library and Archives, catalogued as Map 538. This map is the first Tennessee map to reflect the presence of the United States Geological Survey in East Tennessee, acknowledging the Survey's geological contributions for that section of the state, while still relying on Safford for the geology of Middle Tennessee.

[63] Connie Lester, "Joseph Buckner Killebrew," in *Tennessee Encyclopedia of History and Culture,* Carroll Van West, ed. (Nashville: Tennessee Historical Society, 1998), 502.

Geologist James Safford, who served as a consulting chemist to the bureau during a period of hiatus from the Tennessee Geological Survey.[64]

The arrival of fieldwork geologists from the United States Geological Survey in the 1890s helped sway the direction of the field from scientific research to "Economic Geology."[65] S.F. Emmons, who oversaw fieldwork on metallic minerals, noted in introductory remarks for research published in 1903 that the term "Economic Geology" would henceforth be used for what had formerly been called Mining Geology. C. W. Hayes, the other geologist in charge of the minerals survey, had been in Tennessee previously. He had written reports on the coal and iron resources of both Chattanooga and Sewanee in the 1890s. In his introduction to the 1903 volume, which included both Tennessee and North Carolina field reports, Hayes explained: "The papers included are such only as have direct economic bearing, all questions of purely scientific interest being excluded."[66]

Tennessee geologists who succeeded Safford and Killebrew continued in the same vein, intent on promoting the state's geological resources for the economic betterment of the population. Some came from industry, others from academia.

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[64] L.C. Glenn, "The Growth of Our Knowledge of Tennessee Geology," *Resources of Tennessee II*, no. 5 (Nashville: The Geological Survey of Tennessee, 1912, 197. According to Glenn, no survey was maintained by the state from 1870-1880 and reports concerning mineral resources were issued during this period by the Bureau of Agriculture.

[65] United States Department of the Interior, U.S. Geological Survey, *Contributions to Economic Geology, 24* (Washington, D.C.: Government Printing Office, 1903), 16.

[66] Ibid., 9.

While the literature concerning the marble in Tennessee had always reflected both scientific and practical aspects, from this point forward there was a more pronounced emphasis on the latter.

This might be one reason why the term marble was then, and is still, used to describe the dimensional and ornamental stones of Tennessee. Even though today's geologists might parse Tennessee "marble" into a number of separate and distinguishable types of stone, such distinctions are likely lost on the general public. More than one contemporary geologist has attempted to moot the issue by raising the point that the word marble is not technically a geologic term. Petrologist Wayne Powell, a geologist at CUNY Brooklyn, makes clear on his website that the Holston Marble is not a metamorphic stone and therefore he does not consider it a true marble.[67] Although he might disagree with Powell on other matters, such as the identification of a particular bryozoan found in the Holston marble, University of Tennessee geologist Don Byerly concurs that Tennessee marble is not metamorphic and that the defining characteristic for a "true" marble is whether or not it has undergone metamorphosis.[68] State Geologist Ron Zurawski, in Nashville, and Peter

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[67] http://academic.brooklyn.cuny.edu/geology/powell/613webpage/NYCbuilding/TennesseeMarble/TennesseeMarble.htm [accessed 19 July 2010].

[68] Michael A. Gibson and Don Byerly, *Lessons From Limestone* (Knoxville: Southeastern Section, Geological Society of America, 2006), 23; email correspondence with the author, November 2009.

Lemiski, chief geologist in the Knoxville office of the Tennessee Division of Geology, are equally clear on the issue.[69]

Yet tests comparing the mineral content of Tennessee marble to other types of marble have shown it to match or exceed every measure of durability and solubility in stones classified as marble. Tennessee's "marble" possesses both higher density and less porosity than the beds of limestone surrounding it. There are suggestions in the historical literature that it may have undergone intense pressure during the folding of the Appalachian chain. Geologists have theorized that re-crystallization might have taken place by several different means: if not through metamorphosis from heat and pressure, then from chemical dissolution, and/or the replacement of fossil areas in the marble with crystallized limestone (aka marble). Can the unusual, even unique, characteristics of Tennessee marble be explained by either chemical changes or the intense pressure caused by the weight of sedimentary layers? Is it remotely possible that a few beds of the marble, perhaps those where it is found in close relation to older rock of the Appalachian chain near the border of North Carolina, or those where it occurs at greatest depth, as in the Asbury section of Knox County, near the confluence of the Holston and French Broad Rivers, actually *did* undergo some type of metamorphosis, while other marble areas occurring in shallower beds in the same Holston Formation did not?

A chronological examination of geologic reports might yield clues to the development of scientific thought on the issue. What might have been the reasoning

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[69] Dr. Ron Zurawski and Dr. Peter Lemiszki, personal interviews with the author, 2009.

for making the distinction between marble and limestone? Did scientific motivation change over time? When was the fact that Tennessee marble was not a "true" marble first noted? Is it possible that all Tennessee marbles are not equal—that some actually did undergo full or partial metamorphosis? Or could extreme pressure, from being at the bottom of a seabed growing more and more dense with decomposing calcareous matter, account for the marble's unusual density and durability? Is there any possibility that crystallization (the requisite characteristic of marble) might have occurred through chemical means only, without heat and pressure?

The historical literature contains a detectable thread of discussion on the issue of marble versus limestone among geologists, academics, and others interested in the state's natural resources. During the late nineteenth century nationally-prominent geologists continued to endorse Tennessee marble. Although the issue of marble vs. limestone was pretty well clarified by the first quarter of the twentieth century, both by Tennessee geologists and the outside experts who contributed to Tennessee's geological publications, there remained some who saw it differently.

CHAPTER II

THE SCIENCE OF STONE

In his *Fourth Report to the Tennessee State Legislature* (1837), Dr. Gerard Troost, professor of chemistry, mineralogy, and geology at the University of Nashville and State Geologist of Tennessee, indicated that marble is found in limestone formations, but he did not state whether he believed that marble was, in essence, limestone. Far from it, instead he made a point of touting the marble as something special and rare that might be a potential source of wealth for the region's inhabitants. In fact, he had done this so well, in his address to the Tennessee General Assembly of 1831, delivered several months prior to his appointment as State Geologist, it suggests that Troost, like many at the time, believed the purpose of geological research was identifying the practical wealth of mineral resources. James X. Corgan and Michael A. Gibson imply as much in their discussion of Troost's relationship with the General Assembly, which became more contentious as the latter's expectations grew.[1]

Troost's successor, James Safford, appointed in 1854, was charged with undertaking Tennessee's second geological survey, which was to be a more comprehensive examination of Tennessee's geologic resources. A native of Ohio, Safford earned a Master's degree from Ohio University in 1846. He spent two years

[1] James X. Corgan and Michael A. Gibson, "Geological Exploration in East Tennessee: Gerard Troost's Travels in 1834," *Tennessee Historical Quarterly* 54 (Nashville: Tennessee Historical Society, 1995), 141.

in Benjamin Silliman's laboratory at Yale University before coming to Lebanon, Tennessee, in 1848 to teach chemistry, natural history, and geology at Cumberland University.[2] His mentor, Silliman, a chemist and the first science professor at Yale University, had founded the *American Journal of Science.* Soon after his arrival in Tennessee, Safford's geological explorations began to attract such notice that he was an obvious choice as the next state geologist after Troost's death in 1850.

In Safford's first geological report, which was delivered to the General Assembly in 1855 and published in 1856, he stated that the marble of Tennessee was: "one of the chief ornaments of our own noble capitol, as it will be soon of the national capitol at Washington" and that he was pleased to be able to point out more "valuable beds, not hitherto noticed."[3] Further, he reported: "The principal species of marble in the State are the following: 'Variegated Fossiliferous; Grayish White Fossiliferous; Magnesian; Black; and the Breccia and Conglomerate Varieties.'"[4] While he referred to marble as a separate category from the large variety of limestones discussed in other sections, his descriptions of the two types of marble in East Tennessee indicate that he considered one and maybe both of them limestone. And that he found the more highly fossilized one to be a superior stone:

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[2] Charles W. Wilson, Jr., *State Geological Surveys and State Geologists of Tennessee: A History of the Development of the Division of Geology* (Bulletin 81) (Nashville: Tennessee State Division of Geology, Department of Conservation, 1981), 8.

[3] J.M. Safford, *A Geological Reconnoissance of the State of Tennessee*, *1856*, *being the author's First Biennial Report presented to the 31st General Assembly of Tennessee, December 1855* (Nashville: G.C. Torbett & Co., 1856), 103.

[4] Ibid., 104.

> In East Tennessee there are two distinct varieties of this marble. One is an argillaceous limestone, little fossiliferous, of dull, gray, brownish-red, and sometimes greenish colors, arranged in undefined banded clouds. It receives a smooth, good polish. Such marble has been quarried and worked to some extent in Roane, Meigs, etc. It was used in the construction of the foundation of the court-house in Kingston. The most important variety, however, and a superior marble, is that which is seen in the quarries of McMinn, Knox, and Hawkins. This, which may be called *par excellence* the marble of East Tennessee, is a highly fossiliferous and calcareous rock. It has, in its polished condition, a bright ground of brownish red colors, which are more or less freely mottled with white and gray fleecy clouds and spots.[5]

A geologic map (figure 6), which accompanied Safford's first report has marble quarries marked in several locations, in strata labeled IV, V, VI.

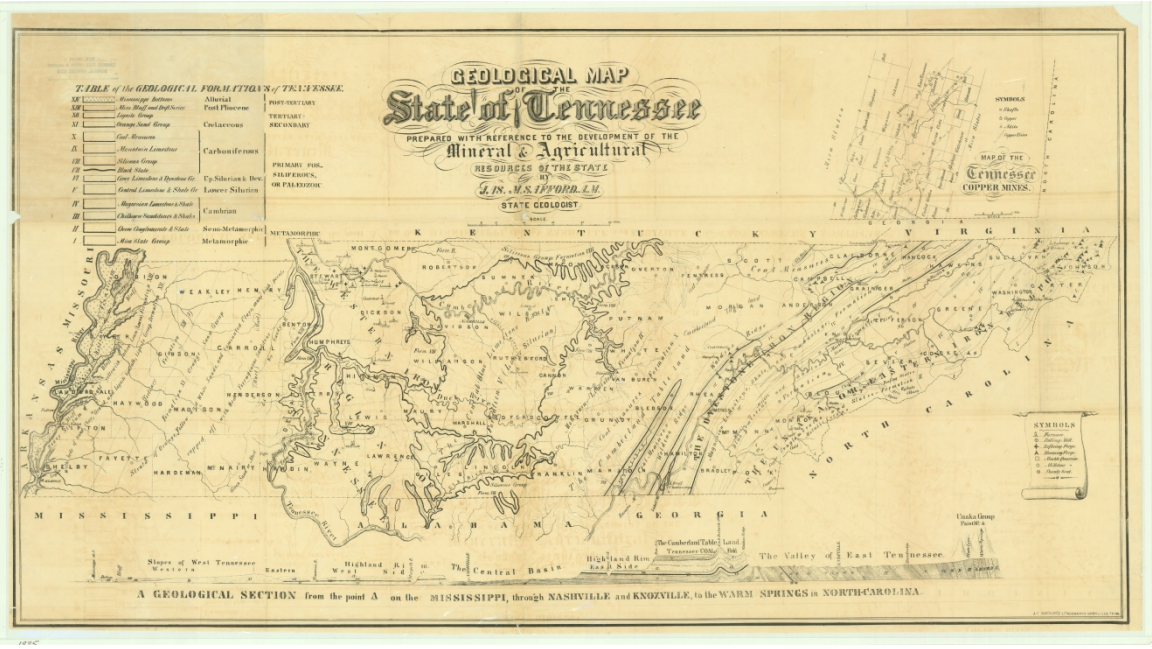

Figure 6. Jas. M. Safford. *Geological Map of the State of Tennessee Prepared with Reference to the Development of the Mineral & Agricultural Resources of the State*, 1855. Courtesy Tennessee State Library and Archives.

[5] Ibid.,105.

These strata run through the East Tennessee counties of Blount, Grainger, Hawkins, Knox and McMinn. Safford's geologic scheme for the map ranked the strata from oldest to youngest, in roughly parallel bands from east to west: I-II Metamorphic and Semi-Metamorphic; III-IV Cambrian, Primary Fossiliferous or Paleozoic era; V Lower Silurian, Primary Fossiliferous or Paleozoic era; VI Upper Silurian-Devonian, Primary Fossiliferous or Paleozoic era; VII-X Carboniferous, Primary Fossiliferous or Paleozoic era; XI Cretaceous, Secondary era; XII Tertiary era; XIII-XIV Post-Tertiary era. He indicated the largest mass of marble in the vicinity of Knoxville in strata IV, a category subtitled "Magnesian Limestone and Shale." In the Hawkins County area to the north and east of Knox County, it is not entirely clear where strata IV ends and strata V, "Central Limestone and Shale," begins. Strata IV and V appear next to one another and occur in parallel bands roughly south to north, from border to border of Tennessee. Safford also indicated marble in West Tennessee, in Benton County, where marble is shown in strata VI, "Gray Limestone and Dyestone," near the Tennessee River. Very generally, the strata Safford labeled as IV and V comprise what geologists today refer to as Upper Cambrian to Upper Ordivician, with the marble occurring in the Lower Ordivician and Middle Ordovician phases. This is what is known today as the "Holston formation," a densely compact limestone composed of coarsely crystalline calcite with greater or lesser amounts of fossils appearing as white figures, labeled on contemporary geologic maps as *Oho*.[6] Today's

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[6]Martin S. Kohl and Peter K. Lemiszki "Stratigraphic Columns and Geologic Cross Section for the Camelot Quadrangle" Tennessee Division of Geology USGS STATEMAP Project (Nashville: Tennessee Department of Environment and

scientists would also agree with Safford that minerals such as hematite are responsible for the reddish brown color of many of these stones.[7]

Did Safford publicly make a clear geologic distinction between marble and limestone? He stated clearly that the marble exhibited organic remains in the form of fossils, and that its composition was primarily calcareous, as is limestone. He probably also understood that some sort of metamorphic transformation would have had to occur to transform Tennessee's colorful, durable, highly polishable, limestone into a true marble. But he may have believed, as other knowledgeable scientists of the period seem to have done, that some form of metamorphosis or partial metamorphosis had occurred, from heat or pressure or both. More than likely, Safford and other geologists of his day took for granted that the dense and durable marbles of East Tennessee, which could be polished to a glassy shine, were actually different in physical structure, if not mineral content, from the layers of limestone in which they occurred.

Safford's published writings do not appear to contain speculation on whether or when structural transformation might have occurred, or whether he had

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Conservation, Division of Geology, 2003). Interim geologic maps of Tennessee also basically concurred with Safford, refining the picture to show the Holston formation occurring only within bands of the designation *Ochl*, which USGS Geologist Arthur Keith referred to as Chickamauga limestone in 1895 and which was for many decades called the Chickamauga Group of Limestone. R.C.Miller and S.W. Maher, *Generalized Geologic Map of Knox County With Mineral Resources, Mineral Industries, and Caves: Bulletin 70* (Nashville: Tennessee Division of Geology, 1973) map bound in report.

[7] Michael A. Gibson and Don Byerly, *Lessons from Limestone* (Knoxville: Geological Society of America, 2006), 21, 48, 68.

considered the possibility that this could have taken place through a chemical process rather than heat or pressure. It is possible that his thoughts on the matter may have been tangled up in sorting through the layers of geologic time, which were being actively reclassified in those years. Geologic historian James X. Corgan contends: "Safford's map is as modern as it could be in 1856" because there was as yet no established terminology. Corgan suggests, however, that Safford probably knew that, by indicating the occurrence of marble in both the Cambrian and Silurian phases and employing the terms "Paleozoic" and "Primary Fossiliferous" as equivalents, he was being purposely vague on the issue of whether these rocks could be considered at least partially metamorphosed.[8]

At the University of Nashville, Troost had mentored a young geologist named Richard Currey, who later taught at East Tennessee University. Upon Troost's death, Currey, who had earned an M.D., was one of the candidates for the post, along with Jacob Peck and James Safford.[9] In an 1857 publication entitled *A Sketch of the Geology of Tennessee,* Currey recognized Troost as his inspiration, along with his own pupils. Currey's summary of Tennessee geology stated: "the marbles belong to the limestone series, and differ according to their degree of purity."[10] He classified

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[8] Corgan, *Antebellum History*, 39.

[9] Ibid., 53.

[10] Richard O. Currey, *A Sketch of the Geology of Tennessee* (Knoxville: Kinsloe & Rice, 1857), 19. Coincidentally, one of the publishers of Currey's booklet was Charles A. Rice, for whom an Orville Rice, who was apparently a backer or co-signer, would later be assigned debts and assets related to Charles Rice's publications and book-binding establishment. I do not know whether the Orville Rice cited in the Knox County court

the magnesian limestone in the Knoxville area as highly suitable for building because of its hardness and compact nature, and he named both the "white variegated marble" found just east of Knoxville and the "reddish variegated marble" as examples of magnesian limestone.[11] Currey, who had accompanied Troost on his 1838 visit to Knoxville, noted that the Sloan quarry in Knoxville and the quarries in the Rogersville area were probably in the same stratum since the marbles they contained were "of the same character."[12] Currey, who was a resident of Knoxville when his book was published, tactfully suggested that the improved access to the railroad in the Rogersville area would soon boost that locality's market presence—a nod to the fact that Knoxville already possessed the beginnings of a fully developed industry.[13]

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transaction of 10 September 1858 was the father, brother, or some other relative. Hawkins County Census records for 1860 show an Orville Rice as a 67-year-old farmer owning $62,500 in real estate, and with a personal estate valued at $121,544.

[11] Ibid., 22-23.

[12] James Sloan, the Nashville stonemason who had received the contract to furnish the brown variegated marble to be used in the interior of the Tennessee State Capitol, either leased or caused the opening of a quarry in Knoxville circa 1852. The quarries of Hawkins County were furnishing variegated marble of the same general appearance for interior work on the United States Capitol Extensions about this same time.

[13] Currey, 24. I have been unable to determine exactly when the Rogersville spur off of the East Tennessee & Virginia line was completed across the Holton River, although the mainline railroad was completed in 1858. The Rogersville & Jefferson line was chartered that same year to build the spur from Bull's Gap to Rogersville. Hawkins County Historian Henry Price believes that the line may have been completed to just south of the Holston River but that the railroad bridge connecting the line to the city of Rogersville was not completed until sometime after the Civil War. The name Rogersville Junction, instead of Bulls Gap, and the spur line are both shown on a Civil War-era map.

Currey was also in close touch with local marble manufacturers. He reported that Professor M.W. Dickeson, of Philadelphia, had leased two different properties near Knoxville for the purpose of quarrying and manufacturing mantels and monuments from different types of variegated marble.[14] Currey also mentioned having created a geologic map, possibly as an accompaniment to his book.[15] He located the marble in bands of Upper Silurian age and may have been the first to suggest the extent of the marble beds, which he described as stretching from Carter County in upper East Tennessee to Hamilton County at the southern border of the state. This conclusion apparently resonated with U.S. Geological Survey field scientist Arthur E. Keith, author of the "Tennessee-North Carolina, Knoxville Sheet" (Washington, D.C., 1895) when he named the overall limestone stratum including

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East Tennessee, North of Loudon, 1864, Capt. O(rlando) E. Poe and W.L.B. Jenney,U.S.A, Tennessee State Library and Archives.

[14]Dickeson, who had come to the Knoxville area in 1855 at the behest of Tennessee and Virginia Mining Company, had published a geological report related to land owned by that company in November 1855, and another in May 1856 reporting on his own Dickeson Marble and Zinc Mining Company, which had been incorporated in Tennessee that same year. Copies of both pamphlets can be found in the McClung Historical Collection, Knox County Public Library. Deeds showing Dickeson's land agreements for the latter can be found in the Knox County Archives, U, v. 2, 276-277 James M. Welcker to Montroville W. Dickinson (sic) 1 February 1856; U, v. 2, John Wrinkle to Montroville W. Dickinson (sic) 9 February 1856. While no company name appears on these deeds, M.W. Dickeson, M.D., John W. Tilford, and George R. Hazwell incorporated the Dickeson Marble and Zinc Mining Manufacturing Company before the Tennessee General Assembly in Nashville on 21 February 1856.

[15] Corgan reproduced this map in *Antebellum History of Tennessee Geology*, 41. He stated that Currey's map, which was published before Safford's 1856 map, was one of the first to use modern geologic language in Tennessee.

the marble the "Chickamauga Limestone."[16] This reference, which would have called to mind the newly-designated Civil War battlefield park of the same name, would have anchored the strata to a location in the vicinity of the southeast Tennessee, northwest Georgia border.

Currey's report is particularly valuable for the anecdotal information it contains, for this early source precedes Knoxville's first city directory. He noted that James Sloan, whose Knoxville company was called Aetna Mining and Manufacturing, was "freighting" marble in rough blocks to Nashville, and that a Mr. Schmidt, a Knoxville maker of "mantles, slabs, and monuments" had won a prize at an exhibition sponsored by the East Tennessee Agricultural Society.[17]

A few years after Currey's publication, State Geologist James Safford lost his post. Safford was a professed Whig. As political allegiances began to shift in the General Assembly in late 1850s, the post of state geologist was abolished. Advocates who saw the value of "agricultural geology"—promoting mineral resources as agricultural commodities—apparently prevailed, however, in funding several of Safford's reports to be published on the eve of the Civil War.[18] Civil War maps of Tennessee, created by the Federal Corps of Engineers, credit Safford.[19] No doubt the

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[16] Corgan, 26.

[17] Ibid., 27.

[18] Ibid., 56.

[19] Orlando M. Poe, *East Tennessee North of Loudon, 1864.* Prepared under the direction of Capt. O.M. Poe, Corp of Engs & Chief Mil Div of the Mississippi. From

federal engineers who began arriving in 1862 found his recently published maps useful. After the war, he was reappointed both to the post of State Geologist and to his professorship at Cumberland University.[20]

As the second phase of his academic career got underway, Safford returned to his geologic research. By 1869, in his comprehensive *Geology of Tennessee*, which was also accompanied by a map, Safford was a bit more specific in describing the lithology.[21] In a section headed "The Red and Gray Marble," he identified all of the marbles are part of one large—if broken in places—belt of marble: "This bed is one of great interest on account of the valuable marble for ornamental and building purposes, it can supply … the bed is, in general, a variegated crinoidal and coralline limestone." [22] He indicated that the bed was limestone, that it contained fossils of both animal and vegetal origin, and that valuable marble could be found within the bed of limestone--but all of this under the heading marble. Safford's 1869 map (figure 7) also showed a more sophisticated geological classification system than that of 1855.

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data furnished by Capt. O.M. Poe and Professor J. M. Safford. S. Geismar, Lith. Collection Tennessee State Library and Archives.

[20] Safford was also hired to teach chemistry in the medical department of the University of Nashville in 1873, and then at Vanderbilt University when the medical schools were combined in 1874. He worked in that capacity from 1874-1894, assuming the post of Dean, Department of Pharmacy for several years beginning in 1885. Wilson, 8.

[21] James M. Safford, *Geology of Tennessee* (Nashville: S.C. Mercer, Printer to the State, 1869). J.M. Safford, *Geological Map of Tennessee,* Tennessee State Library and Archives.

[22] Ibid., 236.

Figure 7. J. M. Safford, *Geological Map of Tennessee*, 1869. Courtesy Tennessee State Library and Archives.

"Marble" as a label was nowhere to be found, and the areas in which it had been previously noted were designated as Lower Silurian. In the report's written text, however, Safford referred to marble as if it were a singular material: "Marble of much the same quality is found at the mouth of the French Broad River… or Hawkins County, which has, so far, supplied the most desirable marble from this formation…"[23] In a later section of the same report, in a chapter entitled "Marble," Safford began:

> Great interest and importance is attached to the marble of Tennessee. It is now, in the columns and balustrades which, within, adorn the building, one of the chief ornaments of our own noble Capitol, as it is also and in a much greater degree, of the National Capitol, at Washington.

[23]Ibid., 237.

Immediately thereafter, he added this footnote: "A marble may be defined to be a durable limestone, pure or impure, susceptible of a good polish, and presenting a pleasing appearance when polished." [24]

Safford was taking the broad view. Even though he had clearly designated it as limestone on the map, he wanted to make certain that Tennessee's marble would continue to be accepted by its national "brand." By showing no marble *per se* on his map, he had done his scientific duty; by including the "may be defined" language, he hoped to ensure that the market for Tennessee marble would not be affected by any change in terminology. Safford assumed readers would take his statement as fact without questioning *who* might have defined marble as such.

Safford's carefully crafted statement, sanctioned just a few years later by Joseph Buckner Killebrew, Tennessee's new Commissioner of Agriculture, and a model of New South boosterism, appeared at a moment when the marble industry was still in its infancy and may well have contributed to the era of phenomenal growth that followed. Following in Troost's footsteps, Safford had pursued an interest in agricultural geology. Given this fact and his earlier business-friendly political sympathies, Safford found himself in position to take a leading role in the state's post-war economic recovery. These circumstances would likely have compelled Safford to soft-pedal any reservations he harbored about Tennessee marble in relation to other types of marble. He produced reports in the 1870s and 1880s in conjunction with Killebrew, who advocated developing the "business" of

[24] Ibid., 506.

agriculture for post-bellum recovery.[25] To bolster the state's economy and status, Killebrew, who worked closely with the Nashville, Chattanooga & St. Louis railroad, promoted development of agricultural and mineral resources and the recruitment of skilled farm labor, particularly European immigrants.

Together Safford and Killebrew published several books, including two enormous volumes issued in 1874 as *The Resources of Tennessee*. The book described the state in every aspect: geography, climate, crops raised and potential, manufacturing, and labor requirements. Brimming with enthusiastic description, Killebrew and Safford's comprehensive county-by-county treatment sent a clear signal that post-war Tennessee invited progress and investment.[26] Chapter XVI of the first volume, entitled "Other Minerals," began with marble, claiming that Tennessee's marble had become nationally famous for its "variegated appearance and fine polishing qualities." The authors touted the many varieties to be found across Tennessee and continued to define the marble as "any limestone that takes a good polish."[27] Several paragraphs later, however, the authors mentioned the fact that when left unpolished, like the building stone used in the just-completed Knoxville custom house, the marble might be mistaken for "ordinary light-colored

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[25] Sam B. Smith, "Joseph Buckner Killebrew and the New South Movement in Tennessee" (Ph.D. diss., Vanderbilt University, 1962).

[26] J.B. Killebrew, *Introduction to the Resources of Tennessee* II: Prepared under the Direction of the Tennessee Bureau of Agriculture (Nashville: Tavel, Eastman & Howell, 1874).

[27] Ibid., 253.

uncrystallized limestone."[28] While most of the language in this section would have been comprehensible to non-technical readers, nowhere else did it suggest that crystallization was a quality that separated marble from limestone. There was little geological detail. In fact, the history of the marble industry in East Tennessee was relayed in a long quote from Safford's first report. The rest of the chapter appears to have been written to bear out the assertion that marble of many varieties could be found across the state. Much of the content was anecdotal, seemingly designed to impress readers with the recent progress of the industry, mostly around Knoxville.

In 1876, Safford and Killebrew co-authored a geology textbook for Tennessee school children. In it, Safford elaborated on his earlier definition, but now assigned responsibility for the choice of terminology to architects: "This (the Tennessee) marble is a granular and crystalline limestone usually, but any limestone that will take a good polish and will look well after it is polished, is termed a marble. Marble is an architectural rather than a geological term."[29]

It is difficult to tell from what he wrote whether Safford believed that the marble was a discrete type of limestone that had been transformed into marble from its ordinary state and therefore merited a unique designation, or whether he purposely intended to skirt the issue by stating that marble could be any limestone that polished to a smooth and glassy surface. Was there doubt in Safford's mind as

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[28] Ibid., 254.

[29] James M. Safford and J.B. Killebrew, *The Elementary Geology of Tennessee: Being Also An Introduction to Geology in General, Designed For the Schools of Tennessee.* (Nashville: Tavel, Eastman and Howell, 1876): 202-203.

to the correct geologic designation for Tennessee marble? We may never know, for by the time of his 1869 report the marble was such a valuable commodity for Tennessee that Safford may have felt it best to skirt the issue as much as possible.

Following the lead of Safford and Killebrew, others in the field continued to refer to Tennessee's marble with unbridled enthusiasm over the next several decades. In 1888, geologist and mining engineer Bailey Willis provided an enthusiastic endorsement that made no mention of limestone.[30] He wrote that the richly colored red and brown marbles in the vicinity of Rogersville were more valuable than the lighter pinks found in the Knoxville area on the same "red belt." Writing in the *School of Mines Quarterly*, Willis based his article, which included his own map, on fieldwork conducted in the Rogersville area following Safford's 1869 report. The year after his article was published Willis was appointed Director of the Appalachian region for the United States Geological Survey. His concerns in 1888 seem very much tied to economics. In fact, he suggested that investors willing to use more professional methods of mining could profit greatly in Hawkins County, implying that the quarries in that section were not as fully modernized as those in other sections of the country.[31]

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[30] Willis, who had trained in engineering at Columbia University, would later become Chief Geologist for the United States Geological Survey and Professor of Geology at Stanford University.

[31] Bailey Willis, "The Marble of Hawkins County, Tennessee," *School of Mines Quarterly*, IX (1888): 120.

In his 1892 annual report, the State Geologist of Arkansas, John C. Branner, quoted Safford on the history of the industry but based his observations on his own fieldwork. He described the marbles he saw around the Knoxville area during the summer of 1890 and seemed particularly interested in the shared geology of neighboring states Tennessee and Arkansas. According to his summary of Safford's 1869 *Geology of Tennessee*, there were two different red and gray marble beds interlayered with shale and limestone in the Knoxville area. One Branner described as a *fossiliferous marble* and the other as a *coralline marble*—both of which were, he implied, distinct from shale and limestone.[32]

Around this same time, the field of engineering was becoming a modern profession. The University of Tennessee, which had attained land grant college status in 1869, had developed departments of agricultural, scientific, and engineering studies as a means of helping the state recover from the ravages of war. Civil engineering was instituted as a separate course of study by 1877. In Tennessee, as elsewhere, the engineering profession was moving away from the sole province of gentlemen civil engineers trained at institutions like West Point to embrace mining and mechanical work, which connected it to entrepreneurs and company men. The development of university courses fostered an academic wing of the engineering profession, ultimately creating an elite group of engineers who could move into the public realm or into leadership positions in the corporate

[32] John C. Branner, "Annual Report of 1890," IV (Little Rock: Office of the Geological Survey of Arkansas,1892), 187.

world. This worked to the detriment of bootstraps aspirants, who might previously have advanced by experience and ingenuity alone. By 1887 the University of Tennessee had a separate school of engineering that quickly became the state's brain trust for advanced engineering solutions.[33]

As the field of architecture grew and more ambitious building projects were proposed, new solutions in terms of building materials and methods were needed. This lapped over into the realm of practical geology. When the fledgling Engineering Society at the University of Tennessee began publishing its own journal in 1894, one of the first articles was "Tennessee Marble as a Building Stone" by Charles Ferris. Ferris reported the results of a series of tests (crushing strength, absorption, fire resistance, and microscopic analysis of the physical structure) that had been performed by former UT Professor Samuel W. McCallie, Assistant State Geologist for Georgia. McCallie pronounced that one of his three slide samples showed no sign of fossils, only perfectly formed crystals, interlocked, with no vacant spaces between them.[34] What this suggests is that while some sections of the marble were composed of mixed crystalline and non-crystalline materials, other sections might in fact be wholly crystalline.

Ferris, who would become dean of the College of Engineering upon its creation in 1912, concluded that Tennessee marble in general was an excellent

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[33] David F. Noble, *America By Design: Science, Technology, and the Rise of Corporate Capitalism* (New York: Oxford University Press, 1977), 168.

[34] Charles Ferris, "Tennessee Marble as a Building Stone," *The University of Tennessee Scientific Magazine* I (1894): 22.

building stone and should be considered a competitor to granite. His opinion was bolstered by the facts that it had been shown to absorb less water and burn at higher temperatures than granite, and that it was more economical for the simple reason that, unlike the difficult to cut granite, it could easily be sawn into thin veneer sheets that could be used to cover cheaper stone or brick.[35] Ferris showed his bias as a booster of Knoxville quarries by pronouncing the highly colored marble of Hawkins County a poor choice for building because it was hard to obtain in block form without flaws, it was not completely crystalline, it would not weather evenly, and it was subject to "dries."[36] In contrast, he described the pink and gray marbles of Knox County as free from flaws, also noting that the price of marble "loaded on cars" had dropped with the opening of more quarries.[37] Quoting a price for marble ready to transport from Knox County may have been Ferris's way of calling attention to the fact that marble from the Hawkins County quarries was not as easily transportable since it still had to be hauled to the railroad.

An 1896 map issued by the Tennessee Agricultural Experiment Station, which combined Safford's survey of Middle Tennessee, W.J. McGee's survey of West Tennessee, and recent work by the U.S. Geological Survey in East Tennessee, under the name of the University of Tennessee's new president, Charles Dabney, did not

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[35] Ibid., 28.

[36] Ibid., 27. Killebrew and Safford defined the undesirable "dries" as "porous spongelike cavities." *Introduction to the Resources of Tennessee*, 254.

[37] Ibid.

specify any areas of marble. The locations where marble had been identified on previous maps were now attributed to the earlier Cambrian (rather than Silurian) period. They were labeled "Knox Dolomite" (magnesium limestone), "Knox Shale" (argillaceous calcareous limestone), and "Chilhowee," and "Knox Sandstone." By parsing previously-labeled marble areas into different types of stone, such as magnesium limestone, argillaceous (shaly) limestone, and sandstone, Tennessee geologists may have been attempting to create a class of limestone that could be marketed as a durable, marble-like building material. Portions of this map were updated by new findings of the U.S. Geological survey, whose scientists had decided that some of the East Tennessee strata were older than previously thought.[38] But any new insights suggested by this map were probably obscured by the almost concurrent publication of the United States Geological Survey's first folio for the Knoxville region.

The 1895 *Knoxville Folio*, part of the *National Atlas*, the USGS mapping project that created the first fifteen-minute quadrangle maps of United States, included accompanying text by USGS geologist Arthur Keith.[39] Keith's first heading under "Mineral Resources" is "Marble," in which he stated: "Marbles are found in great quantity in the Chickamauga limestone in nearly all of its occurrences." The accompanying map (figure 8) showed the designation "Chickamauga limestone," in light pink with the symbol *Sc.* Occurring within it and colored a distinctive dark red,

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[38] Glenn, 208.

[39] Texas A & M University's digital map portal contains a complete set of U.S. G.S. folios http://repository.tamu.edu/handle/1969.1/3016 [accessed 24 August 2010].

was "Holston Marble," labeled *Oh*. This was the first time either designation had been used.

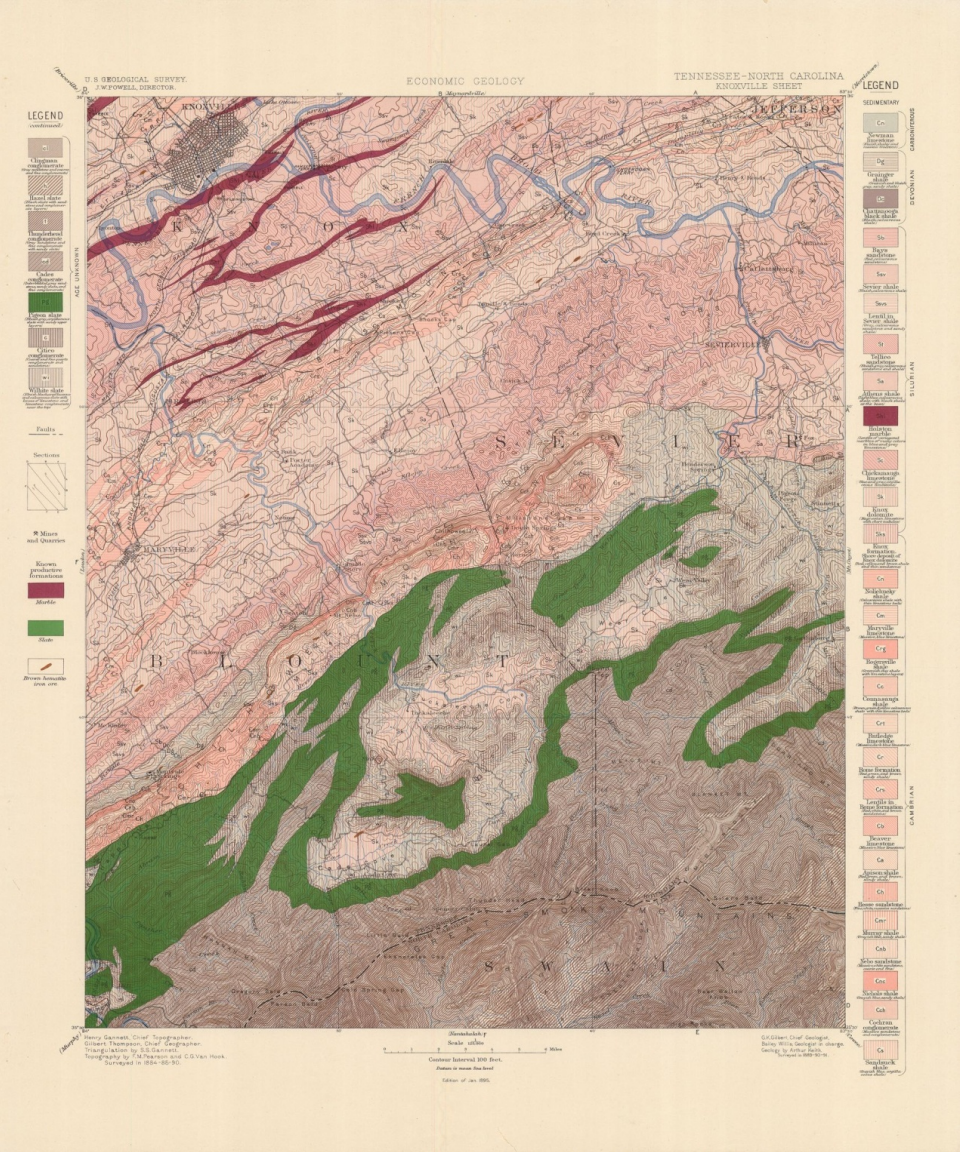

Figure 8. U.S. Geological Survey, J.W. Powell, Director; Bailey Willis, geologist-in-charge; Geology by Arthur Keith (surveyed 1889, 1890, 1891), *Economic Geology: Tennessee-North Carolina, Knoxville Sheet*, 1895.

Keith placed the Chickamauga limestone and the Holston marble in the Silurian strata, the same general location designated by Safford as "Lower Silurian" in 1869. Following the fossil research findings in geologist/paleontologist Charles D.

Walcott's 1891 USGS Bulletin, the Chilhowee limestone, south and east of Knoxville, was designated as Cambrian in age. Keith's Chickamauga limestone covered an extended area stretching down to the state's southern border intersecting with other known marble areas in western North Carolina and northern Georgia—its name an indication that, as Currey had done some forty years prior, Keith and others at USGS believed the formation covered a good portion of East Tennessee.

While Keith might have known that the marble was in fact limestone, he did not state it as such. Instead, he described, and mapped, distinct marble beds and marble belts. Contemporary geologic maps of Tennessee still do this, using Keith's "Holston" designation, although it is now called the Holston formation instead of Holston marble. Much of Keith's report was focused on the economics of mining and transporting the stone for commercial use. In field notes, he stated that although marble could be found throughout the nearby region, the Knoxville-area industry's impressive development was due in large part to the ready availability of transportation.[40]

Many geologic reports from this period, and on into the early twentieth century, cited G.P. Merrill's *Stones for Building and Decoration*, first published in 1891 and revised in 1897, as a definitive resource on Tennessee marble. Geologist George Perkins Merrill (1854-1929) studied geology at the University of Maine and at Johns Hopkins University. He began working at the United States National

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[40] Arthur Keith, *Tennessee-North Carolina, Knoxville Sheet* (Washington, D.C.: U.S. Geological Survey, 1895), 5-6.

Museum (now the Smithsonian Institution) in 1881 as an assistant curator. After earning his PhD from the University of Maine, he became the chief curator of geology for the museum in 1897. Merrill's *Stones* is based on his research for a handbook to the geologic collections at the National Museum and the similar, yet less complete, collection of the American Museum (of Natural History) in New York.[41] He cited a demand for a "comprehensive and not too technical" book on the subject and noted that he had emphasized stones found within the United States and organized the book into listings by state for easy reference.[42]

Although Merrill discussed marble throughout as if it were a distinct type of stone, the organization of his book, which included marble under "Limestones and Dolomites," made it clear that all marbles were types of limestone. He began the section with a global definition of limestone, in which he described the classification as enormously variable in every respect ("color, texture, structure, and origin") but one: that the mineral content must be primarily carbonate of lime.[43] Merrill reported that "dolomite" limestone, which often appeared as a pure white marble,

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[41] In order to house the Centennial exhibits presented to the U.S. Government at the Philadelphia exposition, the U.S. Congress appropriated funds in 1879 for the building of a National Museum under the auspices of the Smithsonian Institution. A collection of American stones collected by the U.S. Census bureau was one of the first sections to be organized for the new museum. "The Science of Stones," *The Washington Post*, 30 April 1881, p. 1.

[42] George P. Merrill, *Stones for Building and Decoration* (New York: John Wiley & Sons, 1891), iii-iv.

[43] Ibid., 78.

contained at least 45.65 per cent carbonate of magnesia, making it harder and less easily dissolved than other forms of limestone. He concluded:

> There is no essential difference between a limestone or dolomite and what is popularly called a marble, but for convenience sake the subject will be treated here in two parts…this class of rocks as are put upon the market as marbles, and…rocks of the same composition, but unfit for finer grades of building and ornamental work and known popularly as simply limestones.[44]

Merrill made clear that limestone strata occur in almost every geologic era, but that those stones most often used for building occur in the Cambrian, Silurian, Devonian, and Carboniferous layers.[45] Under the heading "Varieties of Limestone and Dolomite," Merrill designated only *crystalline limestone* ("a crystalline, granular aggregate of calcite crystals") as marble, commenting that the fine-grained white varieties used for statuary, called *sacchroidal*, looked like loaf sugar, from which one might infer that it was small-grained and easily worked.[46] Under *fossilferous limestone*, which Merrill defined as made up primarily of "fossil remains of marine animals," he placed "many of the most beautiful marbles…as, for instance, the red and white variegated Tennessee marbles." Merrill believed that this type of marble contained crystalline calcite as replacement for the fossils.[47] If crystalline calcite *is* "true" marble, would not the fact that it had replaced the fossils in certain of the Tennessee marbles render those stones, at least in part, marble?

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[44] Ibid., 83.

[45] Ibid., 79.

[46] Ibid., 80.

[47] Ibid., 81.

Throughout, Merrill made a number of references to Tennessee marble. He noted that there appeared to be "a continuation of the famous marbles of Eastern Tennessee" in Georgia's Whitfield County, that "colored marbles of fine quality equaling the variegated marbles of Tennessee" had been reportedly seen in Missouri, and that a "French gray" fossilized marble from upstate New York was being used almost as much as Tennessee marble for decorative interior work such as mantels and tabletops.[48] He also included an expansive section on Tennessee marble in which he reprinted a USGS map of the Knox and Blount County marble area (perhaps a preliminary version of the mapping of Arthur Keith and others) that had originally appeared in *Stone* magazine in November 1892. Merrill, clearly aware of Safford's work, cited Safford's notion that the East Tennessee marble beds, once continuous, had eroded into separate and discrete districts. But Merrill seemed to believe, as Safford never made clear, that the beds of marble had been formed by the heat and pressure that caused folding in the Appalachian mountains, and that that same heat and pressure produced the "crystalline structure and general metamorphism, whereby the stone assumed the physical qualities essential to its use for decorative work."[49] Even though Merrill had classified Tennessee marble as a limestone, his conclusions—that it did in fact have a crystalline structure and that it had undergone some sort of metamorphic transformation—were enough to ensure its favorable reputation as a desirable building stone.

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[48] Ibid, 91, 95, 99.

[49] Ibid., 103.

Ten years after Safford retired in 1899, the Tennessee General Assembly initiated the Third Geological Survey. Safford's successor, George H. Ashley, had earned a PhD in geology at Stanford University, by this time an important center of geological study, under the tutelage of J.C. Branner, former state geologist of Arkansas, who had written about Tennessee marble in 1892. Branner was well familiar with the Tennessee marble industry from his own work in Tennessee during the summer of 1890; Ashley had accompanied him on fieldwork in Arkansas from 1891 to 1893. An even more significant factor in Ashley's nomination might have been the fact that Ashley had worked with Vanderbilt University's L. C. Glenn surveying Tennessee's coalfields during the summers of 1901 to 1903.[50]

Industrial expansion was moving rapidly across the country, and coal and iron supplies, as well as raw materials such as phosphate, limestone, clay, and zinc, were of critical importance. Tennessee had all of these and the Third Geological Survey was intended to capitalize on Tennessee resources. As well, the railroads were in a period of consolidation and expansion. Geologists Glenn, at Vanderbilt, and Charles H. Gordon, who had come to the University of Tennessee in 1906, appealed to the State of Tennessee to undertake a modern geological survey that would improve upon the exploratory work of Troost and Safford. The rationale for a new survey was that documentation providing detailed descriptions and locations of Tennessee resources would be valuable for industries wishing to move into the

[50] Wilson, 10.

state.[51] The Tennessee State Legislature, under Governor Malcolm R. Patterson, passed an act creating the Third Geological Survey in May 1909. The bill specified that funding in the amount of $15,000 would be available in the years 1910 and 1911. The survey was to be:

1. a study of the geological formations of the State, with especial reference to their economic products
2. a study of…the soils of the State, with especial reference to their adaptability to particular crops
3. a study of road-making materials
4. a study of the underground water supplies
5. an investigation of the forests, streams, and water powers…with especial reference to their conservation and development for industrial enterprises
6. a study of the swamp and other nontillable lands, with reference to their reclamation for agricultural purposes
7. a study of the physical features of the state, with reference to their bearing upon occupations, physical welfare, and intellectual pursuits of the people.[52]

Tennessee's elected representatives were interested in making the most of the state's natural resources, but not just for immediate sale and exploitation by outside industry. They also wanted to use native materials wherever possible to save money and boost the local economy for Tennessee workers. These imperatives showed a desire to balance the utilization (and exploitation) of natural resources with sustainability, at least in the near term.

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[51] Ibid., 7.

[52] Public Acts of Tennessee, 1909, Chapter 549, Senate Bill 330:2008-2012, provided for the appointment of a state geologist, permitted cooperation with federal and state bureaus, and provided for publication and collection of exhibits of natural resources. A state geological commission was also appointed, which was to be composed of the governor, the commissioner of agriculture, the state mine inspector, and the presidents of the University of Tennessee, Vanderbilt University, and the University of the South.

It is tempting to read into this language an awareness of current national theories of conservation and the young state and national movements for the preservation and development of public lands. Yet the number one goal for the survey was a study of the state's geology "with especial reference to…economic products," which certainly implies industrial expansion. The section of the statute that dealt with forestry and waterpower, in particular, linked the terms conservation and development "for industrial enterprises"—suggesting that the two were seen as necessary partners for industrial progress, just as they had always been in scientific agriculture.

Beginning in 1910, it would be up to Ashley, a rising star in the profession, to carry out the wishes of the legislature. He had been recruited away from the United States Geological Survey as soon as the appropriated funds became available for Tennessee's Third Geological Survey.[53] Under Ashley's aegis, some of the most important scientific work on Tennessee geology was launched. His "Introduction" to the new version of *The Resources of Tennessee*, which was being revived as a serial bulletin, was subtitled: *A Brief Summary for the Homeseeker, Investor, Business Man, Farmer and Others*. Its title gives evidence of Ashley's smart and strategic approach. He intended to present the state's resources to "wide-awake manufacturers, miners, and capitalists all over the country" whom he hoped would consider the South a

[53] Wilson, 10.

gateway to the Panama Canal.[54] Significant for this study is that even in his short introductory essay Ashley included a prominent listing for marble, which he characterized as "highly suited" for interior use, varying in color from "cream, yellow, brown, chocolate and red, to pink or blue in endless varieties," and of "high chemical purity and high crushing strength and high resistance to absorption of water."[55] Although Ashley pointed out that the marble was widely known for interior use, his awareness of its strength and density suggests that he might also have recognized its value for exterior construction. On the title page, a stylized logo shows a train coming through a stone tunnel, with a crossed pick and wedge, marble derricks and blocks, and a valley landscape cut through by the bends of a river. Although its title suggests that the bulletin is statewide, this picture could easily be construed to represent the industrialization of East and Middle Tennessee.

The first comprehensive report on the Tennessee marble industry, published during Ashley's administration, included the same logo (figure 9). "The Marbles of Tennessee," by Charles H. Gordon, was a scientific study of the stone as well as a field survey of the industry that had grown up around it. Published in 1911, Gordon's definitive research was obviously intended to be part of the final survey document; it was subtitled "Extract (D) from Bulletin No. 2 'Preliminary Papers on the Mineral Resources of Tennessee.'"

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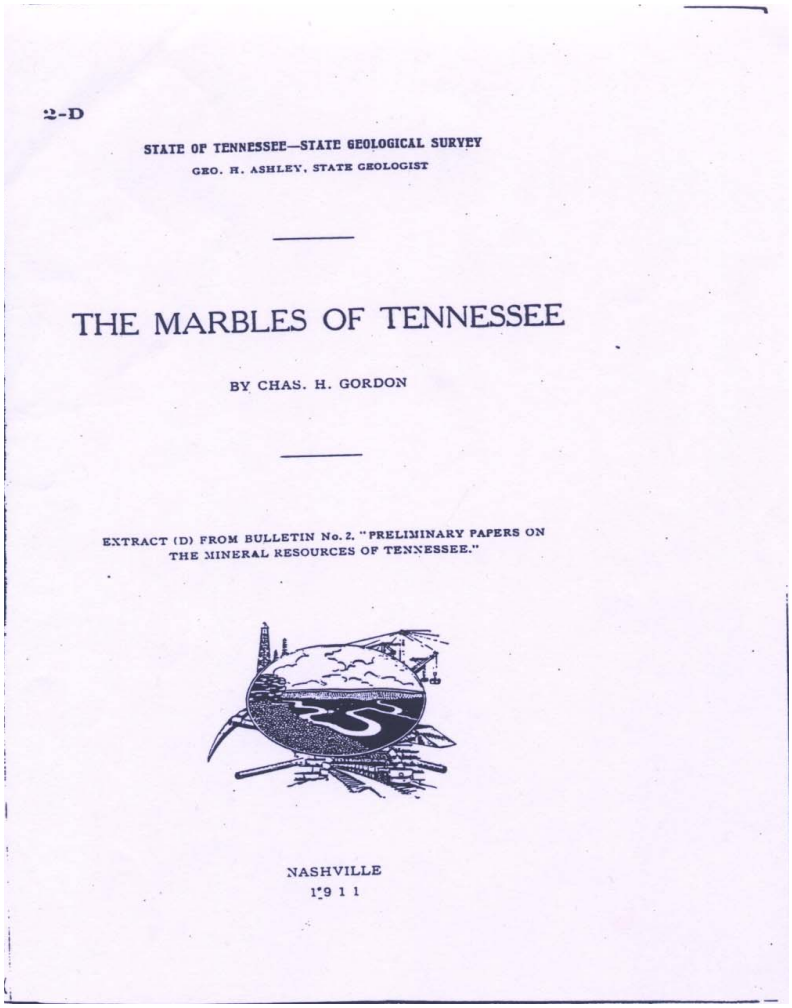
[54] George H. Ashley, *The Resources of Tennessee* [Bulletin 13] (Nashville: Tennessee State Geological Survey, 1911), 33.

[55] Ibid., 35.



2-D

STATE OF TENNESSEE—STATE GEOLOGICAL SURVEY
GEO. H. ASHLEY, STATE GEOLOGIST

THE MARBLES OF TENNESSEE

BY CHAS. H. GORDON

EXTRACT (D) FROM BULLETIN No. 2, "PRELIMINARY PAPERS ON THE MINERAL RESOURCES OF TENNESSEE."

NASHVILLE
1911

Figure 9. Logo, Tennessee State Geological Survey, 1911

Whereas Safford had long ago ascribed the practical definition of marble to architects, Gordon now suggested that "the building trades" considered the Tennessee stone marble. In 1911, he wrote: "In the trade the term marble is applied to any calcareous rock capable of taking a good polish, and which is suitable for ornamental work, or high-grade construction."[56] He proceeded to define types of

[56] Charles H. Gordon, "The Marbles of Tennessee," Extract [D], Bulletin II, *Preliminary Papers on the Mineral Resources of Tennessee* (Nashville: Tennessee

stone meeting the description marble as typically "crystalline limestones or dolomites," adding, "locally other deposits, such as breccias, conglomerates, and even serpentines, may furnish material suitable for ornamental construction." He concluded: "but, strictly speaking, not all of these can be considered marbles. A true marble is a granular aggregate of crystals of calcite or dolomite, chiefly the former."[57] This definition, clear and straightforward, did not touch on the issue of whether a "true marble" had also to be a metamorphosed stone. Gordon, who appeared convinced that crystallization was key to the identity of marble, described the "closely crystalline stratas" making up the Holston Marble. Neither did he seem concerned by the presence of fossils in Tennessee marble: "In the marble the form of the fossils is readily seen though they have been wholly recrystallized."[58]

Like Safford, Keith, and Merrill, Gordon might have been convinced that crystallization was proof enough of "true marble." Or, wanting to champion Tennessee's marble, he may have chosen not to elaborate further. In 1911, the

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Division of Geology, 1911), 5. Gordon's reference to the building industry is probably also a nod to the popularity of craftsman-style architecture (with its diverse revival styles and combinations of rustic, often local, materials) in America's new suburban neighborhoods. An early example of rustic craftsman construction is Glen Craig, a circa 1888 rustic Knoxville summer cottage built of rough blocks of Tennessee marble for John J. Craig III, owner of one of the most prominent marble films in the region. His Knoxville residence, Craiglen, modeled on an Italian town house, was designed in 1926 by architect Charles Barber to showcase interior Tennessee marble.

[57] Gordon repeated this wording in a later and much more extensive report entitled "History, Occurrence and Distribution of the Marbles of East Tennessee," in *Marble Deposits of East Tennessee*, Bulletin XXVIII (Nashville: Tennessee Division of Geology, 1924), 26.

[58] Ibid., 11.

industry was still in its ascendancy. The U.S. Geological Survey on Mineral Resources for 1908 listed Tennessee as third (behind the pure white marbles of Vermont and Georgia) in total value of marble produced, with Tennessee close behind Vermont in production of rough interior stone.

Ashley resigned in March 1912 to return to the U.S. Geological Survey. The Tennessee General Assembly, apparently pleased with progress under his tenure, continued the funding and named as successor A.H. Purdue. The former State Geologist of Arkansas and a professor at the University of Arkansas, Purdue had worked with Ashley on the U.S. Geological Survey. Purdue, noting the ongoing need for complete information on "coal, phosphate, iron, clay, slate, soil, marble" continued to carry out the Tennessee survey according to Ashley's plan.[59] In 1912, Purdue continued publication of *The Resources of Tennessee* as a monthly "devoted to the description, conservation and development of the resources of Tennessee." The May 1912 issue included a history of geological knowledge in Tennessee by L.C. Glenn.[60] Purdue's editorial called Tennessee a leader in the field.[61] The issue also featured an image of a marble tablet that had been presented at the opening of the 1912 Southern Commercial Congress in Nashville. In published remarks for that

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[59] Wilson, 15.

[60] L.C. Glenn, "The Growth of Our Knowledge of Tennessee Geology," in *The Resources of Tennessee,* II (Nashville: State of Tennessee State Geological Survey, 1912), 167-219.

[61] A.H. Purdue, *The Resources of Tennessee*, II (Nashville: State of Tennessee State Geological Survey, 1912), 220.

meeting, Purdue alluded to the purpose of the Congress: "development and conservation of the sources of wealth" in the South, stating that since "the two main sources of wealth are the soil on one hand and the mines and quarries on the other" it seemed appropriate that the Tennessee Geological Survey present this "slab of marble taken from our quarries."[62]

A.H. Purdue having died in office, Wilbur H. Nelson was appointed to the post of Tennessee State Geologist during World War I. Nelson, a graduate of Vanderbilt University, had been employed on the Tennessee Geological Survey for several years before earning a master's degree from Stanford University. Evidence that modern Tennesseans held professional field knowledge in high esteem can be found in the fact that Nelson also had ties to industry. He had worked for the Nashville, Chattanooga, and St. Louis Railway from 1914-16 and for a mining company until he assumed the office of State Geologist in 1918.[63] During the first years of Nelson's tenure, the Survey's focus was diverted to war interests in manganese, ball clay, pyrite, and other minerals. Tennessee workers in mines and metal processing plants were excused from military service so that production would not be interrupted.[64]

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[62] Ibid., 166.

[63] Wilson, 22. As David F. Noble has written about the field of engineering, the links between university departments and industry were relatively fluid in the early part of the twentieth century, and the State of Tennessee was obviously no exception in seeking up-and-coming geology professionals who understood the practical application of knowledge. David F. Noble, *America By Design: Science, Technology, and the Rise of Corporate Capitalism* (New York: Oxford University Press, 1977), 40-44.

[64] Wilson, 18-19.

No publications related to Tennessee marble were issued during the war years. The marble industry was in a hiatus with domestic construction at a standstill and few if any large-scale buildings underway.

In 1923, the General Assembly reorganized Tennessee's governmental bureaucracy once again. The Third Geological Survey was converted into the Division of Geology and moved into the Department of Education. Before he left office in 1925, Nelson authorized the publication of an extensive series of official bulletins numbered 20 to 36. *Bulletin 28*, entitled "The Marbles of Tennessee," combined an updated version of Gordon's study of marble locations, with a report by geologist T. Nelson Dale that included microscopic analysis of the Holston marbles, and a third section, on marble quarrying methods, by geologist Oliver Bowles. This volume remains the most complete treatment of the Tennessee industry. Included in *Bulletin 28* were two maps of active marble industry quarries: "Knoxville and Vicinity," created from fieldwork done from 1919 to 1921; and "Friendsville and Vicinity," mapped in 1921. These maps (figures 10 and 11) are extremely valuable because they show names and locations of a number of quarries.[65]

[65] Chapter IV of this dissertation contains a map created by overlaying these maps using Geographic Information System (GIS) software to show the location of these quarries in relation to both historical and contemporary transportation infrastructure.

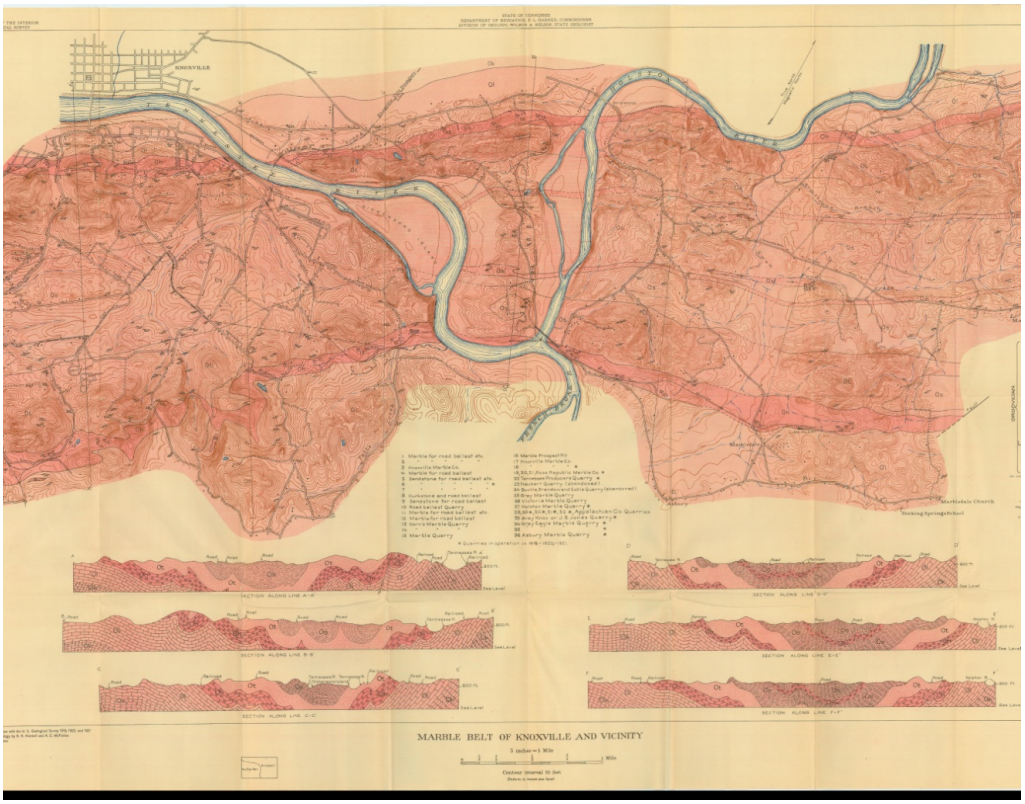

Figure 10. Charles Gordon, et al. *Marble Belt of Knoxville and Vicinity*, 1924.

Gordon's 1924 report was based substantially on that of 1911, with additional detail based on fieldwork that included interviews with some of the present quarry owners in Hawkins, Knox, and Blount Counties. His description of specific varieties of marble whose occurrence is noted on maps of quarry locations is yet the most informative single resource published on the Tennessee marble industry itself.[66] By way of introduction, Gordon praised Safford's 1869 report as "one of the classics of American geology" and referred to the U.S. Geological Survey

[66] In 1960 Stuart Maher and Joe P. Walters, using Gordon's list of quarry locations, re-surveyed them and updated the list in *Tennessee Division of Geology Information Circular 9*.

work done in East Tennessee during the 1890s as a pioneering accomplishment in mapping. He also mentioned that the two maps included with his report, which were created at a close topographic contour of twenty feet, were produced in recognition of the "commercial importance of the marble area" by the Tennessee Geological Survey, in partnership with the U.S. Geological Survey.[67]

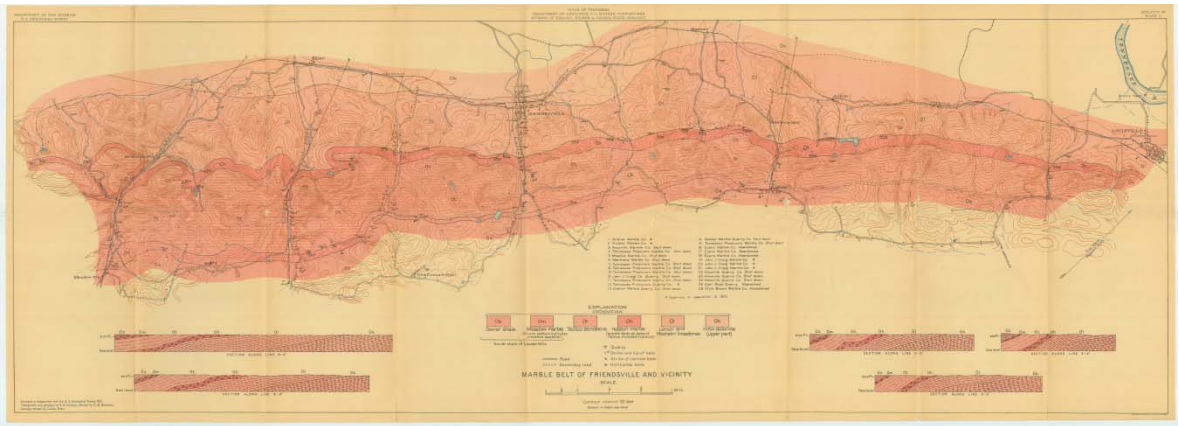

Figure 11. Charles Gordon, et al. *Marble Belt of Friendsville and Vicinity*, 1924.

Although Gordon stated clearly in both reports that marble is a type of limestone, neither in 1911 nor in 1924 did he make any explicit reference to metamorphic change as the defining characteristic that determines whether or not a stone was marble. In both reports, he wrote that what made limestones "suitable for use as marbles" was the "result of physical and chemical changes" they had undergone.

[67] Gordon, 1924, 33.

This implied some type of metamorphism, but he did not clarify further. Most limestones, he explained, originated as deposits of sediment on the bottom of the sea.[68] In the 1924 publication Gordon elaborated, describing Tennessee marbles as being composed of "comminuted" sea organism skeletons that had undergone pressure and partial re-crystallization.[69] This certainly implied that the marbles differed from limestone—at least somewhat—in physical structure.

The second paper in the 1924 *Bulletin* made an even more critical contribution to the limestone-marble dialogue. Its author, the prominent geologist, Thomas Nelson Dale, had published definitive reports on the granites of Maine and Vermont in 1907 and 1908. Dale, whose formal education consisted of early fieldwork in Germany and lectures on geology at Cambridge and Harvard, learned on the job with the U.S. Geological Survey, where he worked more than four decades. In 1892 he was assigned to compile geologic maps of the northeast region from his headquarters in Pittsfield, Massachusetts. He balanced this work with teaching responsibilities at Williams College until 1901. Over the span of his career, Dale authored more than twenty reports and became the *de facto* USGS expert on commercial building stone.[70] His seminal research on Vermont marble, entitled "The Commercial Marbles of Western Vermont" (1912), offered both the results of

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[68] Gordon, 1911, 5; Gordon, 1924, 26.

[69] Gordon, 1924, 26.

[70] Reinhard A. Wobus, "T.Nelson Dale: Diminutive Giant in Northeastern Geology," in *Williams College Geology Newsletter* II (Williamstown: Williams College, 1993), unpaginated.

scientific testing performed by others and an analysis of Dale's own studies of marble under the microscope. For Tennessee's *Bulletin 28* (1924), Dale's "Constitution and Adaptation of the Holston Marbles" cited the earlier U.S.G.S. *Bulletin 521* (his Vermont study) numerous times, for it contained many original conclusions about the content and structure of marble.

In the earlier report, Dale explained that he had used as few technical terms as possible and worked with samples of marble readily available from commercial quarries in order to make the information as useful as possible to the general public.[71] He had defined marble at the outset as a rock consisting mainly of crystalline particles of calcite or dolomite, or both.[72] He cited as an example the famous white marble of Lee, Massachusetts, a dolomite marble with a chemical composition nearly equal parts calcium carbonate and magnesium carbonate (the same chemical composition as the Knox Dolomite, or "magnesium limestone," designated on Dabney's 1896 map).[73] Dale also reported that his microscope observations of thin slices of various types of marble revealed that the crystals of calcite marble (as opposed to other stones containing similar amounts of calcium carbonate) had joined together or "twinned." Yet even after establishing this benchmark, Dale seemed to make a partial exception for certain granular limestones

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[71] T. Nelson Dale, *The Commercial Marbles of Western Vermont: Bulletin 521, United States Geological Survey* (Washington, D.C.: Government Printing Office, 1912), 10.

[72] Ibid., 12.

[73] Ibid., 13.

whose crystals polarized light but did not show the joined crystal structure. He suggested that these were "part-way" marble and that the proof was in the polishing—whereas ordinary limestone would not polish to a shine, stones that contained crystalline particles would exhibit a sparkling brilliance.[74] Dale's "part-way" marble definition may have been intended to apply to Tennessee marble, although he did not state it as such. He had referred to Tennessee marble directly in the 1912 Vermont Study:

> Some fossiliferous limestones that have not been subjected to a crustal movement great enough to destroy the outline of their fossils are yet crystalline and therefore marble…where the fossils have become crystalline we have to assume the percolation of acid waters dissolving the calcareous shells, etc., and then redepositing the lime thus taken up as crystalline calcite. This process has taken place…in all the crinoid or shell marbles of commerce, such as the Tennessee marbles.[75]

Yet even after explaining how crystalline marble might occur in limestone that had not undergone metamorphic pressure or heat, he still called the Tennessee stones "marbles of commerce." The Vermont study is also relevant to Tennessee marble in that Dale elaborated on the mineral content of colored marbles, discussing how different sequences of events: mechanical, organic, and chemical, produced the abundant variety of color in stones accepted as commercial marbles.[76]

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[74] Ibid., 11-12.

[75] Ibid., 22.

[76] Ibid., 44-45.

Dale's Tennessee report was based on fieldwork conducted in 1914, soon after his work in Vermont. In Tennessee, he took microscopic sections and also analyzed the mineral content of a number of marble samples. Some of the samples were collected by Oliver Bowles, of the United States Bureau of Mines, who accompanied Dale in 1914. Bowles's paper on quarrying technology, which was included as the third and final section of *Bulletin 28*, contained advice on how to recognize specific structural characteristics or indications of unsoundness that could cause problems in commercial use or during the quarrying process.

Tennessee Division of Geology *Bulletin 36*, "The Valley of East Tennessee," published in 1925, was a dissertation by Earl C. Case of the Ogden Graduate School of Science, University of Chicago. Examining the utilization of natural resources with regard to the specific geography of the great valley of East Tennessee, Case wrote primarily as a proponent of increased industrial and agricultural production. He was also a proto-conservationist. Encouraging more efficient use of the land and resources for farm and commercial use, he also favored setting aside the little-cultivated mountainous region bordering the Tennessee valley as public land.[77]

Case's short section on the marble industry named Tennessee "the second most important marble-producing state in the Union in 1924, Vermont ranking first and Georgia third." His figures, based on annual reports from the mining bureaus in

[77] Earl C. Case, "The Valley of East Tennessee: The Adjustment of Industry to Natural Environment" State of Tennessee, Department of Education, Division of Geology, *Bulletin 36* (Nashville: Williams, 1925), 12. A significant inclusion in the report is a bound-in map of the proposed Great Smoky Mountains National Park, dated 1925, which appears between pages 24 and 25.

each state, indicated that Tennessee also ranked second to Vermont in dollars paid for interior marble.[78]

Most of Case's observations came from an economic perspective. He cited the position of certain marble beds directly south of Knoxville as highly favorable because the marble sat at an easily reachable angle. In order for quarries to be profitable they must be near a railroad, so Knoxville, served by both the Southern and L&N railroads, had a distinct advantage over other Tennessee marble districts.[79] Case also mentioned cement as a product from the Knoxville area could derive considerable material benefit since the state was producing less cement than it was consuming.[80] He apparently did not see the inherent conflict in gathering limestone for cement in areas being quarried for marble and limestone. And the caption of his Plate XXVIIA, an unattributed photograph of a lime plant near Knoxville, stated that the plant was burning waste marble, which showed that marble was already being burned to produce industrial lime by this time.

In a 1930 University of Tennessee master's thesis entitled "Holston Marble at Asbury, Tennessee," James G. Walls identified Tennessee as the second largest marble-producing state in the United States. He declared that his purpose in writing was to update the work of others, particularly Gordon's *Bulletin 28* from 1924. A paper that Walls delivered in 1931, based largely on his thesis work, described the

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[78] Ibid., 72.

[79] Ibid., 75-76.

[80] Ibid., 78-79.

Asbury District (near the "Forks of the River") as having been relatively undeveloped when Gordon did his fieldwork.[81] His 1930 thesis had focused particularly on this area, which he described as a long narrow belt located at the emergence of a southern "limb" of the Holston marble formation.[82] In the thesis, Walls dealt with the definition of marble up front: "In geology the term (marble) is properly restricted to a calcareous rock which has lost its original fragmental character and become crystalline by metamorphism." Further, he stated that just because a limestone will "take a polish" does not mean it is a marble, for "there are marbles that will not… and there are limestones that will and yet are not marble."[83] For authority, he quoted Frank W. Hoyt, editor of *Stone* magazine:

> A structural marble is a crystalline limestone…or…a pure dolomite. Decorative marbles are those limestones that are useful for ornamental purposes…They are almost invariably crystalline in formation. Varieties of calcite that may be polished …are frequently called marbles, but if there is an absence of crystallization that use of the term is not approved by careful writers.[84]

Walls acknowledged the difficulty of distinguishing marble from limestone and identified the crystalline limestones as being the only ones capable of sustaining "a very high polish." While he recognized that limestones can and often do serve as

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[81] Forks of the River describes the area around the confluence of the French Broad and Holston Rivers just above Knoxville, which is now considered to have been one of the earliest areas of marble extraction in Knox County.

[82] James G. Walls, "The Holston Marble at Asbury, Tennessee," *Journal of the Tennessee Academy of Science* VIII (1933): 124.

[83] James G. Walls, "Holston Marble at Asbury, Tennessee" (master's thesis, University of Tennessee, 1930), 1.

[84] Ibid., 1-2. Frank W. Hoyt, *Stone* (December 1923): 695.

marbles for decorative purposes, he made it a point to state outright: "Marble is a metamorphosed limestone."[85]

Agreeing with his predecessors in the field of Tennessee geology, Walls was convinced that the limestone beds in which marbles occur had formerly been depositions on the bottom of a sea. He placed this occurrence "in the historical time geologists call Ordovician." He thought that during the "mountain building process a great amount of heat and enormous pressures were produced"…and that the stone in the Asbury section of Knox County had assumed a semi-fluid state after which the particles of calcite were rearranged and recrystallized. Walls believed that the stone from these particular quarries was exceptional in this regard: "It is the opinion of the writer that the heat and pressure caused by the movement of the formations was great enough to recrystallize this one bed because of its chemical composition while it was not great enough to metamorphose the others due to their chemical make-up which is slightly different."[86] He did not elaborate on what that difference was. Unlike Merrill, he did not suggest that the Asbury marble was no longer fossiliferous as a result of having been recrystallized. Perhaps Walls was giving a nod to Dale's observation of "twinned" crystals by coming to the conclusion that microscopic examinations had shown that the fossiliferous marbles were least likely to crack because "the fossils cross each other in a network of reinforcements … " [87]

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[85] Ibid., 2.

[86] Ibid., 5.

[87] Ibid., 7.

Beginning in the mid-1930s, the Tennessee Valley Authority, which had its own Division of Geology, prepared numerous reports on the resources within its jurisdiction, in some cases studying those in areas that it proposed to flood. While the newly arrived government authorities were no doubt welcome colleagues for the community of geologists in Tennessee, the TVA geologists' "fundamental orientation," according to environmental historian Alfred Cowdrey, "was and remained economic."[88] *Bulletin 1*, from 1934, a report by TVA geologist Edwin C. Eckel, was entitled "Engineering Geology and Mineral Resources of the Tennessee Valley Region." Sorting through the four ages of rock found in the TVA region, Eckel created a table showing that the stone found in the Appalachian chain belonged to the Pre-Cambrian era (metamorphic). While the primary stones of this class were granite and gneiss (a banded stone of similar composition), Eckel, perhaps referring to the earlier work of C. D. Walcott and Arthur Keith of the U.S. Geological Survey, made an exception for certain areas in the western flank of the mountain range, finding there "highly metamorphosed sedimentary rocks, which now appear as beds of slate, marble, conglomerate and quartzite."[89]

The introduction to TVA's *Bulletin 6* "Structural Materials of the Tennessee Valley Region" (1937) suggested that it had been written to meet to considerable

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[88]Cowdrey, 153.

[89] Edwin C. Eckel, *Engineering Resources and Mineral Resources of the Tennessee Valley Authority Region: General Engineering and Geology Division* [Bulletin 1] (Knoxville: Tennessee Valley Authority, 1934), 3-5.

public demand for information about the *limestone* of the area. The report, however, mentioned the importance of *marble* to the local economy, noting that in 1935 over half the marble produced in the United States came from the four-state region of Alabama, Georgia, North Carolina, and Tennessee.[90] This bulletin included a section titled "Holston Marble," in which the authors, Ernest L. Spain, Jr., Robert A. Laurence, and Nicholas A. Rose, called it "coarsely crystalline limestone" and "one of the purest calcareous formations in the area." They stated that it was not, however, a true metamorphic marble, adding "and it contains many fossils," perhaps suggesting that the presence of fossils proved that the stone was fully metamorphic, and not sound enough, that is, valuable enough to prevent the quarries from being flooded.[91]

In 1936, under the aegis of State Geologist Walter Pond, the Division of Geology, then located within the Department of Conservation, again revived the serial publication *Resources of Tennessee*. One of its first efforts, printed with the aid of the Works Progress Administration, was "A Summary of the Mineral Resources of Tennessee" by Kendall E. Born. Typical of many Depression-era projects, rather than reporting new research, the publication was a collection of resources. As such, it can be said to represent Tennessee's geologic knowledge at the time. In a

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[90] Ernest L. Spain, Jr., Robert A. Laurence, and Nicholas A. Rose, "Building and Crushed Stone of the T.V.A. Region" in *Structural Materials of the Tennessee Valley Authority Region: Division of Geology* [Bulletin 6] (Knoxville: Tennessee Valley Authority, 1937), 6.

[91] Ibid., 7.

description of the classes of rocks represented in Tennessee, the following appeared under "Metamorphic Rocks": " … the heat and pressure associated with structural disturbances in East Tennessee have changed some of the limestones (sedimentary rocks) into practically a new rock type, marble (metamorphic). Since East Tennessee is the only part of the state which has been subjected to intense crustal movements, the metamorphic rocks are restricted to this area."[92] Under the geologic time table in this publication, marbles are listed in the Cambrian era, while limestone appears in eras ranging from Cambrian to Ordovician to Silurian to Devonian to Mississippian.[93] However, an explication of the Ordovician in East Tennessee listed the Holston Marble within the Chickamauga Limestone, of the Lower Ordovician era, and described it as "mostly crystalline." A narrative summary, under the heading "marble," credited previous work for the Division by Safford (1869), Ashley (1910), and Gordon (1911, 1924). Finally, the report noted a sharp decline in marble production in Tennessee. Having reached a peak of nearly 5.8 million dollars in 1929, output was stagnant, at one tenth of that amount, in 1934.[94]

In a further effort to boost the economy during the lingering years of the Great Depression, the Division published their own counterparts to the TVA bulletins as a series of "markets circular" pamphlets. Pond's stated mission was

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[92] Kendall E. Born, "A Summary of the Mineral Resources of Tennessee," in *Resources of Tennessee* [2nd Series] (Nashville: State of Tennessee Department of Education, Division of Geology, 1936), 11.

[93] Ibid., 17

[94] Ibid., 72.

"promoting the development of the mineral resources of Tennessee;" he saw these slim brochures as answering inquiries of consumers as well as present and prospective mineral companies.[95] The information in them was presented in pragmatic fashion, one author noting that the Holston marble was one of the "purer limestone formations." In *Circular 3: Limestone*, marble was listed among the local products of Knox County.[96] *Markets Circular 11: Preliminary Directory of Mineral and Chemical Industries in Tennessee* had a separate listing for marble, in which was reported that the marbles produced in the Knoxville area were "world famous as an interior decorative material" and that the output of quarries and mills for 1939 was the largest in the United States. The pamphlet included directory listings for six companies in Knox County and two in Blount County: one in Louisville and one in Friendsville. As there was no mention of Hawkins County marble, one might assume that there were no longer quarries operating there or that their output was negligible in terms of the state economy.[97]

And yet, James Gray Walls, who had earned the master's degree from the University of Tennessee and served on the geology faculty there in the 1930s and 1940s, wrote a 1946 dissertation on the whimsically-named "Dolly Varden" marble

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[95] Walter Pond "Forward" (sic) in *Markets Circular 3: Limestone* (Nashville: Tennessee Department of Conservation, Division of Geology, 1937), 2.

[96] Ibid., 8-9.

[97] George I. Whitlatch, *Markets Circular 11: Preliminary Directory of Mineral and Chemical Industries in Tennessee* (Nashville: Tennessee Department of Conservation, Division of Geology, 1941), 26.

of Hawkins County.[98] As had Safford and Keith, he considered the marble beds of upper East Tennessee's Hawkins County to have once been contiguous with those in and around Knox County, and so included the variegated "Dolly Varden" in the Holston Marble designation.[99] Walls's overall conclusion was that while the same type of variegated, chocolate-or-rust-colored stone occurred throughout the length of Holston Marble stratum, it was found only in the "extremities," near the outer edges of the formation, whereas the pink and gray marbles were found in the "heart" of the stratum: the deeper and wider portions of the marble beds.[100] In his dissertation Walls, as in his master's thesis, defined marble as "a metamorphosed limestone…a crystalline rock composed of grains of calcite," this time adding "or more rarely dolomite." He now referred to the Holston Marble specifically as "a recrystallized limestone which was originally formed mainly by the accumulation of the calcareous remains of such organisms as bryozoans, brachiopods, and crinoids." He explained the transformation of calcareous sediments into "highly crystalline limestone" through a combination of compacted weight, the formation of secondary

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[98] Walls connected the use of the name Dolly Varden, which was used in the 1870s to describe a type of multi-colored blouse as well as a colorful spotted trout, to a brightly-dressed character in Charles Dickens's novel *Barnaby Rudge*.

[99] In an interesting aside, Walls added a page to his text that referred to a recent paper by Chilton Prouty, who was, perhaps, a relative of his thesis advisor, Dr. W.F. Prouty of the University of North Carolina. Prouty had written a recent article that suggested renaming the "Holston Marble" "Farragut Limestone" in order to call attention to the ongoing prominence of the industry at Farragut, Tennessee. James Gray Walls, "The Dolly Varden Phase of the Holston Marble," (PhD diss., University of North Carolina, 1946), addendum, 13a.

[100] Ibid., 28.

calcite through water percolation, and the tilting of rock mass during mountain building, concluding: "the recrystallization of the Holston marble seems … not to be the result of alteration by the normal means of metamorphism, but due to recrystallization and deposition of crystalline calcite in an amorphous shell mass resembling coquina."[101] Further, Walls theorized that because the Dolly Varden lacked the cross-bedding common in the pink and gray marbles and it also contained more iron oxide, it may have formed closer to the shores of the inland sea than in the cross-currents of the silted bottom.[102]

The 1948 master's thesis of Hai-Chuan Teng for the Geology Department of the University of Tennessee examined the commercial marble industry in and around Knoxville. Teng began with his own definition of marble: "Strictly speaking, the true marble is a limestone that has undergone recrystallization."[103] He referenced Wall's recent dissertation and spoke of the Holston marble in the global sense, stating that it belonged to the crystalline limestones and it was of middle Ordovician age. He also used the term "subcrystalline," apparently inventing a term to describe the "part-way" marble described by T. Nelson Dale, now claiming that the Holston formation contained both crystalline and subcrystalline marbles, in

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[101] Ibid., 14-15.

[102] Ibid., 43-44.

[103] Hai-Chuan Teng "Marble Deposits and the Marble Industry of the Knoxville Area" (master's thesis, University of Tennessee, 1948), 1.

which fossil fragments (crinoids and bryozoans) had been enclosed and filled with "secondary crystalline calcite."[104]

Like other geologists before him, Teng described the Holston Marble as a limestone that had originated as calcareous deposits on a seabed drifted along by currents, ignoring Wall's recent exception for the "Dolly Varden" as having formed near the shores. Teng's hypothesis was that the limestone had undergone "diagenetic" alteration (a term referring to changes caused by chemical or other surficial processes) and been metamorphosed during the Appalachian mountain-building period.[105] To explain the condition he had dubbed "subcrystalline," Teng followed Dale's lead in suggesting that water percolating through the calcareous layers had been responsible for depositing calcite, which had itself become recrystallized through some sort of chemical reaction.[106]

In 1953, the Tennessee Division of Geology, jointly with the U.S. Geological Survey, published a new geologic map of East Tennessee. Geologist John Rodgers of the USGS, in collaboration with geologists from the Tennessee Division of Geology and TVA, wrote the text. Rodgers proposed a significant change to the geology of East Tennessee marble. Instead of using the designation Holston Marble, Rodgers referred to the area as the Holston Formation, and added to it what had previously been called the Tellico sandstone. As had Keith, he situated the Holston Formation

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[104] Ibid., 2, 60.

[105] Ibid., 62.

[106] Ibid., 88; Dale, *The Commercial Marbles of Western Vermont*, 22.

(using the same geological symbol *Oh*) within the Chickamauga Limestone, to which he assigned the new symbol *Och*. By including the Tellico Sandstone in the Holston Formation, Rodgers proposed that much of the "'Tennessee marble' of commerce," which he described as a "coarsely crystalline limestone" was a combination of limestone and sandstone (calcarenite). Part of his reasoning may have come from his conclusion that the striped effect found in these marbles, which he called cross bedding, was created by sand deposits made of calcite grains composed of very fine fragments of crinoids and bryozoans.[107]

Joe Parks Walters, in a 1958 master's thesis for the department of Geology and Geography at the University of Tennessee, concentrated on the geography of the Knoxville marble industry area and the economic impact of the industry. While he summarized the history of the industry from older sources like Gordon, he apparently wrote his own section on the geology of the marble. He described it as averaging 99.5 per cent calcium carbonate ($CaCO_3$) but varying somewhat in chemical content depending upon the remaining minerals found in different locations.[108] And his definition of marble was based on the process by which it had been formed:

> Marble is the result of limestone having been metamorphosed under heat and pressure, aided by percolating waters, to the point of crystallization. If

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[107] John Rodgers, *Geologic Map of East Tennessee with Explanatory Text* [Bulletin 58, II] (Nashville: State of Tennessee Department of Environment and Conservation, Division of Geology, 1953, reprinted 1993), 69-70.

[108] Joe Parks Walters, "The Marble Industry of the Knoxville Area" (master's thesis, University of Tennessee: 1958), 14.

> limestone is heated under pressure great enough to prevent the escape of carbon dioxide, it will assume a semi-plastic condition, thereby permitting a gradual replacement of the molecules of calcium carbonate. It should be pointed out that most Tennessee marble has not been completely crystallized. Fossil remains are often found in it, the occurrence of which is impossible where complete crystallization has taken place. However, it is very definitely 'marble' in a commercial sense because it is capable of taking a beautiful finish or polish and has the approval of the buying public.[109]

His words recall the early twentieth-century boosterism of Gordon and both of their nineteenth-century counterparts in Tennessee geology. While Walters clearly grasped all of the pertinent issues, he also continued to allow that at least some of Tennessee's marble might actually be metamorphic stone: "The mountain building process through the action of folding, faulting, and uplift consolidated the soft materials and caused the necessary heat and pressure for the formation of marble." On this point, Walters referred to Walls's 1933 article in the *Journal of the Tennessee Academy of Science* for authority, theorizing that the slightly different chemical composition of marbles in different locations accounted for the differences in metamorphic quality.[110]

The Tennessee Division of Geology produced an update on the marble industry in 1960. Authors Stuart W. Maher, Principal Geologist for the Division's Knoxville office, and Walters, now an industrial economist with Tennessee's Industrial and Agricultural Development Commission, also in Knoxville, visited many of the quarries listed in Gordon's 1924 study of the industry. This document,

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[109] Ibid., 15.

[110] Ibid., 16-17.

which referenced older research, seemed to be concerned primarily with the economic status of the industry, reflecting the industry-friendly temper of the post-World War II South. It referred to marble throughout, only mentioning limestone in the context of waste marble: "In 1957 producers sold 17,905 tons of crushed or broken marble. Some scrap marble is sold for agricultural lime…One quicklime company operates on waste purchased from a marble mill, supplemented by marble quarried by the lime company itself." [111]

In 1960, Maher and Walters found seven companies operating fourteen quarries in and around the Knoxville area, but made no mention of lime companies operating former marble quarries. They recapped the history of the industry, based mostly on Gordon's 1924 retelling of Safford's 1869 report, adding little new historical information. More valuable was their insertion of location data for quarries based upon USGS-TVA 7.5 minute quadrangle maps.[112] However, they continued to rely on Gordon's and Safford's dated and somewhat inaccurate history of the industry, and their assessment of the "physiochemical" strength of the marble, which revealed the marble to have high crushing and tensile strength and low rates of absorption, came from T. Nelson Dale's 1924 study.[113]

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[111] Stuart W. Maher and Joe P. Walters, *The Marble Industry of Tennessee: Tennessee Division of Geology* [Information Circular 9] (Nashville: State of Tennessee Department of Conservation and Commerce, 1960), 21.

[112] Ibid., 1-5.

[113] Ibid., 21. Even a relatively recent article by Robin C. Hale entitled "The Effects of Weathering on the Holston Marble" cited tests reported or conducted by Gordon, Dale, and Bowles (Bulletin 28, 1924) and G.P. Merrill (1897) as authority for

Even though the interest of geologists may have flagged in the intervening years, the industry itself continued to reach new highs. Maher and Walters reported statistics for 1957 that showed Tennessee leading the nation in marble production.[114] "Marble Resource Map: Known Areas of Economic Importance," which was produced by Maher to be included in the Tennessee Division of Geology's *Information Circular 9* featured marble areas as dark lines in a manner similar to Keith's 1895 Knoxville folio map. It was likely intended as a lure for new industry.

In 1973, the Tennessee Division of Geology published a comprehensive report on the geology of Knox County, Tennessee to coincide with a national meeting of geologists held in Knoxville that year. In the report's first section, geologist Robert C. Milici set out the latest geologic mapping of Knox County strata. He noted that methodology had changed markedly in the past few decades—moving from an emphasis on identifying and correlating geologic formations to understanding the origins of the rocks themselves with a renewed interest in the study of fossils, which he called paleontological stratigraphy.[115] Stuart W. Maher prepared a field trip on Knox County mineral resources for the meeting, which was

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the conclusion that "Holston marble is very well suited for exterior use." *Newsletter Tennessee Division of Geology* 11, no. 1 (June 1998), 10-11.

[114] Robert E. Fulweiler, *Dimension Marble*: *Tennessee Division of Geology* [Bulletin 83] (Nashville: Tennessee Department of Environment and Conservation, 1992), 26.

[115] Robert C. Milici, "The Stratigraphy of Knox County, Tennessee" in *Geology of Knox County, Tennessee: Tennessee Division of Geology* [Bulletin 70] (Nashville, 1973), 9.

designed to "show the relationship of mineral industries to an urban area."[116] "Stop 3" on the field trip was Forks of the River Quarry, American Limestone Division, introducing visiting geologists to the earliest known area of marble quarrying in Knox County, by then home to a large crushed stone operation and a source of supply for a nearby lime kiln. Although Maher identified the material being quarried by the American Limestone Company as belonging to the Mosheim formation of the Lenoir Limestone (according to Milici's chart, both of these belonged to the Middle Ordivician age, Chickamauga Group, like the Holston Limestone), he referred back to Gordon (1924) for a discussion of the geologic origins of the marble.[117] One of the other field trips, a close look at the Holston formation led by Kenneth R. Walker and Kenneth F. Ferrigno, indicated that there was still some question as to the unusually complex origins of the Holston Formation, and that its age was still being debated by geologists.[118]

Twenty years later, an update on marble as a dimensional building stone in *Tennessee Division of Geology Bulletin 83* (1992), seemed to reflect a new scientific consensus regarding the geology of Tennessee marble:

> Geologists define marble as a metamorphic rock consisting predominately of fine-to coarse-grained, recrystallized calcite and/or

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[116]Stuart W. Maher, "Field Trip No. 3: Mineral Resources of Knox County, Tennessee" in *Geology of Knox County*, 169.

[117] Ibid., 172.

[118] Kenneth R. Walker and Kenneth F. Ferrigno, Field Trip 1, Stop 4 "Holston Formation: An Insight Into the Three Dimensional Relationships Between Reef-Core and Reef-Flank Facies" in *Geology of Knox County Tennessee,* 136.

> dolomite…The "marbles" quarried in East Tennessee for over 150 years are not metamorphic rocks but rather coarse-grained, fossil-fragmental limestone (calcarenite) from the Holston Formation and Maryville Limestone, of Ordovician- and Cambrian-age, respectively.

In the same paragraph, however, the author noted that the American Geological Institute had declared in 1983: "commercially…any crystallized carbonate rock that will take a polish is called marble."[119] Following long-time precedent in Tennessee, this statement was probably included to pay homage to continuing commerce in Tennessee marble. Statistics from the U.S. Bureau of Mines for 1991 reported a doubling of Tennessee's production in a two-year period, due primarily to several large contracts acquired by Luck Stone, which had moved into Blount County in 1989. However, the author attributed an overall industry slow-down to high costs of local quarrying and transportation and the availability of less-expensive Italian and Spanish marble.[120]

The latest official word on the question of limestone versus marble is the explanatory text accompanying the Tennessee Division of Geology's 2004 map of the Camelot quadrangle, which includes part of Hawkins County. The authors state that the historic marble quarries were found in the "Holston Limestone." Their fieldwork relied upon Gordon's 1924 survey and his small-scale, hand-drawn map of the

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[119] Robert E. Fulweiler,"Dimension Marble" in *Tennessee Division of Geology* [Bulletin 83] (Nashville: Tennessee Department of Environment and Conservation, 1992), 26.

[120] Ibid., 27.

Galbraith Springs area to identify quarries.[121] The study is important because it covers the earliest marble area in the state—now completely closed down and nearly lost to history. Perhaps it is only because this area is no longer considered viable for marble mining that its chroniclers have been able to come up with the simplest and least deceptive definition for Tennessee marble yet. They described it as "fossil-fragmental and calcarenitic limestones that take a high polish and meet all requirements of stone used as marble."[122]

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[121] Gordon, 1924, p. 51. For his 1911 report, Gordon produced a hand-drawn map that included all of the marble areas of East Tennessee. In 1924, he opted for professional geologic maps of Knox County and Blount County. For the other marble areas, which he obviously considered of lesser or possibly diminishing importance: Luttrell, Concord, and the Galbraith Springs area of Hawkins County, he drew small scale, half-page maps.

[122] Peter J. Lemiszki et al. *Map of Camelot Quadrangle: Tennessee Division of Geology* (Nashville: Tennessee Department of Environment and Conservation, 2004).

CHAPTER III

MATERIAL POLITICS

In the early days of the new nation many of the country's leaders were caught up in the latest "scientific" inquiry—influenced by Enlightenment ideals grounded in human reason. But they also honored the past, pioneering a new style of governing based on a combination of innovative lawmaking and borrowings from both contemporary and ancient European governments. So, too, did they customize past architectural models into American icons. George Washington was drawn to European examples as he considered the design of buildings worthy of the American republic. He helped select James Hoban's modified Palladian villa design, which was based on house models in Dublin and Essex, for the President's House.[1] And he cast the final vote for William Thornton's Roman Pantheon flanked by wings, colonnades, and a rotunda, in the design competition for the Capitol building. Thornton, like Thomas Jefferson, was a "gentleman architect" who kept up with the latest scientific advances, was aware of fashionable French taste, had tried his hand at practical inventions, and subscribed to the latest in published architectural sources.[2] He became close to the President and his family. A few years later,

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[1] John C. Van Horne and Lee W. Formwalt, eds. *The Correspondence and Miscellaneous Papers of Benjamin Latrobe Volume I: 1784-1804* (New Haven: Yale University Press/The Maryland Historical Society. 1984), 260-261.

[2] William Thornton, a European-educated medical doctor living in the West Indies, had won the prestigious architectural competition for the Philadelphia Library

Thornton was drawing plans for Woodlawn, a large brick plantation house built on part of Washington's Mount Vernon estate ca. 1800-05 for his nephew, Major Lawrence Lewis, and his wife, Eleanor "Nelly" Custis.[3]

Curiosity, respect for tradition, and pragmatic adaptation were hallmarks of a period when most "professionals" were likely to be trained amateurs who had "read law" in the office of a practicing judge, or gone abroad to "take a medical degree" with a doctor affiliated with a prominent university hospital, or, like Thornton and Thomas Jefferson, traveled abroad to study notable architecture. Thornton papers editor C. M. Harris confirms that President Washington, Secretary of State Jefferson, and the three appointed commissioners in charge of organizing the nation's new capital city were "largely in agreement on the representational value of public architecture and nuances of republican (and Whiggish) meaning of Roman neoclassicism."[4] Those charged with building such highly visible projects as the Capitol and the President's House did their best to emulate not only the designs, but

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Company in 1789. The commissioners of the Capitol, not having found any of the ten submitted designs in the 1792 competition entirely satisfactory, allowed Thornton to submit several months after the competition deadline. Thornton's lack of technical knowledge and experience with building techniques caused problems for the succession of architect-builders who were to oversee the erection of the Capitol. Marcus Whiffen, *American Architecture 1607-1860* (Boston: MIT Press, 1981), 126-127.

[3] Woodlawn Plantation, Alexandria, Virginia, National Trust for Historic Preservation. http://woodlawn1805.org/ [accessed 17 December 2010].

[4] C. M. Harris, "Washington's Gamble, L'Enfant's Dream: Politics, Design, and the Founding of the National Capital," *William and Mary Quarterly* (Third Series), 56, no. 3 (1999): 529.

also the materials and workmanship they had seen in Europe.[5] In the minds of Jefferson and Pierre L'Enfant, the French architect working with President Washington to lay out the new capital city, the choice of Roman and Greek architectural elements in neo-classical architecture followed French precedent. Yet the new buildings were also inspired by British neoclassicism, as translated through Palladian-influenced architects like Robert Adam and Sir John Soane. When British-trained Benjamin Latrobe, whose work on public projects in England had honed his natural talent in structural engineering, was appointed "Surveyor of Public Buildings" by President Jefferson in 1803, he carefully threaded his way through the complicated pastiche of architectural elements that made up Thornton's original design, taking pains to appear as if he were adhering to it in principle, while critiquing its flaws and working in collaboration with Jefferson to make the building more functional. Some of Latrobe's innovations included the creation of grand neoclassical interiors featuring interior domed ceilings, which Jefferson particularly favored; balanced proportions for the wings of both the Capitol and the President's House; and correcting some of the as-built engineering flaws that had caused

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[5] Hoban, who was born in Kilkenny about 1758, had apprenticed as an architect in Dublin, and had emigrated soon after the American Revolution. HeA known architect/builder in Charleston, South Carolina, he moved to Washington in late 1792 at the invitation of President Washington, who put him in charge of designing and building the president's house. One of the founders of Federal Lodge Number One of Freemasons in Washington in 1793, Hoban also helped oversee construction of the Capitol building prior to the appointment of Latrobe. William B. Bushong, "Imagining James Hoban: Portraits of a Master Builder," *White House History*, no. 22 (White House Historical Association, 2005), 49.

foundation problems at the Capitol and roofs to leak on both buildings.[6] In one other important aspect, Latrobe also set the stage for future federal projects. He recommended that professional stonemason George Blagden be contracted to provide cut stone ready to set, rather than having the government involved in supervising the process from quarry to finished facade.[7]

In a 1976 essay entitled "America as Symbol," Smithsonian American Art Museum director Joshua C. Taylor described both Washington and L'Enfant as steeped in Enlightenment values. Both felt the buildings and the new city itself should adhere to the latest in "rational taste" and "provide(d) a spacious, measured environment that would be conducive to clear thinking and dignified conduct."[8] While this may have been a moment of opportunity for "Renaissance" men like William Thornton and Thomas Jefferson to influence the style of architecture for the new nation, Harris argues that practical concerns were perhaps even more important. Washington and L'Enfant were engaged in a serious public relations campaign trying to maintain enough momentum to build the new capital city. The city, at ten miles square, would have the largest landmass of any American city. It was supposed to be "self-funding" through the sale of lots to new residents, so it also needed to be attractive in both physical and economic terms. Its location at the

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[6] Van Horne, 258-259.

[7] Ibid., 279.

[8] Joshua C. Taylor, *America as Art* (Washington, D.C.: Smithsonian Institution Press, 1976), 14.

mouth of the Potomac River, which joined the Shenandoah at Harper's Ferry, draining the eastern ranges of the Allegheny Mountains, was expected to aid in transportation of materials and to make the new city a center of commerce. And it was hoped that the young American metropolis would draw wealth away from the frontier (where it might potentially flow into the hands of the Spanish, British, or French) and back into federal coffers. But these and other optimistic predictions, such as that skilled artisans and suppliers would immediately flock to the new city, had not yet materialized.[9]

Native Materials: National Icons

Despite the fact that Jefferson's announcement for the 1792 competition for the Capitol had specified "roman brick," Washington overruled him in favor of plain light-colored dressed local stone for the exterior.[10] This was the first of many times that native stone would be chosen for federal building projects. Washington's decision seems to have been taken without explanation, probably as much for reasons of appearance as for pure practicality. The fact that a massive amount of fine-grained sandstone suitable for building was readily available was an appealing

[9] Ibid., 534-536.

[10] Harris,"Washington's Gamble, L'Enfant's Dream," 551.

alternative to making bricks.[11] The President, in a hurry to begin construction on the President's House and Capitol, also approved government funding to import English stonecutter George Blagden and recruit a lodge of Scottish stonemasons from Edinburgh. This latter group included master mason Robert Brown, who would become foreman of stonework on several early federal building projects.[12]

The decision to use light colored stone (Aquia sandstone from Virginia) for both the exterior and interior walls of the Capitol pleased architect Thornton. "The freestone with which we are erecting the Capitol and President's House is of a quality deemed superior to the Portland stone," observed Thornton in 1797, " We get it about 40 miles down the River Potomak."[13] Geological historian Kenneth Hudson affirms that Portland stone, a light colored limestone, was the building material of choice for English public buildings during the eighteenth century.[14] Thornton's plans for the interior of the building had called for white marble columns and pilasters in the rotunda. He envisioned them combined with the "fine

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[11] This stone was referred to as freestone, which meant that, for purposes of appearance, it had no discernable grain that dictated the direction in which it could be laid. Architects and builders would later understand that setting stone without regard to its natural "bed" often resulted in deterioration.

[12] William C. Allen, *History of the United States Capitol: A Chronicle of Design, Construction and Politics* (Washington, D.C.: United States Government Printing Office, 2001), 25.

[13]C. M. Harris, ed. *Papers of William Thornton* (Charlottesville: University Press of Virginia, 1995), 426.

[14]Kenneth Hudson, *The Fashionable Stone* (Bath: Adams & Dart, 1971): 38.

freestone you have in use" but believed that the interior marble would have to be imported from Italy, as "none (of the marble found in this country) has yet been procured in sufficient quantity or quality to answer the end, the price here would forbid its use."[15]

Despite Thornton's doubts, the sandstone used on the interior of the building did stand up to sculptural carving, as seen in Benjamin Henry Latrobe's simple Corinthian capitals of acanthus leaves and stems, based on Greek models, which are found on a small circle of columns in the old House vestibule. According to William Allen, Historian of the Capitol, these columns, which were created ca. 1807, are the earliest-known use of the Greek order in the United States.[16] Latrobe, however, was not content merely to emulate the ancients. He, like Thomas Jefferson and contemporary artist and amateur archaeologist, Charles Willson Peale, had a wide interest in natural history. Latrobe and Jefferson believed that America's natural resources could be seen as symbols of the country itself. In 1809, in consultation with Jefferson, Latrobe invented an "American" version of the classical Corinthian capital.[17] The next column capitals he ordered to be carved in sandstone and marble for the interior of the building incorporated images of corn stalks and ears, cotton,

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[15]Harris, *Papers of William Thornton,* 244.

[16] Allen, *History of the United States Capitol*, 73.

[17]Latrobe to Jefferson 28 August 1809, *The Correspondence and Miscellaneous Papers of Benjamin Henry Latrobe Volume II: 1805-1810,* John C. Van Horne, ed. (New Haven: Yale University Press/Maryland Historical Society,1986), 749-750, 752.

and magnolia leaves and flowers—symbolizing, in essence, the American reinvention of Athenian democracy. During the Capitol's rebuilding in 1816, when Latrobe had the opportunity to design a third set of column capitals, he chose tobacco leaves and flowers, creating yet a third variation on the Corinthian order with native components.[18]

The founders and early planners were also concerned that the buildings they commissioned be separated in the public imagination from intimations of royalty. So, while Washington and Jefferson envisioned noble buildings on a monumental scale, their overall desire for the new capital city to represent republican simplicity tempered their design decisions. While they may have considered importing building materials, such as Italian marble, or employing decorative interior finishes that would mimic marble's appearance, such as crushed stone *scagliola*, a desire to maintain the appearance of frugality and a judicious use of public money recommended against it. Employing materials close at hand like the Aquia sandstone, which was originally painted white to give it the appearance of marble, seemed to serve both purposes well.

The use of marble itself would have further carried out the association to classical architecture, both at its point of origin on the Peloponnesian and Italian peninsulas, or as imported by European architects for buildings of civic importance. White marble, in particular, appears to glisten because of light reflecting from the

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[18] William Howard Adams, ed., *The Eye of Thomas Jefferson* (Washington, D.C.: National Gallery of Art, 1976): 88-90, 113.

crystals within its physical structure. The word marble comes from the Greek *marmor*, meaning shining stone. During the second half of the nineteenth century, when marble did become the building stone of choice for many American public buildings, more than one American geologist made a point of describing the essential characteristic of marble as its crystalline structure.[19]

Although the President's house, the Capitol, and the earliest government buildings of the new capital city would not be constructed of marble, their stone construction, monumental scale, prominent site placement, classical design, and white-painted facades served not only to set them apart, but also to remind citizens of Greek and Roman cityscapes. Architectural historian Ingrid Steffensen-Bruce, in *Marble Palaces, Temples of Art* (1998), has argued that the patron/builders of several of the most prominent American art museums built from 1890 to 1930 adopted the neo-classical style because it conveyed power and authority.[20] These monuments to culture and wealth, which echoed their earlier federal counterparts in Washington, were not only constructed of marble, but their interiors were also furnished with decorative marble. Such great public buildings, and others, like the grand railway stations that marked important nodes of the massive network of transportation extending from coast to coast, were the vanguard of a turn-of-the-

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[19] See Chapter II of this dissertation for a chronology of geological descriptions that use some form of the term crystal.

[20] Ingrid A. Steffensen-Bruce *Marble Palaces, Temples of Art: Art Museums, Architecture and American Culture: 1890-1930* (Cranbury, NJ: Bucknell University Press, 1998), 14.

century construction boom during which the American marble industry would reach its greatest peak of prosperity.

Approximately one hundred years earlier, once the founders had chosen to replicate the noble structures of Greek and Roman antiquity in their own public buildings—so long as the buildings could be made to look like marble and function like marble—most any building materials could serve the purpose. In the early examples, initial plans calling for stucco-covered or whitewashed brick had given way to the quest for native stone. Washington, for one, must have recognized that available American stone not only exemplified republican simplicity but also allowed for a straightforward building process that could potentially prove more economical in materials and labor.

When Latrobe was re-hired to oversee the rebuilding of the Capitol after its 1814 immolation at the hands of the British, he made a public show of exploring nearby quarries in search of appropriate stone. While much of the Aquia sandstone from which the building was originally constructed had survived the fire, there was much to be replaced. In his *History of the United States Capitol*, William Allen describes Latrobe's 1815 forays into the wider Potomac River basin in search of suitable building stone. Some of the Aquia stone initially rejected as unsound was still available. But even more was needed, so Latrobe and his stone foreman, Blagden, went on the hunt for new sources. According to Allen, what Latrobe called the "Potomac marble" of Maryland's Catoctin Mountains was actually *breccia*, a sedimentary stone "composed of geologically fused pebbles of different colors." In

Loudon County, Virginia, also in the Potomac watershed, Latrobe found a white marble that he claimed was a rival to Italian Carrara.[21]

While neither of these were in fact "true" marble, Latrobe and Blagden judged them adequate for the construction at hand. Thus, almost all of the stone used in the rebuilding of the Capitol—other than one set of white marble capitals being carved on site by low-wage Italian workers in Carrara, Italy, under the supervision of Capitol artisan Giovanni Andrei—came from within hauling distance on the Potomac.[22] Andrei was the master carver responsible for much of the decorative stonework in the original building, and the same man who had been approached by John Sevier to evaluate a sample of Tennessee marble in 1814. Four decades later the availability of railroads in the South and West would mean that marble from as far away at Tennessee could be ordered in quantity for the interiors of the Capitol's new wings.

Codification and Accountability in Federal Building Construction

By the late 1830s, however, with a growing federal building program underway in Washington, D.C. the permanence of government buildings became an issue. Elected leaders were increasingly concerned not only that the public

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[21] Allen, *History of the United States Capitol*, 106.

[22] Ibid., 105.

buildings be appropriately impressive but also long lasting and fireproof. Officials had begun to believe that the use of sandstone for the President's House, the Capitol, and other early buildings was a mistake. Sandstone absorbed water, was prone to deterioration, and also required frequent repainting. Furthermore, prior to the advent of structural ironwork, solid stone vaulting was soon deemed preferable to brick and wood joist construction. The brick Treasury had burned in 1833 and brick walls still standing after the recent fire at the General Post Office had been deemed a hazard to passers-by on Washington streets.[23]

President Andrew Jackson may have been particularly sensitive to the issue; not only had government buildings in Washington recently burned, but his Tennessee home, the Hermitage, suffered a fire in March 1836. When he appointed architect Robert Mills to oversee construction of the new Patent Office and Treasury buildings later that same year, he cited Congressional legislation that required the buildings to be fireproof.[24] Mills had written to the President to underscore his

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[23] Washington Mayor Peter Force wrote to Commissioner of Public Buildings William Noland on 15 December 1836: "I would therefore suggest to you the propriety of either having them secured or taken down as soon as possible." National Archives and Records Administration, RG 42: Public Buildings and Grounds.

[24] Robert Mills, a South Carolinian who referred to himself as the first American-born professional architect, likely worked with Hoban in Charleston. He had apprenticed under Latrobe in Washington, and sought Thomas Jefferson as a mentor. The esteem in which he was held in his home state derived from supervision of several large public buildings based on his own designs. Mills, as Commissioner of Public Buildings in South Carolina in 1820, furnished plans ca. 1822 for what was very likely a fireproof building to replace the South Carolina State House, a large wooden structure that had begun to deteriorate almost as soon as it had been constructed ca. 1787-1790. Nearly three decades would pass before the start of construction on a permanent granite structure

appropriateness for the post: "I have … designed and executed some of the most important and difficult buildings in this country, with reference, particularly, to such as were of a fire-proof character… I would mention the following: the Philadelphia Bank … the Washington Monument, in Baltimore … the western wing of the penitentiary in that city … the Lunatic Asylum, Columbia, S. Ca … the powder-magazine … a number of court-houses and jails in that state; as well as the penitentiary at Baton Rouge, Louisiana."[25] Although Mills would have the satisfaction of building his own design for the new Treasury, he was charged at the same time with overseeing construction of the new Patent Office designed by architect William Elliott.

A month after beginning work, Mills again wrote to Jackson, this time to say that the cost estimate for the Patent Office, which amount had been written into legislation proposing its erection as was Congressional custom, had been based on a design for "a brick building, with floors of wooden joists," which made it, he stressed, "consequently not fireproof." Mills pointed out that the budgetary consequence of a recent House amendment that called for all future government buildings to be fireproof had gone unrecognized. He wrote: "The Act of Congress required of you to have the building erected of the same material of which the

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with interior masonry vaulting. John M. Bryan, *Creating the South Carolina State House* (Columbia: University of South Carolina Press, 1999), 2, 11-14.

[25]Robert Mills to Andrew Jackson, 4 July 1836, National Archives and Records Administration, RG 56: Treasury Department.

Capitol and the President's house are constructed, and also to make it fireproof … (I)t is materially impossible that it should be done … unless indeed, the dimensions are considerably reduced; and in that case the accommodations will be inadequate to the requirements of the office." He urged the President to request additional appropriations, reminding him of the wording of the original legislation: "that the same Kind of Material, of which the walls of the Capitol and the Mansion of the president are constructed, shall be adopted … provided a cheaper and more suitable materials (sic) cannot be procured," which he felt could be used to argue both for the substitution of granite instead of sandstone and also argue for approximately $50,000 in additional building funds to allow for fireproof (stone) construction.[26]

Apparently no definitive action was taken. In an end-of-the-year report to the Commissioner of Public Buildings, Mills mentioned that he was having to make changes and delay "expensive details of the plan" until such time as an additional appropriation was made or the decision was made to construct using brick as originally budgeted. He again cited "the requisition of Congress that it (the Patent Office) should be constructed of cut stone" and the "appropriation being found inadequate to meet this expense." Feeling confident that he was complying with the wishes of Congress for a fireproof building, and that additional appropriations would ultimately be secured, Mills had ordered split granite (an early form of thick

[26] Robert Mills to Andrew Jackson, 3 August 1836, Library of Congress, Manuscript Division, Andrew Jackson Papers.

veneer in which blocks were split and attached to exterior walls to give the appearance of solid stone construction, cutting in half the strain on the building's foundation and the cost of materials and transportation) for the building facades of both the Patent Office and the new Treasury, since it could apparently be obtained at the same cost as freestone.[27]

At the same time as he had appointed Mills to oversee construction of the Patent Office and new Treasury, Jackson had named William Noland to the post of Commissioner of Public Buildings.[28] A measure of the primacy of stone construction at this time can be ascertained from the fact that Robert Brown (one of the stonemasons originally recruited from Edinburgh along with George Bladen to work on the President's House) was named Superintendent (of Construction) at an annual salary only slightly less than Mills's.[29] According to Noland's year-end report for 1836, work on the Patent Office was progressing well. Proposals for building materials had been solicited via advertisement, some contracts for materials had

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[27] Robert Mills to William Noland, Commissioner of Public Buildings, 1 December 1836, House of Representatives, 24th Congress, 2d session, Doc. 10, Rep. No. 305:2-3.

[28] William Noland, 21 October 1836, copy from the original signed by Andrew Jackson 6 July 1836, National Archives and Records Administration, RG 217, General Accounting Office.

[29] George Wolf, 11 November 1836, copy from original signed by Andrew Jackson 9 July 1836, National Archives and Records Administration, RG 217, General Accounting Office. Mills was to be paid $1800 per annum; Brown $1600.

been issued, workshops had been fitted out, and workmen, some of whom were commuting to Washington, had been employed for several months.[30]

Soon after the inauguration of President Martin Van Buren on 4 March 1837, Noland, Mills, and Brown met with him about the stone to be used for the Patent Office. In a setback for all concerned, Van Buren chose the Aquia sandstone for the building. Perhaps the new president was merely unaware of the issues surrounding the use of sandstone, or perhaps he felt it politic to adhere to both spirit and letter of the original Senate legislation authorizing the construction of the Patent Office.[31] According to Mills's December 1836 report, split granite had already been obtained for the basement story, but since additional monies were needed, materials for the building's superstructure had not yet been purchased. Mills and Brown probably still hoped to use granite for the entirety of the Treasury building. But the work on that building would soon also come under scrutiny.

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[30] William Noland to Andrew Jackson, 3 December 1836, National Archives and Records Administration, RG 46, Senate, 24A-E2. For the months of August, September, and October 1836, laborers at the Treasury building were reimbursed for travel from Portsmouth and Petersburg, VA; Baltimore; New York; and Philadelphia. National Archives and Records Administration, RG 217, General Accounting Office, payroll dated December 2 1836.

[31] Pamela Scott, *Guide to the Papers of Robert Mills* (Wilmington, DC: Gale/Scholarly Resources Inc., 1990) [microfilm accessed at Smithsonian American Art Museum library]

Marble vs. Granite in the Federal Building Projects

As the federal building program grew in size and elected representatives overseeing the public buildings sought to understand modern building construction, they seem to have been losing confidence in Mills. In January 1838, Massachusetts Representative Levi Lincoln, Chairman of the Committee on Public Buildings and Grounds for the 25th Congress, wrote to Philadelphia architect Thomas Ustick Walter that members of Congress were questioning both the site for the new Treasury building and the plan for its construction.[32] Walter, the widely admired architect of impressive marble buildings at Girard College in Philadelphia, accepted an invitation to come to Washington.[33] According to architectural historian Susan Wojcik, Walter's subsequent report, published in Philadelphia, apparently expressed some concern about the proposed manner of attaching the split granite and recommended the use of iron banding to secure structural arches, as well as the use of utilitarian iron ornaments to hold the ashlar to brickwork.[34]

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[32] Levi Lincoln to Thomas U. Walter, 11 January 1838, National Archives and Records Administration, RG 42, Public Buildings and Grounds.

[33] Thomas Walter to Charles Naylor, 15 January 1838, National Archives and Records Administration, RG 233, Treasury Building.

[34] Susan Brizzolara Wojcik, "Thomas U. Walter and Iron in the United States Capitol: an Alliance of Architecture, Engineering, and Industry" (Ph.D. diss., University of Delaware, 1998), 71-72.

New England architect Alexander Parris, who had designed a number of notable granite buildings in Philadelphia and Boston, along with lighthouses for the federal government, was also invited to examine the Treasury, specifically with an eye towards siting and proportions, the amount of light afforded to the basement level, and the character and construction of the stonework. He was asked to determine whether the basement story would be sufficiently dry to preserve papers and if certain blocks of stone would remain securely in place through seasonal changes of temperature and moisture. In addition, Chairman Lincoln requested that he perform a similar examination of the Patent Office.[35] While neither Walter nor Parris was asked to comment on the choice of stone, the issue of whether marble was preferable to granite also arose at this time.

In early March 1838, Commissioner William Noland dispatched Robert Brown to survey marble quarries in the nearby region. Brown ventured to locations near Point of Rocks, Virginia, and Harper's Ferry, Maryland, where stone could easily have been hauled to the Potomac River, and brought back specimens. These included coarse mountain stone "unfit for the Public Buildings;" white marble from a vein that would only yield small quantities; and several other apparently satisfactory marbles (no color specified). He mentioned finding "nice" stone (gneiss?), slate, and limestone, adding: "I did not see the least appearance of granite

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[35] Levi Lincoln to Alexander Parris, undated, National Archives and Records Administration, RG 233, Treasury Building; Congressional Series, Report 737 16 March 1838 "New Treasury and Post Office Buildings," Reprints of Committee, 25th Congress, 2nd session, 1838: 34-35.

in any place." Brown also estimated the annual cost of leasing quarries, quarrying costs per perch (ledges of stone that break naturally into parallel sections) and hauling to the canal.[36]

The following year a congressional report weighed in on the question of using granite or marble for public buildings. Presented to the 25th Congress by Chairman Lincoln of Massachusetts, and Representative Zadock Pratt of New York, it included letters from experts in the stone trade who favored marble. Also included were details of cost and workmanship in freestone, granite, and marble, which had been submitted by Mills and Brown. According to testimonials from knowledgeable persons in Massachusetts, Philadelphia, and Baltimore, marble was available closer at hand than most granite, was easier to carve into decorative elements and friezes, and could be obtained and worked at a cost less than or equal to that of granite.[37] Again, Robert Mills seems to have been caught on the wrong foot. In 1836, after having solicited the backing of both the Secretary of the Treasury and the Commissioner of the Patent Office, he had recommended granite to President

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[36] Robert Brown to William Noland, 23 March 1838, National Archives and Records Administration, RG 42, Public Buildings and Grounds. The C&O (Chesapeake & Ohio) canal, completed from Georgetown to Harper's Ferry by 1833, opened the possibility of sending heavy loads of stone downriver by barge.

[37] 25 February 1839, House of Representatives, 25th Congress, 3rd session, Document No. 221 and Report No. 305, included testimonials from Charles Henry Hill, West Stockbridge, Massachusetts; John Struthers and Adam Traquair, Philadelphia; Robert Gilmore, Jr., Baltimore; William Struthers, Philadelphia.

Jackson as the best substitute for the increasingly unsatisfactory sandstone for the Patent Office and Treasury buildings.[38]

No doubt politics played a hand in the proceedings that would ultimately undermine Mills's authority once and for all. Levi Lincoln, elected as an Anti-Jacksonian to the 23rd and 24th Congresses, had come to the 25th Congress as a Whig. Pratt was a Democrat, serving under home-state President Van Buren, Jackson's endorsed successor. Both represented constituents engaged in the marble industry, some of whom had even been consulted in the compilation of the committee's report. As a result of the report, the House Committee on Public Buildings recommended marble as the material of choice, so long as it was competitive in price, for government buildings.[39] Approximately one month prior to the report to Congress, Robert Mills had submitted drawings for a three-story granite building to replace the old Post Office on E Street. As a consequence of the Committee's work, those plans were changed. The contract to furnish marble for the General Post Office was awarded to Alexander Masterton and Robert Smith of Westchester County, New

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[38] Robert Mills to Andrew Jackson, 3 August 1836, National Archives and Records Administration, RG 56, Treasury Department. In 1836, Levi Woodbury was Secretary of the Treasury and William Noland Commissioner of Public Buildings overseeing both Treasury and Patent Office.

[39] Cost estimates included in the report were also solicited from Robert Brown, Robert Mills, and the "Committee on behalf of the Working Men on Public Buildings," whose leaders included James Baird, Thomas Boyd, and William Dougherty. William Dougherty, who had been employed in several of the early federal projects, including the Treasury and the Patent Office, would soon become Superintendent of Construction at the Washington National Monument.

York, on 30 June 1839.[40] This development had other consequences for Mills and his work. Robert Brown tendered his resignation effective 31 July 1839, citing a "very strong inducement held out to me" and "a sense of duty I owe to myself and my family to make the most of my time I can."[41] Brown was to be Masterton and Smith's agent in Washington.

Well-Laid, True and Trusty: Marble Construction for Public Buildings

On July 4th, 1848, President James K. Polk was present at the cornerstone dedication for the Washington National Monument.[42] Benjamin B. French, Grand Master of the Masonic Lodge of the District of Columbia, who would be appointed to the powerful post of Commissioner of Buildings and Grounds under the

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[40] Scott, *Guide to the Papers of Robert Mills.*

[41] Robert Brown to William Noland 8 July 1839, National Archives and Records Administration, RG 42: Public Buildings and Grounds.

[42] The architect of the monument, Robert Mills, had, by this time, lost considerable favor in Washington, having been dismissed as federal architect by Polk soon after he assumed the presidency. In the summer of 1847, Polk, accompanied by his secretary John Appleton, had toured Baltimore, Philadelphia, Boston by railroad and steamer and seen many examples of impressive public architecture, including Thomas Walter's Girard College library, which was constructed wholly of marble. Appleton noted that "there is no building probably in the whole union that can surpass the principal structure in the Girard group for its strength and stability as well as beauty and grace…its vast proportions, its elegant architecture and its perfect finish." Wayne Cutler, ed. *North for Union: John Appleton's Journal of a Tour to New England Made by President Polk in June and July 1847* (Nashville: Vanderbilt University Press, 1986), 16. Within a few years, Walter would become one of the preeminent architects involved in the federal buildings.

administration of President Lincoln, laid the official cornerstone, a 24,500 pound block of white marble from the Baltimore-area quarries of Thomas Symington.[43] Also near at hand, having helped ready the stone after its transfer from the Baltimore & Ohio railroad, where it had been transported free of charge in honor of the occasion, was William Dougherty. A master stonemason who had once worked on Mills's Treasury, Dougherty had been appointed the monument's Superintendent of Construction just a few days earlier.[44]

During the months surrounding the cornerstone ceremony, the Society had devised an ingenious marketing plan by which the interior walls of the monument were to be lined with donated stones. These were intended both to represent the natural resources of the United States and to signify the monetary donations of citizens in various cities and states. A formal notice to the governor of each state had invited him to submit a block of his state's finest marble or stone. The Society's fundraising efforts, which included an honorary network of state agents, were bolstered by the sale of a lithograph of the monument's design by popular printmaker Charles Fenderich.[45] A proclamation on these initiatives was issued by

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[43] Thomas Symington, 31 May 1848. National Archives and Records Administration, RG 42, Washington National Monument Society Papers, "Proceedings of and Letters Received Concerning Foundation, Cornerstone, and Stone for the Monument, 1848-53."

[44] William Dougherty to Elisha Whittlesey, 30 June 1848, National Archives and Records Administration, RG 42.

[45]The print was ordered from Fenderich in 1847. National Archives and Records Administration, Washington National Monument Society papers, RG 42. A copy of the

the Society's general agent, Elisha Whittlesey, on 20 October 1849.[46] The two-foot by four-foot "memorial" blocks requested by the Society were to carry inscriptions conveying patriotic ideals or attesting to a state or municipality's prowess. One hundred ninety three of these are now installed inside the monument. Among them are three stones representing the State of Tennessee: a block of the limestone from which the state capitol was constructed, and two marble blocks from Hawkins County.[47]

One of the first to send a memorial stone for the monument was architect William Strickland, who was living in Nashville while overseeing the construction of the Tennessee State Capitol. Perhaps he had read a notice in the newspapers, or heard about the "memorial stones" project directly from one of his contacts in Washington.[48] Whatever the case, Strickland wrote the Society on July 4, 1849 to inquire about shipping arrangements. Soon thereafter, he sent a block of the

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print can be found in the Tennessee State Library and Archives, "Washington Monument" folder.

[46]Ibid.

[47]Judith M. Jacob, *The Washington Monument: A Technical History and Catalog of the Commemorative Stones* (Department of the Interior, National Park Service, Northeast Region, Architectural Preservation Division, 2005), 28, 161, 163. http://www.nps.gov/wamo [accessed 9 October 2010].

[48] The following notice, which appeared in the *Washington Whig*, appears to have been copied verbatim and reprinted in the *Brooklyn Daily Eagle* on 9 May 1849: "Should the States be disposed to furnish stones, they must be of the following dimensions, viz: four feet long, two feet high, and one foot and six inches bed, with a front bevel of a quarter of an inch to the foot." Jacob, 8.

limestone being quarried nearby for the Capitol, inscribed, simply, "Nashville, Tennessee."[49] He must have acted almost immediately, for the Nashville stone, which is installed at the level of the second landing (40') of the monument, was one of the earliest received.[50]

The monument's architect, Robert Mills, was one of Strickland's peers. The two had apprenticed under Latrobe at the Capitol and both had vied for opportunities to remodel parts of that building in the intervening years. Strickland had also entered a design for the monument, apparently invited to apply in 1844 as part of a scheme envisioned by Zadock Pratt, Chairman of the Committee on Public Buildings and Grounds, who proposed to incorporate it into his planned federal monument square, which was never realized.[51]

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[49] A letter from Strickland conveying the stone is dated 1849. National Archives and Records Administration, Washington National Monument Society papers, RG 42, Box 1, Entry 439, "Letters Received Concerning Memorial Stones."

[50] A bill received by the Washington Monument Society in January 1850 from Baltimore's B. Buck & Sons requested payment for hauling a block that had arrived from Nashville. Jacob, 28. Blocks received between 1849 and the early 1850s were installed beginning at the 30 foot level and up to the 120 foot level before work was stopped at the monument in 1854-55. Tennessee's additional two blocks, although they were received in Washington in 1850 and 1851, had to wait until 1885 for installation. Today, they can be found at the 220 foot level.

[51] Freeman includes a lithograph of the design and cites Pratt's report to Congress as: 28th Congress, House Committee on Public Buildings and Grounds, Report 514, Joint Resolution 33, 25 May 1844. Robert Belmont Freeman, Jr. "Design Proposals for the Washington National Monument" *Records of the Columbia Historical Society*, (Washington, DC: The Society, 1973-74): 159-160.

It is interesting to note that Strickland's stone (figure 12) may have been received in Washington even before the Tennessee General Assembly's resolution of 13 December 1849 empowering Governor William Trousdale to make an official selection to represent Tennessee. Trousdale had initially delegated State Geologist Gerard Troost to make a selection "from the finest specimens of Marble in the State."[52] A letter from East Tennessee marble dealer Orville Rice, addressed to Troost, indicates that he was well aware of what would prove to be a major opportunity to promote his quarry.[53] Perhaps Rice had met Troost during the latter's visits to East Tennessee.[54] After Troost's death in 1850, however, the Governor appointed Daniel Graham, the former Tennessee Secretary of State and Comptroller of the Treasury, and more recently the Register of the U.S. Treasury under President Polk, to select the stone. Letters to Graham concerning the matter include one from marble dealer Orville Rice, of Hawkins County, in which he refers to an inkstand he had left with Mr. Strickland as an example of the dark variegated

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[52] Robert H. White, *Messages of the Governors of Tennessee*, 4 (1845-1857) (Nashville: The Tennessee Historical Commission, 1957), 400.

[53] Rice to Troost, 6 August 1850, Tennessee State Library and Archives, "Washington Monument" folder.

[54] A Letter from Troost, addressed to an unnamed gentleman, which was printed in the *East Tennessean* on 2 April 1839 referred to several samples of marble that he had examined. The addressee might have been Rice, his partner S.D. Mitchell, or an influential citizen from Hawkins County.

marble he hoped could be used for the official Tennessee stone at the Monument.[55] Rice also mentioned having already sent a light-colored block (figure 13) to Washington.[56] Rice also mentioned a trip to Washington that summer where he "saw nothing like it (the block already sent) from any state." Perhaps Rice was in Washington for the purpose of seeking a market for his variegated marble.

At the urging of the Society's Whittlesey, Graham recommended to Governor Trousdale that the State of Tennessee order a block of the darker marble from Rice.[57] This stone (figure 14) was received in Washington on 20 May 1851.[58] Reporting to the General Assembly in December 1851, Governor Trousdale described it as follows: "The slab is four feet long, two feet thick, and eighteen inches deep, of a dark chocolate color, highly finished, and with the following inscription: 'Tennessee—The Federal Union. It must be preserved.'[59] He reported: "The slab has

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[55] Orville Rice to Daniel Graham, 5 December 1850, Tennessee State Library and Archives, "Washington Monument" folder.

[56] The stone's presence in Washington was apparently noticed by a writer from the *Daily National Intelligencer* (7 August 1850) who called it "… beautiful variegated marble, polished in the finest style." Jacob, 163.

[57] Daniel Graham to William Trousdale, 21 December 1850, Tennessee State Library and Archives, Governor William Trousdale Papers; Orville Rice to Governor Trousdale, invoice dated 29 August 185, approved 20 September 1851, Tennessee State Library and Archives, RG 61, Comptroller of the Treasury.

[58] Jacob, 161.

[59] The original quote: "Our Federal Union! It Must be Preserved!" was a toast written by Andrew Jackson for a Jefferson Day Dinner, 13 April 1830, during the nullification controversy. According to an account obtained years later by a reporter for the *Nashville American* from an anonymous Jackson associate, the President suspected

been sent to the City of Washington, and the expenses paid, which amounted to three hundred dollars."[60]

Figure 12. "Nashville Tennessee," memorial stone, Washington Monument

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that Vice President John J. Calhoun would use the event to further his causes of complaint against the federal government. Jackson wanted to make his own position clear: that the issues at hand were not worth the risk of dissolution of the United States. *New York Times* 12 October 1883 www.NYTimes.com [accessed 8 December 2010]. President Martin Van Buren suggested that the word "federal" was added to the original toast by Jackson when he reiterated it for public distribution. Martin Van Buren, "Autobiography" II, ed. John C. Fitzpatrick, in *Annual Report of the American Historical Association for the Year 1918* (Washington: Government Printing Office, 1920), p. 415.

[60] Trousdale's Legislative Message to the 29th General Assembly was delivered 9 October 1851. White, 401.

Figure 13. "From Hawkins County Tennessee," memorial stone, Washington Monument

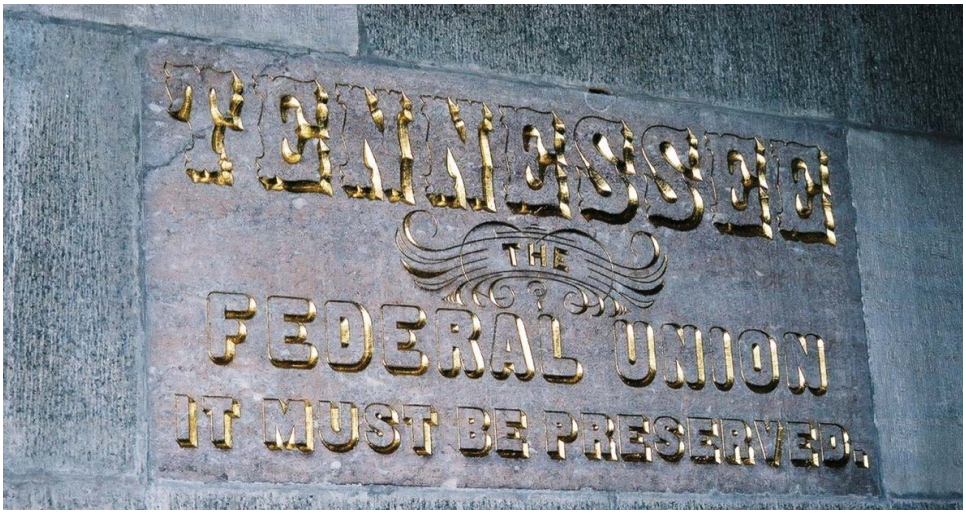

Figure 14. "Tennessee The Federal Union It Must be Preserved," memorial stone, Washington Monument

Coming from Tennessee, which had hosted the Nashville Convention on the Compromise of 1850 the previous year and played an important role in averting the

dissolution of the Union over the issue of slavery in the territories acquired after the War with Mexico, it represented the position of a state that saw itself as a political bellwether.

In Nashville, three years prior to the ceremony marking the commencement of construction for the Washington National Monument, dignitaries including Governor James C. Jones, Secretary of State John S. Young, Secretary of the Treasury Felix Zollicoffer, State Geologist Gerard Troost, and Mayor Powhatan W. Maxey had assembled to oversee placement of a cornerstone for Tennessee's new state house. The ceremony was held on July 4, 1845, on the northeast corner of Campbell's Hill, the highest spot in downtown Nashville.[61] It was a proud moment for the Capitol building commissioners and for the city of Nashville, which had been designated capital of Tennessee just two years earlier.[62] Since their appointment by the General Assembly on 30 January 1844, the commissioners, chaired by former Governor William Carroll, had wasted little time in recruiting prominent architect William Strickland and setting things in motion to begin construction. The appointed commissioners were prominent businessmen seemingly intent on increasing Tennessee's stature on the national scene. From the outset, they seem to

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[61] Survey form 19-51, Historic American Buildings Survey, Tennessee State Library and Archives.

[62] *Acts of Tennessee*, 25th General Assembly (1843-44), 1st session.

have desired a Greek Revival-style building. [63] Edwin H. Ewing's oration in which he acknowledged the current President, James K. Polk of Tennessee, underscored this theme.[64] After a prayer delivered by the chaplain of the Grand (Masonic) Lodge at Nashville, Grand Master Wilkins Tannehill deposited two sealed glass jars inside the cornerstone, and presented the mason's plumb, square, and lead to architect Strickland.[65] Following a long-standing tradition for the dedication ceremonies of American public buildings, in attendance were freemasons bearing banners showing the architectural orders and a contingent of the Independent Order of Odd Fellows. Strickland, too, was a freemason, according to Adolphus Heiman, a member of the Cumberland Lodge and one of few architects in Nashville at the time.[66] Heiman, who

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[63] Former Governor Carroll, chairman of the committee, may have presented the work of Louisville architect Gideon Shyrock, who came twice to Nashville and presented a design for the capitol. Gadski, 4. Commission members John M. Bass, Samuel D. Morgan, and William Nichol were also active in soliciting for an architect. Nichol, President of the Bank of Tennessee, probably knew Strickland's bank and Exchange buildings in Philadelphia. Ibid., fn 10; Morgan sent a letter to James J. Dakin, a prominent New Orleans architect, and Bass ultimately was the negotiator on Strickland's letter of agreement on 18 June 1845. Tennessee State Library and Archives, RG 7, Capitol Construction. The Commission, whose other members included Morgan W. Brown and James Erwin, voted 28 March 1845 to purchase a set of plans for David Paton's just-completed North Carolina State Capitol. Nell Savage Mahoney,"The Building of the Tennessee State House" (M.A. thesis, Vanderbilt University, 1939), 25.

[64]George Dardis, *Description of the Plan, Structure and Apartments of the State Capitol of Tennessee* (Nashville: G.C. Torbett & Co., 1855), 15. Dardis was the building's porter. His recollections may also have relied on a memoir written by Return J. Meigs, Tennessee's first state librarian.

[65] Ibid., 7.

[66] John E. Frank, "Adolphus Heiman, Architect and Soldier," *Tennessee Historical Quarterly* 5 (1946), 47.

had also submitted a design for the new capitol building, appears to have been most solicitous of the older architect, even supporting his son, Francis, in continuing the work after his father's death in 1854.[67]

The Tennessee State Capitol was to be built of gray limestone quarried less than a half-mile west of the building on the property of Samuel Watkins.[68] For the building's interior Strickland had called for "marble from East Tennessee" and, specifically, for "the columns of the Hall of Representatives and Senate Chamber to be of *variegated* marble, as well as all the decorative parts of the interior of the building.[69] Despite the overtures of Orville Rice, owner of the Hawkins County firm that had supplied the official Tennessee stone for the Washington National Monument, the interior marble contract went to a Nashville stonemason, a first-generation Irishman, recently-arrived, named James Sloan.[70]

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[67] Dekle, 218.

[68] Return J. Meigs, "Tennessee State Capitol," *Nashville City and Business Directory for 1860-61* (Nashville: L.P. Williams & Co., 1860), 38, referenced in Mary Ellen Gadski "The Tennessee State Capitol," *Tennessee Historical Quarterly* XLVII, no. 2 (1988), 116 (n. 6); Strickland's initial plan called for a stone exterior facing on brick interior walls. In 1848, the commissioners decided that the building would be constructed entirely of hewn limestone. Dekle, 220-1.

[69] Strickland to the Commissioners 20 May 1845, Tennessee State Library and Archives, RG 7,Capitol Construction.

[70] Chapter IV of this dissertation will chronicle the impact of Sloan's career on the Tennessee marble industry.

On July 4, 1851, another public dedication ceremony was held in Washington, D.C. This was for the enlargement and almost complete overhaul of the United States Capitol, which was known thereafter as the "extensions." President Millard Fillmore, a New York Whig who had been elected to Congress for two terms as a member of the Anti-Masonic party, had reluctantly agreed to allow the Masonic ceremony. Perhaps he was the one to insist that there be *two* cornerstones. The first of the two granite foundation blocks was to be laid by architect Thomas Ustick Walter. The second, to be placed on top of the first, would be set by Grand Master Benjamin B. French, after which he would present Walter with a square, a level, and a plumb—and a prayer for the architectural work.[71]

The new wings of the Capitol, as well as the original central portion, whose sandstone walls were deteriorating, were to be sheathed in white marble. The interior decoration was to be a variety of colored marbles—a great deal of which would be sourced in East Tennessee.

These three prominent buildings, intended to represent the successful establishment of representative government and the rule of law, were indeed symbols of republican virtue. Of refined architectural design, with limited, but appropriately classical detail, they were also practical, built to require little maintenance, and of fireproof construction. Their dedication ceremonies turned on the presence of Masonic dignitaries, who laid the cornerstones and made certain

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[71]Allen, *History of the United States Capitol*, 199-200.

that each building's foundation was "well-laid, true and trusty."[72] The patriotic Masonic association with all three buildings was connected to a cultural tradition that extended back to leaders of the early republic, but also inextricably tied to an admiration for the skilled artisans and mechanics whose workmanship produced permanent stone structures intended for the public good. By the 1840s, the growing debate over which building materials were most appropriate for government buildings had been resolved in favor of marble. Whereas both buildings in Washington, D.C. would be constructed of that material, the native Tennessee limestone to be used in Nashville had yet to be tested.

The Rage for Tennessee Marble: A Fashionable Interior Stone

Although Washington's new monument was built of white marble from Maryland, Tennessee's decorative interior stone became known because of its presence among the monument's "memorial" stones. The project's innovative fundraising strategy gave it national prominence—the inclusive nature of its participatory program reaching to East Tennessee, and beyond.

As early as 1833, a group of private citizens had organized for the purpose of building a permanent memorial to the first president. Most Americans considered a monument to George Washington, in the city that he founded, long overdue. The

[72] Ibid., 200.

new Washington National Monument Society had held a competition in 1836, from which they had chosen a design by prominent architect Robert Mills, but lack of fundraising delayed construction. The monument, which was to stand opposite the Capitol building, had originally been intended as a burial place. [73] Once the Society

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[73] One of the most vocal advocates for the re-interment of Washington had been President Andrew Jackson. When he visited Washington's tomb at Mount Vernon in 1815, Jackson had stated that its neglect reflected badly on an ungrateful nation and blamed Congress for not having moved decisively to obtain the remains. Letter dated 15 November, *Correspondence of Andrew Jackson*, John Spencer Bassett, ed. (Washington: Carnegie Institution, 1927). George Washington had left instructions for the building of a new tomb enclosure on his beloved plantation, expecting to be buried alongside previously deceased family members. His widow Martha Custis Washington, although mindful of her husband's desire for a new vault of brick at Mount Vernon, had at first acquiesced to the entreaty by Congress to move Washington's remains to the Capitol, where they would have been placed in the lower level crypt designed for this purpose. William Thornton, the President's friend and design architect of the Capitol, pled otherwise on her behalf, however, insisting that she had been placed in an untenable position and had agreed against her wishes. Within several years of Mrs. Washington's death, Capitol architect Benjamin Latrobe tried persuade Bushrod Washington, Washington's nephew and heir to Mount Vernon, to allow the remains to be reinterred in a suitable public place (by implication, the Capitol). After Bushrod Washington's death in 1829, the estate executor, Major Lawrence Lewis, also a nephew of Washington's, in recognition of mounting criticism of the state of the tomb, had the vault rebuilt with a stone doorway and iron door to prevent vandalism. As plans were laid for the new monument and hopes were again raised for re-burying Washington in the District of Columbia, Lewis accepted the offer of a handsome marble sarcophagus to replace the deteriorating coffin. Designed by architect William Strickland, the sarcophagus was a collaborative donation from Strickland and master mason John Struthers of Philadelphia. Mesick, Cohen, Waite Architects, *The Tomb of George Washington: Historic Structure Report Prepared for the Mount Vernon Ladies Association of the Union* (Albany, New York, 1993), 3, 5, 10-12. In a commemorative pamphlet published in 1840, Strickland described his arrival at Mount Vernon in October 1837, accompanied by Struthers. The two men found the tomb enclosure not only in disrepair but also inadequate to house the new sarcophagus, built of Pennsylvanian marble with a decorative carved lid of eagle, shield, flag, olive branches and arrows of imported Italian. Strickland attributed the decorative carving to "John Hill, one of Struthers' men. Soon thereafter, according to Strickland, Major Lewis ordered an enhanced and realigned

realized that the structure they contemplated would not encompass the tomb of the first president, it took over a decade and a change of leadership to re-invigorate the project. After some discussion and alterations, a final design was approved in November 1845 and sufficient money had been raised to begin.[74]

Robert Mills's original design, an obelisk inside a rotunda initially conceived as a final resting place for Washington, was only partially realized. When finally completed in 1884, the monument was a simple shaft topped by a pyramid-shaped aluminum capstone. Nonetheless, the stark white marble structure would quickly become an icon symbolizing the strength and integrity of the first leader of the American republic. Its planned height of five hundred feet made it a prominent architectural counterpoint to the Capitol dome, which set the height for buildings in the District of Columbia for many years.[75] Using large crystal white marble ensured

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tomb enclosure to be built, with an arched entrance and an iron gate through which visitors could view the tomb. William Strickland, *Tomb of Washington* (Philadelphia: Carey & Hart, 1840). While contracts exist for the work performed at the tomb enclosure in 1835, it seems highly probable that Strickland might have furnished Lewis a sketch a new tomb enclosure, since he is known to have made recommendations the practicality of a metal roof. Even so, the drawing of the structure has long been attributed to Lewis himself, with assistance from Alexandria brick mason William Yeaton, who was responsible for completing it in 1839. Mesick, Cohen, Waite, figures 4-6. However, Strickland ordered lithographs of of the tomb enclosure and the sarcophagus from printer P.S. Duval in Philadelphia. Since these were included in the commemorative booklet Strickland authored in 1840, I find it likely that he had a hand in both designs.

[74] Pamela Scott and Antoinette J. Lee, *Buildings of the District of Columbia* (NY: Oxford University Press, 1993), 100.

[75] The height was later adjusted to "ideal" proportions of height equal to ten times the base measurement. Robert Belmont Freeman, Jr. "Design Proposals for the

that it would glisten in the sunlight against its park-like setting. In a letter to the monument's Board of Managers, written ca. 1845, architect Robert Mills, by then a defender of marble, noted that this same material, also being used to face the new wings of the Patent Office, had been shown to have crushing strength equal to granite.[76]

The Superintendent of Construction for the monument, William Dougherty, an American of Irish parentage, had been born in Pennsylvania ca. 1815. Dougherty likely learned his trade from Irish stonemasons in either Philadelphia or Baltimore. He is known to have been working in Washington as early as 1836 and had married fellow Pennsylvanian Mary Bartle in Baltimore in 1838.[77] He seems to have risen

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Washington National Monument," *Records of the Columbia Historical Society* XLIX (Washington: Columbia Historical Society, 1973-74), 181. The final height of five hundred fifty-five feet made it the tallest building in the world until the erection of the Eiffel Tower—at nearly twice the height—in 1887.

[76] Mills reported to the Board of Managers that marble from the quarries of Thomas Symington near Baltimore, had been successfully tested in experiments carried out under the direction of the Secretary of the Interior at the Washington Navy Yard. National Archives and Records Administration, RG 42, Washington National Monument Society papers; Scott and Lee, 101. However, the minutes of meetings held in March and May 1849 at the National Institute, Smithsonian Institution, reveal communications questioning the choice of large "chrystal" marble for the monument. There appears to have been some doubt as to the durability of the chosen material. Although the Smithsonian Institution had authorized a comparative examination of building materials, it not yet undertaken such a study. Smithsonian Institution Archives, Record Unit 7058, National Institute, 1839-1863, Journals of Proceedings of Meetings.

[77] Dougherty's brother John, a Catholic priest in Baltimore, received condolences from the Washington National Monument Society upon William's death in 1867. National Archives and Records Administration, National Archives and Records Administration, RG 42, Washington National Monument Society papers.

quickly through the ranks—displaying leadership qualities that made him admired among his fellows. Dougherty's name can be found as one of the signatories (the letter contains three pages of signatures) of a 25 September 1837 letter to President Van Buren asking that workers on federal buildings be paid in the same fashion as their fellows at the navy yard and arsenal.[78] He was also an entrepreneur who saw the opportunity to profit from his masonry skills and use his first-hand knowledge of the growing marble trade. Listed as a stonecutter living in Washington, D.C. in the 1850 census, by the 1860 census he was calling himself a contractor, having accumulated both real estate and some personal wealth. By then he was involved in the marble business in Tennessee, working with Baltimore marble man Hugh Sisson to procure decorative interior marble from Tennessee for the United States Capitol and several state capitol buildings then under construction.[79]

One of Dougherty's first requests upon assuming the superintendent's position was that he be allowed to directly oversee the payroll for workers under his supervision. Dougherty's careful recordkeeping and the fact that he had been a leader among petitioners of grievances on previous projects are a testament to his character.[80] Correspondence files and reports found in the papers of the

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[78] National Archives and Records Administration, RG 42, Public Buildings and Grounds.

[79] Chapter IV of this paper will trace Dougherty's impact on the early development of the Tennessee marble industry.

[80] In October 1836, Dougherty was working at Mills's Treasury as a stone cutter earning $2 daily. By July 1837, he was earning $2.25 per day at the Treasury as a stone

Washington National Monument Society reflect Dougherty's willingness to stand up against the undue influence of contractors whose materials proved unsatisfactory.[81] The fact that he was included in a group of three federal stone workers asked to evaluate the question of marble vs. granite for Zadock Pratt's 1839 committee attests to the respect in which he was esteemed by his peers in the marble trade.[82]

The monument ascended steadily skyward as the work of skilled stonemasons, specialized stone setters, and ordinary laborers brought the building to a height of 164 feet by 1854, at which time construction was suspended until

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mason, working alongside other master masons James Baird, Alexander Rutherford, and William H. Winter. (Robert Mills papers, National Museum of American History Archives, payroll lists) On 25 September 1837, Dougherty was one of the signers of a letter to President Martin Van Buren from "we the mechanics on the public buildings" asking to be paid in "specie or Treasury drafts and not in depreciated Bank paper and shin plasters" and also be "permitted to partake of the crumbs of advantage that our fellow mechanics at the navy yard and arsenal receive," National Archives and Records Administration, RG 42, Public Buildings.

[81] Letter dated 10 August 1848 from Thomas Carbery, Chair of the Building Committee, to members P.R. Fendall, Peter Force, Walter Lenox. This letter concerned the complaint of William Easby, who had the contract for foundation stone for the monument. Duke University, William R. Perkins Library, Manuscript Division, Washington National Monument Papers. A copy of this letter can be found in National Archives and Records Administration, RG 42, Washington Monument Society.

[82] A 13 February 1839 letter from Philadelphia marble masons John Struthers and Adam Traquair was addressed to James Baird, William Dougherty, Thomas Boyd, Committee, Washington, D.C. who had apparently been charged with soliciting professional advice on the question of cost and practicality of using marble for buildings in Washington. House Document 221, 25 February 1839, House of Representatives, 25th Congress, 3rd session, also Report No. 305.

more funds could be raised.[83] Although the circumstances surrounding the change of auspices for the monument remain unclear, the Know-Nothings (a nativist, anti-immigrant party—one of those that took up the mantle of the Whig party upon its dissolution in the 1850s) took over its construction beginning sometime around early March 1855, causing William Dougherty and most if not all of his labor force to vacate their posts for nearly two years.[84]

The backlash of Know-Nothing sentiment, which was also anti-Catholic, struck many of the Irish workingmen in Washington.[85] While the Know-Nothings

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[83] A measure of the steady progress being made on the monument can be found in Knoxvillian Robert H. Armstrong's 1851 diary entry reporting the height at ninety feet. R.H. Armstrong, *Private Journal and Jottings Down In and Out of Prairiedom*: *Nov. 8, 1850-Sept. 15, 1851,* Knox County Public Library, McClung Historical Collection, MS 917.63; A letter from William Dougherty to Thomas Carbery on 28 September 1854 reported on the status of the work and stated that his workers were willing to continue until the end of the year without pay in order to use as much of the ready materials on the ground as possible, with the understanding that they would be paid from future funds raised by the Society. National Archives and Records Administration, RG 42, Washington National Monument Society.

[84]Two satirical reports in the *Washington Star* on 10 March 1855 and 12 March 1855 chronicle the plight of William Dougherty, who attempted to continue to work at the monument even after a new board of managers had taken over. The writer wondered whether the new superintendent, a blacksmith who was also a member of the board of managers, intended to finish the monument in iron. A report on 15 March 1855 stated that Dougherty had been forcibly rejected from the building.

[85] Margaret H. McAleer, "'The Green Streets of Washington:' The Experience of Irish Mechanics in Antebellum Washington," *Washington Odyssey: A Multicultural History of the Nation's Capital*, ed. Francine Curro Cary (Washington: Smithsonian Books, 1996): 42-44, 48, 166. McAleer has calculated that by 1818 nearly half the population of Washington was made up of Irish laborers, many of whom identified themselves as carpenters or stonemasons. A group of Irish indentured servants had been brought over in 1784 to improve the navigation on the Potomac River and by 1786

(who apparently knew nothing, or at least very little, about stone masonry) were attempting to continue construction of the monument, Dougherty went to work on the extension of the General Post Office and on the new wings of the Patent Office. He was already acquainted with both Thomas U. Walter, by then the architect in charge of all of the federal building projects, and Montgomery C. Meigs, a captain in the U.S. Topographical Engineers, who was assigned to the Capitol Extensions to oversee procurement of materials and labor.[86] In 1853, while still employed at the

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Irishmen were at work on the Great Falls Canal (an early segment of the Chesapeake & Ohio) leading into what would soon be the city of Washington. The builder-architect James Hoban, who needed skilled workers for the President's house, had suggested that there were many fine stone artisans in Dublin. While a group of Scottish masons was recruited from Edinburgh for that project, whether a similar effort was made to recruit skilled Dubliners remains an open question. Nonetheless, McAleer's research on Irish artisans in the building trades indicates that the majority of stone workers in the early decades of the Capitol construction, where Hoban served as supervising architect in the early days, may have been Irish. These Irish laborers, apprentices, journeymen, and master mechanics fused easily with the spirit of the age—identifying with the republican conception of labor and believing themselves equals with native-born artisans. They joined such early labor organizations as the "Association of Mechanics and Other Working Men" in 1830. Those who had brought their artisan skills to Washington, like William Dougherty, felt themselves to be agents of change. In a letter to President Jackson, asking for resumption of building projects on the public works after the panic of 1837, the Association stated: "the wisdom and patriotism of a nation reside with its industry." In the already-cited letter to Jackson's successor, Martin Van Buren, approximately one hundred twenty signatories sought "the advantages allowed to others of our countrymen … free men, members in common of the same family … paying our devotions at the Altar of Liberty erected by our Fathers, and rendering our support to the Republic Institutions established by them." Van Buren apparently listened to these mechanics and workingmen and instituted the ten-hour workday (first demanded in Philadelphia) for workers on federal projects.

[86] A confidential letter from Thomas U. Walter to John Rice, a partner in the Philadelphia Marble firm Rice, Baird & Heebner, on 2 May 1855 notes: "Dougherty is app. at the Post Office. He was kicked out of the Monument by the No Nothings hence it

monument, Dougherty was apparently operating as a private contractor. Correspondence between Walter and Meigs indicates that Dougherty was interested in furnishing Tennessee marble for the interiors of the U.S. Capitol.[87] Exactly when Dougherty might have traveled to Tennessee to arrange for the purchase or lease of a quarry is unclear, but it must have been sometime between his first acquaintance with the Tennessee memorial blocks in 1850-51 and the publication of Meigs's advertisement for interior marble at the Capitol on 4 May 1853. Walter formally issued a "bill" for the first quantity of Tennessee marble on 6 October 1853.

Once appointed Foreman of Marble work at the General Post Office Extension in 1855, Dougherty answered directly to Meigs, who sent him almost immediately on a quarry-inspection trip in the northeastern states.[88] Since the monument was a

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seems important that he should be provided for. He is a Catholic also." Office of the Architect of the Capitol, Thomas U. Walter letterbook.

[87] On 30 September 1853, T.W. Walter wrote Capt M.C. Meigs: "Mr. Dougherty is desirous to have an order for marble for the interior of the Capitol, and I have made out the enclosed bill which embraces all that I think it would be safe to order until the details have been made the subject of further and more deliberate study." The attached "bill" detailed the number and size of blocks of both light and dark Tennessee marble to be used in the interior of the Senate Chamber and the Hall of Representatives. Office of the Architect of the Capitol, Thomas U. Walter letterbook. A formal cover letter to Meigs from Walter and a more detailed "bill" dated 6 October 1853 can be found in Office of the Architect of the Capitol, RG 43.

[88] William Dougherty's report to Captain Meigs on 5 June 1855 stated that the purpose of the trip was to find suitable marble for the (exterior) construction of the Post Office building. He traveled to New York City, Philadelphia and environs, the Hudson River Valley and upstate to Troy and Albany, NY: Rutland, VT; Pittsfield and Lee, MA, and Baltimore from 21 May to 5 June, then made a similar trip from 24 June to July 4. He identified only four specific quarries in West Chester County, NY; Sutherland Falls, VT; Lee, MA; and Baltimore, MD as being able to supply marble of the quality needed

private, non-governmental enterprise, it may not have been subject to the same sort of public scrutiny that was to afflict Walter and Meigs over contracts for labor and materials at the Capitol. Even after being engaged at the Post Office, however, Dougherty continued to furnish Tennessee marble for the Capitol.[89] Perhaps expert marble men and their wares were so much in demand that the question of conflict of interest did not arise in Dougherty's case, or in that of Alexander Rutherford, the Foreman of Marble Work on the Capitol Extensions, who sought outside work at the Post Office extension in 1857.[90]

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and in enough quantity for the project. Office of the Architect of the Capitol, RG 40, Other Public Buildings, Post Office Extension.

[89] Also evidence of that is a letter from Dougherty to Meigs on 26 June 1856. Found in the correspondence files, Post Office Extensions, it does not carry Dougherty's usual title, Foreman of Marble Work, Gen Post Office Ex. and appears to be about a matter of personal business: "Sir, I expect a load of Tennessee marble to arrive today or tomorrow. Owing to the teams about the city being engaged I am unable to get it hauled at present & it cannot be left on the wharf without being removed out of the way of the crane, which would make it very expensive to load on the wagons hereafter. Mr. Burns informed me that after today your teams will have nothing of any account to do until another marble vessel arrives. If you would allow the Government teams to haul it, I am willing to pay any price you may think proper and it will be a great favor to me." Meigs wrote "approved" across the back of the letter. Office of the Architect of the Capitol, RG 40, Other Public Buildings, Post Office Extension.

[90] Alexander Rutherford to Capt. M.C. Meigs 20 November 1857: "Sir, I will furnish delivered at the extension G.P.O. 9200 lineal feet Italian marble skirting similar to the skirting used at extension U.S.C." Office of the Architect of the Capitol, RG 40, Other Public Buildings, Post Office Extension.

Nashville's Acropolis

For the Tennessee State Capitol in Nashville, William Strickland's design of a Greek temple-form embodied the architect's belief that the proportions of Greek architecture were symbolic of strength and wisdom.[91] The aging Strickland—one of the best-known architects on the national scene—had been recruited by a building commission intent on elevating Nashville's status by erecting a building that reflected the latest in architectural taste.[92] His patrons sought to build a monument that would not only give an impression of permanence and but also reassure citizens of the state's sound governance.

The Tennessee Capitol Building Commissioners were both visionary and stubbornly pragmatic. While they desired the utmost in quality, they were bent on

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[91]Christine Kreyling, *Classical Nashville: Athens of the South* (Nashville: Vanderbilt University Press, 1996), xiv.

[92] Other architects considered by the Commissioners include James Dakin of New Orleans and Gideon Shyrock of Louisville. Both of these purveyors of the Greek revival style were already working in the western section of the United States. Another indication that the Commission had already settled on a style for the building is the fact that they ordered and presumably studied the architectural plan for the North Carolina state house, which had originated as a cruciform-shaped building designed by local architect William Nichols, Jr., into a central-porticoed Greek-influenced design by New York architect Ithiel Town. Under supervising architect David Paton, who had worked in London for John Soane, the structure was more fully developed into a Palladian-influenced tripartite façade but with a strict Greek entablature and a Doric-columned, Greek temple portico. Mahoney, "The Building of the Tennessee State House," 25-26. Paton, who took over the project in 1835, consulted William Strickland for confirmation of his choice of Greek details. Catherine W. Bishir et al, *Architects and Builders in North Carolina: A History of the Practice of Building* (Chapel Hill: University of North Carolina Press,1990), 164-167.

the strictest economy, which meant that Strickland had to turn to what was local and available. Their campaign to build in solid stone, with no brick used in interior walls, made it imperative to recruit skilled stoneworkers.[93] The architect's wish for top quality craftsmen was tempered by the lack of qualified masons in the city. An ad in the Nashville *Whig* 10 July 1845 sought stonemasons. Strickland hoped to attract some of those skilled masons who had been employed at the newly-completed North Carolina state capitol to Nashville.[94] Patrick McGowan wrote to Commissioner John Bass on 25 August 1846, stating that he had worked seven years at Raleigh and was interested in moving to Nashville.[95] Presumably he was joined by others. In his proposed letter of agreement with the Capitol Commissioners, however, Strickland seemed resigned to the prospect of using prisoners to quarry the stone, citing cost savings to be gleaned—obviously aware of the desire of the General Assembly to put those in the penitentiary to useful labor.[96]

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[93] Mary Ellen Gadski, "The Tennessee State Capitol: An Architectural History," *Tennessee Historical Quarterly* XLVII, no. 2 (Summer 1988), 67.

[94] According to historian M. Ruth Little, most of the seventy or so stonemasons employed under architect David Paton in Raleigh, the majority of whom were from Scotland, Ireland, and England, moved on after the building's completion. M. Ruth Little, *Sticks and Stones: Three Centuries of North Carolina Gravemarkers* (Chapel Hill: University of North Carolina Press, 1998), 195.

[95] "Strickland Papers" Tennessee State Library and Archives, cited in Nell Savage Mahoney "William Strickland and the Building of Tennessee's Capitol, 1845-1854," *Tennessee Historical Quarterly* IV, no. 2 (Nashville: Tennessee Historical Society), 123.

[96] William Strickland to "the Commissioners" 20 May 1845, RG: 7: Capitol Construction, Tennessee State Library and Archives.

The commissioners had consulted with the warden of the penitentiary about a suitable quarry for the State to lease or purchase from which the exterior stone for the building could be obtained. Since the original plan had been to build in brick faced with stone, they easily secured a lease on a nearby limestone quarry belonging to brick contractor Samuel Watkins—who anticipated a forthcoming contract to furnish brick. Watkins later claimed additional compensation for the lease, citing both the facts that use of the quarry had lasted longer than anticipated and that the hoped-for contract had never materialized.[97]

Strickland's May 1845 proposal had made clear that he knew the General Assembly might require use of prison labor as a means of cost-saving.[98] While a good deal of the quarry work could be done by prisoners, the setting and masonry work required skilled artisans, a few of whom might have been found in the population of prison inmates or among the number of African American slaves hired from local owners.[99] In 1845, Secretary of State John S. Young had recommended

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[97]Mahoney,"William Strickland and the Capitol," 127-8.

[98] William Strickland to "the Commissioners" 20 May 1845, RG: 7: Capitol Construction, Tennessee State Library and Archives. The Acts of the 26th General Assembly, 1st session (1845-46), Section 1, record that the Commissioners would have authority to use "the labor of the convicts of the Penitentiary" but "not more than 120 out of 189 shall be employed on said Capitol." The following year, the 27th General Assembly granted permission for a detail of 30 convicts to work at the quarries and (under guard) at the building under supervision of the architect.

[99] The Capitol building records include several documents related to hiring African American men in 1845, 1846, and 1847. The first of these, an invoice from A.G. Payne covering the months of June to September 1845, lists 67 African American men and boys and reveals that about one quarter of the men had "cost" 46 cents per day as

bringing on a work force of fifteen to twenty "active and intelligent" young African American men to be housed on the premises and attend to any number of duties.[100] For the decorative carving work, Strickland apparently managed to hire a small number of the skilled immigrants (twelve Irishmen, five Germans, and one Frenchman) who had been employed at the North Carolina state house under Paton.[101] I have not found a list of the stoneworkers, but perhaps they are included on a docket of quarrymen, shop attendants, and stonecutters dated 10 July 1854.[102] Although speculation as to national origin based on surnames alone remains just that, it is interesting to note that among the fifty-two stonecutters, five (Martin Moor, Arch Young, Ivy, Duke, and Spencer) are identified as "negro." The others,

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opposed to 14 cents for the others. The second, also with Payne, dated 1846, agrees to furnish "15 able bodied negro men at $18 per month … to board said negroes and furnish a woman to cook for them … and also to board any hands (negroes) the Committee may employ at $1 per week. The Committee to furnish nothing but a house for them to eat and sleep in." On 29 November 1847, Strickland estimated the number of stone workers needed for the following year as "70 stonecutters @ $624/year, 2 stone setters at the same wage, and 8 negro laborers @ $100 per year." Tennessee State Library and Archives, RG 7, Capitol Construction.

[100] Mahoney, "William Strickland and the Capitol," 122.

[101] Dekle, 223. Dekle relied for a good deal of his information on the documents collected in volume IV of White's *Messages of the Governors*, in which a reader can follow a continuing discourse upon the use of convict labor to best purpose, and how best to integrate it (or not) with free and slave labor. For example, on 15 September 1845, Secretary of State John S. Young (serving under Governor Aaron Brown) stated that of 135 able workers currently in the state penitentiary, 10 were good stonecutters (whose work he would estimate being worth a wage of $1.25). For work by the others, including 20 who had had some experience in the business, he estimated a value of 75 cents per day. White, Volume IV, 67.

[102] Tennessee State Library and Archives, RG 7, Capitol Construction.

then, presumably, are white men. This list includes such traditionally Irish names as Donahoo, McCartney, O'Bryen (2), Casteel, McCarns, Kelley, and Doolin. Possible German or Prussian names on this list might be: Rupp, Prusfininskey, Burk, Lazenbury, and Raby. Some of the remaining number, who likely had their origins in the British Isles, included Griffin, Harrison, Cash, Yates, Kind, Goad, Grooms, Miller, Howard, Philips, Jones, Mills, Black, Dyer, Mitchel, Avery, and Webb.[103]

It would be several years, however, before the marble for the interior finishes would be required. In December 1851, Hawkins County marble dealer Orville Rice gave the commissioners an estimate of $23,750 to furnish, finish, and install the interior marble. No "bill" specifying the quantity of East Tennessee marble needed is known to exist, nor is there any evidence that the contract for the marble was publicly advertised. Rice, who was known to Strickland and others in Nashville because of his role in furnishing the official Tennessee stone for the Washington National Monument, stated that he had met with Strickland and looked at the drawings and designs. He must have been eager to secure the contract, for he

[103]In *Architects and Builders in North Carolina*, Bisher noted that big building projects like the North Carolina state capitol in Raleigh drew a number of British and other European skilled workers into the state. At one time, the project employed more than three hundred. However, this population was highly mobile, with many moving out of the state in search of land or further opportunity. During the decade from 1850 to 1860, in Wilmington, for example, while the overall population of men engaged in the building trades increased, only a small fraction of those who appeared in the 1850 census can still be found in residence in 1860. Bisher et al, 184-185.

reduced his estimate by $2,700 four days later.[104] Rice's original calculation may well have been inflated by uncertainty about the cost of transportation from east to west, which was not yet possible by train and difficult by water because of persistent navigation problems on the Tennessee River below Chattanooga.

In 1850, the way had been opened by railroad from the Tennessee River to the east coast via Charleston. For the Washington National Monument, Rice had hauled the two- foot by four-foot marble blocks from Hawkins County to the Tennessee River, then boated them to Chattanooga, to be carried by train via the Western and Atlantic Railroad to Charleston where they had been transported by schooner to Washington. But in late 1851, the Nashville & Chattanooga Railroad, which would later provide a direct route between the two cities, was still under construction, and the prospect of portaging a heavy load of marble overland around the shoals of the Tennessee River and then arranging a connection by railroad may have been daunting. Hoping, perhaps, that the influential commissioner (some of them railroad investors) might be able to come up with a solution to the transport problem, in February 1852 Rice revised his proposal once again: he proposed to furnish the marble in rough blocks, delivered to any point above the "Mussell Shoals" on the Tennessee river by flatboat, for $4,500.[105]

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[104] Rice to the Board of Capitol Commissioners 16 December 1851, "Strickland Papers," Tennessee State Library and Archives, cited in Mahoney, "William Strickland and the Capitol," 143.

[105] Rice to the Board of Capitol Commissioners 13 February 1852, Ibid.

Four days after Rice's final proposal, on 17 February 1852, Commissioners John Bass, M.W. Brown, and Samuel D. Morgan executed a contract with Nashville marble mason James Sloan, which called for Sloan to:

> Do all the stone and marble work of the Platforms, Screen work, desks, tables and ornamental work of the Speakers Chair of the Hall of Representatives, and of the Senate Chamber together with the Columns for the Support of the Gallery in this Chamber." Sloan was also to: "find all the materials for the above work out of East Tennessee marble of the most fanciful variegation, except the steps and platforms which may be of limestone, to be approved by the Architect, which work is to be executed and set up in a workmanlike manner, according to the Plans, Elevations and Specifications … made a part of this contract … according with the instructions of the Architect.[106]

The contract granted Sloan the sum of $12,839 for work to be completed on or before the 1st of July 1853. How the 38 or 39-year-old Sloan planned to transport the marble to Nashville is not known. Nor, apparently, had he any firm plans about where he was going to obtain said East Tennessee marble. A letter from Sloan to John Bass, written 28 February 1852, less than two weeks after his contract was signed, finds Sloan in Knoxville looking for marble. His salutation "Friend Bass," as well as the informality, undisciplined penmanship (unusual for the time in official documents, which were characteristically transcribed by a skilled hand prior to signature) and frank tone of the letter suggest that he may have had some sort of an inside track on the job.[107] Perhaps Bass, a banker whose son-in-law was President of

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[106] Tennessee State Library and Archives RG 7, Capitol Construction--Contracts.

[107] Tennessee State Library and Archives, RG 7, Capitol Construction--Marble, Plastering, Pumps.

the Nashville & Chattanooga Railroad, or Morgan, a Nashville industrialist and also a railroad man, saw an opportunity to invest in Sloan's fledgling marble business. Sloan, who appeared in the 1850 census as a stonecutter, was not listed in the Nashville Business Directory for 1850. Yet, by 1854, he had opened a "Steam and Marble Works" on Market Street. In the 1857 directory, Sloan's Steam Marble Works, now located at the corner of Spring and Summer Street, advertised "inexhaustible marble quarries at Knoxville, East Tennessee (the finest known in the United States, and perhaps equal to any in the world)."[108] Sloan received at least one (perhaps more than one) additional contract for marble inside the new State Capitol. On 7 June 1855, he contracted to furnish the principal stairway balusters and handrails for $2800, with a $500 bonus for completion by 1 October. He estimated the cost of furnishing mantels, as drawn by the architect's son, Francis W. Strickland, at $150 each on 12 October 1854. In all, Sloan would be paid $16,198 for interior marble workmanship and materials.[109]

The complex pool of workers involved in the construction of the Capitol, a mixture of forced and free African American labor, first or second generation native Tennesseans, skilled immigrant workers of various levels of education, and prison inmates, must have been one of the major challenges of Strickland's project. However, there is little in the public record or in the Capitol Construction files at the

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[108] Rev. John P. Campbell, *Nashville Business Directory*, III (Nashville: Smith, Camp & Co., 1857), 190.

[109] Mahoney,"William Strickland and the Capitol," 144.

Tennessee State Library and Archives to indicate that he met it with anything other than the utmost professionalism. Strickland did have his difficulties with the General Assembly, however, over cost overruns and slow progress. In retrospect, the construction project was likely encumbered on both counts by the bureaucracy and bookkeeping associated with the use of penitentiary labor. The architect nearly lost his post in late 1853, saved by only one vote. But in a testament to the fickle nature of politics, a vote later that same session accorded him a burial place in the Capitol's basement vault.[110]

It is interesting to note, however, that within three weeks of Strickland's death on 6 April 1854, the stonecutters at the quarry had apparently formed a labor association and were demanding written guarantees that they would remain employed on the building until March 1855. They also asked that they have some say about what aspects of the work were to be performed on the penitentiary premises. A report by the new secretary in the Office of Commissioners noted that when their demands were rejected, the stonecutters discontinued their labor.[111] However, according to appended newspaper columns, which were published in the

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[110] White, IV, 609-610.

[111] On 31 March 1854 Samuel D. Morgan had assumed the chairmanship of the committee and taken the title of president. Four days later James Plunket was hired as secretary. While Francis Strickland, with assistance from Adolphus Heiman, provided architectural oversight during the building's final stages, Plunket would become the building's superintendent upon its completion. Gadski, 77. The Commission report, a handwritten day-by-day account, may have been compiled after the building's completion from files and journals kept by the secretary. Tennessee State Library and Archives, RG 7, Capitol Construction.

Daily Evening News (11 May 1854, signed by Members of the Stone Cutters Association) and the *Daily Gazette* (14 May 1854, signed "Our Mechanics") the issue that caused the workers to strike was the Commission's decision to take the legislative appropriation for the completion of the Capitol and use it to actually pay for the labor at the penitentiary, retaining only twelve of the stone cutters on the work force. The group expressed outrage at the actions of the Commission, reporting that most of what was left to be completed was ornamental work. They noted that before his death, "Major" Strickland had had the designs "dressed" so that the work might continue as soon as the Legislature had approved funding for the completion of the building at its next session. They referred to the "flattering inducements" that had brought them to Nashville originally. Stating that their skills required years to master, they feared their jobs might be turned over to convicts who could thereafter present themselves as experts in the profession. It is apparent, from their detailed account of the actions of the legislature with regard to appropriations for the capitol and the contract situation at the penitentiary, that this group was not only closely following the politics but also felt confident in their right to appeal to public opinion to right the matter. In short news items published during the height of the work stoppage in May 1854, they also showed the courage of their convictions by calling out two of their members. The Stone Cutters Association indentified Thomas Murphy and George McNaught as scabs who had broken the strike by going back to work at the Capitol.

A solution to the crisis came during the summer. When the workmen petitioned for a twenty-five cent rise in the daily wages, Governor Andrew Johnson heard their plea. As an ex-officio member of the Commission, Johnson prevailed upon that body to honor the request, which passed unanimously that summer.[112] Upon assuming the office of governor, Johnson had decried the expenditure being heaped upon the "magnificent State edifices … presenting all the grandeur of carved and massive columns which architectural ingenuity can invest or display … which will, all in all, when completed … cost the people of the State not less than a million and a half or two million of dollars." He believed that public education should be the state's priority. But he believed equally in the working men and supported the mechanics employed at the Capitol who resented having to work alongside, and in some cases actually provide instruction in the building trades to, the penitentiary inmates.[113]

Thus, the Commissioners' gamble in trying to undermine the stone workers seems largely to have failed. Relying solely on penitentiary labor for the stonework resulted in delays and wasted the time of those still employed on the building. In one notable instance, master masons refused to carve a prototype of one of the columns in order that a less skilled worked might emulate their work, thus further

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[112] Gadski, 78.

[113] "Andrew Johnson's Legislative Message," 19 December 1853, White, 546-547; 552-553.

inhibiting the progress. To add insult to injury, a fire at the penitentiary on 18 March 1855 destroyed $6,000 of rock prepared for the Capitol.

From the glowing entry Plunket recorded upon completion of the building on 21 July 1855, however, one can assume the labor issues well and finally settled:

> Saturday. This day at 3 oc PM was placed in position the capping stone or last stone on the tower. The event was announced to citizens by hoisting the American Flag on the tower and firing a salute. On the 4th of July 1845 the cornerstone was laid, ten years and 17 days were thus required to erect the Capitol, a building that will favorably compare with any in the world, in chasteness of design, solidity of material, elegance of workmanship, and adaptability to the purposes it was intended for. When we reflect on the time consumed in the erection of public buildings in older and more favored countries where skillfull and experienced mechanics abound, as for instance St. Pauls Church London that required thirty two years for its completion it will be concluded that the erection of the Capitol of Tennessee in ten years will stand as a monument to the energy and good management of the Commissioners appointed by the Legislature to Superintend its construction as well as to the memory of its architect Wm Strickland and to the fidelity and skills of the mechanics and workmen that have this day given to the People of Tennessee a Capitol of which they may be justly proud.[114]

Since James Sloan was presumably operating as an independent agent, with his own men and machinery at work on the Capitol, the interiors would have been less affected by the labor unrest. No evidence has yet been found of Sloan's position in the matter.

[114] Tennessee State Library and Archives, RG 7: Capitol Construction.

Tennessee Marble in the Corridors of Power: The Capitol Extensions

Thomas U. Walter, the architect appointed to oversee construction of the U.S. Capitol Extensions, was one of a number, including his architectural mentor Strickland, who had submitted designs for new chambers for the House and Senate.[115] These important meeting halls were to be more commodious, acoustically superior, and better ventilated than the rooms traditionally used by the Congress. Walter was one of four finalists, including architect Robert Mills, who were chosen after a call for designs was published on the 30th of September 1850. Perhaps at the behest of the committee, which had advertised its right to do so in advance, Mills had drawn a plan incorporating some of the best features from each. President Fillmore, who had been given the authority to make the choice in the authorizing legislation, appointed Walter, who was sworn in as Architect of the Capitol Extensions on 11 July 1851.[116] Walter's design called for the enclosure of the chambers in new wings connected to the north and sound ends of the original

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[115] Representative Daniel D. Barnard, New York, had called for a room that would better accommodate the meetings of the House as early as March 1843. In January 1844, Col. J.J. Abert, U.S. Corps of Topographical Engineers, delivered a report to the 28th Congress (Doc. 51, 28th Congress, 1st session) with contained cost estimates and two drawings by William Strickland. Homer T. Rosenberger, "Thomas Ustick Walter and the Completion of the United States Capitol," *Records of the Columbia Historical Society* 50 (1952), 279-280.

[116] Ibid., 281-283.

building by long hallways and a taller dome to be better balance the expanded proportions of the building.

With the Whig Party in power in Washington, the free enterprise spirit of the times and public expectation of accountability meant that public notice of business opportunities connected to any large federal undertaking was required. One of Walter's first acts as architect was to propose a change in labor arrangements for workmen on the federal architecture projects.[117] Rather than take on a large temporary workforce at the Capitol, he advocated using a contract system of outsourcing—putting out bids not only for materials, but also for the work as a whole or in part. As he explained in a letter to President Fillmore on 29 July 1851, Walter believed that shifting the supervision of workers to a company or companies with pecuniary interests in completing the work on time and on budget would save money, as it had at Girard College.[118]

Walter authorized placement of an advertisement soliciting marble for the exterior construction in a number of newspapers on Sept. 19, 1851.[119] According to historian James Goode, not only was the Capitol Extensions project extremely well documented, the awarding of contracts was of enormous interest to many. Furthermore, recent improvements to the transportation infrastructure

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[117] Walter's responsibilities quickly grew to include overseeing new wings at the Patent Office and Post Office buildings.

[118] Rosenberger, 288-289.

[119] Allen, 204.

theoretically opened the market to long-distance bidders since materials could now be brought from a great distance by railroad or steamboat.[120] While at first neither the Secretary of the Interior nor the President saw the need for a separate contract for the stonework itself, after a few months at work on the building, when delays in the arrival of materials idled the workers, they understood Walter's reasoning and acceded to his request by granting a separate contract for cutting and setting the stone on site.[121]

Eighteen bids to furnish exterior marble were received from businesses in Maryland, Massachusetts, New York, and Pennsylvania. In an attempt to be both politically prudent and to ensure the permanence of the new structure, the Secretary of the Interior appointed a committee to conduct scientific engineering tests on the submitted marble samples. The Committee included Walter, General Joseph G. Totten, U.S. Army Corps of Engineers, and Joseph Henry, Smithsonian Institution. However, they reported their results as inconclusive, allowing that scientific knowledge of the period was insufficient for the impartial comparison of various types of marbles. In order to gauge the potential effects of weathering, however, the Capitol committee arranged a series of tests measuring such qualities

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[120] James Moore Goode, "Architecture, Politics, and Conflict: Thomas Ustick Walter and the Enlargement of the United States Capitol, 1850-1865" (Ph.D. diss., George Washington University, 1995), 68.

[121] Ibid., 86, fn 13. A contract for cutting and setting all of the marble for the Capitol Extensions went to the firm of Provest & Winter, Washington, D.C. on 12 July 1852.

as density, crushing pressure, and absorption. Three marbles were judged acceptable by these measures, and the Committee chose a white marble from Lee, Massachusetts, ostensibly because there was a sufficient quantity easily available for the project.[122]

In 1853, partly due to the intense scrutiny over these and other lucrative contracts connected with what would be the largest single building project in the nation for decades to come, the Capitol Extensions project was moved from the jurisdiction of the Department of the Interior to the province of the War Department. Architect Thomas Walter, who, like Robert Mills before him, had suffered the vicissitudes of several politically-motivated investigations into various aspects of his work, including the awarding of contracts for the Capitol, had requested that President Franklin Pierce, a Democrat, relieve him of the administrative duties related to procurement of materials. When Pierce shifted responsibility for the Capitol to the War Department, he appointed the ambitious young Montgomery C. Meigs, Captain, U.S. Army Corps of Topographical Engineers, to work alongside Walter. At first, Walter welcomed the opportunity to turn his attention solely to architectural matters. Although Meigs at first followed closely in Walter's footsteps, he was not content merely with overseeing contracts and procurement of materials. As an engineer, he was interested in building materials

[122] The contract for furnishing exterior marble from quarries in Lee, Massachusetts for the Capitol Extensions was awarded to Rice, Baird & Heebner, Philadelphia, 17 January 1852. Goode, 205.

and methods. He was very proud of the mechanized marble sawing equipment at the Capitol. When he had the opportunity to begin acquiring materials for the building's interior, he contacted Secretary of War Jefferson Davis and found that the marble testing committee first constituted in 1851 to evaluate the building's exterior marble had been reorganized to include Brig General J.G. Totten, and Professors Joseph Henry and A.D. Bache.[123] While he continued the practice of quality testing initiated and adhered to other practices Walter had set out for the building program, Meigs soon revealed himself as one who planned to contribute not only his engineering skills but also his own design ideas to the building.

Whereas Walter had notified newspaper editors directly, promising several of the papers with national circulations payment for running his advertisements for exterior construction materials for the building, Meigs took a more obviously political course of action as he began to seek marble for the interiors. His "advertisement" was entered into the official records of Congress as House Document 1, dated 4 May 1853. With the headline "Marble for Extension United States Capitol," Meigs addressed his plea "To owners of Marble Quarries," requesting that six-inch square block specimens be sent directly to his office. No deadline for receipt of samples or call for specific bids was included. The announcement suggested that editors of country papers in known or suspected

[123] Jefferson Davis to Montgomery Meigs, 4 January 1854. Architect of the Capitol, RG 43, Box 28.

marble areas would do their constituents a favor by running it for free while major newspapers would be reimbursed for running the ad weekly for three months.[124]

On 6 October 1853, Thomas Walter drafted a "bill" specifying how much Tennessee marble would be needed for "embracing pilasters around galleries of Senate and House, the architrave on top and the paneling between the 4 grand stairways."[125] Even though no Tennessee newspapers are known to have run the ad, at least one person proposed to furnish Tennessee marble. Meigs reported, on 22 October 1853, that the most beautiful of all of the marble samples received in response to his advertisement was from Tennessee and that a quantity of it had been ordered.[126] Meigs notes in his handwritten journal that on 31 December 1853, G.W. Jones of Tennessee came by his office to look at the specimens of marble he had left.[127] George Washington Jones was a Democratic congressman who represented Tennessee's Fifth District, mostly Middle Tennessee, from 1843-1859.[128] Apparently in response to a second inquiry regarding Tennessee marble, Thomas Walter wrote

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[124] *Congressional Record* 4 May 1853.

[125] Architect of the Capitol, RG 43.

[126] House Executive Document 1, part 2, 33rd Congress, 1st Session.

[127] *Capitol Builder: The Shorthand Journals of Montgomery C. Meigs, 1853-59, 1861*. Wendy Wolff, ed. (Washington: U.S. Government Printing Office, 2000), 37.

[128] Jonathan M. Atkins, "George Washington Jones," in *Tennessee Encyclopedia of History and Culture*, Carroll Van West, ed. (Nashville: Tennessee Historical Society, 1998) http://tennesseeencyclopedia.net [accessed 29 October 2010].

to the Hon. William M. Churchwell, also a Tennessee congressman, on 27 January 1854, stating that there had been:

> No abandonment of the contract for Tennessee marble and no contract in the strict sense of the term. [There had been] an order for furnishing 2000 feet of that marble to a W. Dougherty at a stipulated price, but that is but a small portion of what will be required, of ornamental marble. [Obviously aware of the potential danger of being accused of closing the bid process to interested bidders prematurely, he added:] This office is open for offers and samples of every description of American marble, and we intend to employ as great a variety as may be consistent with good taste … there is therefore room enough for your constituent, irrespective of the purchase already made, provided the material he may offer to furnish is desirable, and reasonable in price. I inclose (sic) you a copy of the advertisement of the Engineer in Charge, in reference to marble, and it will be well for your friend to send us a sample in accordance thereto.[129]

Churchwell was a prominent citizen of Knoxville, where several marble businesses, in addition that being operated by James Sloan, were already in operation.[130]

Another intriguing Tennessee connection is the presence, in the Architect of the Capitol's correspondence files regarding bids for stonework and marble, of an unaddressed note, written in Washington on 16 February 1855 by Nashville-Knoxville marble dealer James Sloan, who offered "to furnish and deliver the best

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[129] Architect of the Capitol, Thomas U. Walter letterbook. William Montgomery Churchwell.

[130] William Montgomery Churchwell, a Democrat, represented the Second and, later, the Third Congressional District (East Tennessee) from 1851-1855.
Knox County, where Sloan's business interests lay, was included in Churchwell's district. Dougherty was sourcing his Tennessee marble in the upper East Tennessee County of Hawkins, in Tennessee's First Congressional District. This distribution of Tennessee Congressional Districts in 1852 comes from White, 517.

quality of East Tennessee red variegated marble in the city of Washington."[131] In his handwritten journal, Meigs reported on 16 February 1855: "Mr. Zollicoffer came in … very anxious to have a chance to supply some of his marble for the Capitol. Says he will send it for less than Doherty (sic) … I thought that I might perhaps make the columns and pilasters in the Senate Retiring Room of his marble. It is the same in appearance as Doherty's (sic). He says that he will have a railroad passing within ¼ mile of his quarry, which will enable him to send direct by rail to Savannah in the spring."[132] Meigs was probably referring to Tennessee congressman Felix Zollicoffer, originally from Maury County, in Middle Tennessee, who was elected first as a Whig to the Thirty-third Congress, then from the American Party to the Thirty-fourth and Thirty-fifth Congresses. He served in Washington from 1853-1859. James Sloan may well have accompanied Zollicoffer on his visit to the Capitol, but there is no

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[131] Architect of the Capitol, RG 43.

[132] *Capitol Builder*, 225. Depending upon the location of the quarry in question, this proposed railroad might have been either the East Tennessee & Georgia or the East Tennessee & Virginia coming through Knoxville. The East Tennessee & Georgia, which entered Knoxville from the southwest, was the first of these to be completed. Opened in June 1855, it spanned the distance from Dalton to Knoxville by way of a new railroad bridge at Loudon, connecting at Dalton to the Western & Atlantic, continuing southeastward to Augusta, Savannah, and Charleston. Construction on the East Tennessee & Virginia Railroad did not actually begin until 1856. The Nashville & Chattanooga railroad, which had been completed in 1854, required portage from Bridgeport, Alabama to Chattanooga before continuing on the Western & Atlantic line to Savannah and Charleston. Burns, 235; Davis, 124; Bonnie L. Gamble "Nashville and Chattanooga Railroad," *Tennessee Encyclopedia of History and Culture*, Carroll Van West, ed. (Nashville: Tennessee Historical Society, 1998) http://tennesseeencyclopedia.net [accessed 4 December 2010].

contract or other confirmation that Sloan ever furnished marble for the building, nor any indication of Zollicoffer's having been a quarry owner.[133]

Pressure from Tennessee congressmen notwithstanding, William Dougherty seems to have had the edge in the contest to see who would furnish the desirable decorative marble for the Capitol interior. He is mentioned as early as 20 July 1853 in a letter from Thomas Walter to John Rice (of Rice, Baird & Heebner, that firm that had received the contract to furnish exterior marble for the Capitol Extension in early 1852). Walter told Rice he had contacted Mr. Dougherty at the "monument" to see how to obtain the Tennessee marble.[134] Because of his visible career on public works in Washington, Dougherty not only knew Walter and, through him, Meigs, but also knew at least two of the partners in Provest and Winter. He had worked alongside William H. Winter at the Treasury and knew Thomas Symington who had furnished the marble for the Monument. Through his connections in Philadelphia, he might also have become acquainted with other marble dealers there in addition to Struthers and Traquair.

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[133] A Southern Claims Commission petition on behalf of James Sloan indicates that he had an interest in a quarry in Dickson County, just west of Nashville, during the years just prior to and during the Civil War. Perhaps Zollicoffer, a Maury Countian who died commanding a Confederate regiment at the Battle of Mill Springs, KY, in 1862, and Sloan shared a business interest in a marble business in Davidson, Dickson, or Knox Counties.

[134] Philadelphia Athenaeum, Thomas U. Walter letters, referenced in unpublished document, "A Chronological History of the United States Capitol," by Ann Kenny, Architect of the Capitol (1999), 52.

Thomas Walter was also a close associate of William Strickland, who had been an important mentor to the younger man when both were in Philadelphia. He was probably well aware of some of Strickland's choices of furnishings for the Tennessee State Capitol. The furnishers of ironwork (Wood and Perot) and gasoliers (Cornelius and Beebe) for both buildings were Philadelphia concerns. Strickland may also have influenced Walter in the choice of Tennessee marble as interior stone but it seems more likely that the latter just responded wholeheartedly to the Tennessee memorial stones he had seen at the Washington National monument. In a recommendation written at the request of William Dougherty some five years later, Walter recommended the stone as "more solid and compact, and free from shakes and dry joints than any other variegated marble I have ever seen, and it is susceptible of a more brilliant polish."[135] Walter stated more than once that he thought the Tennessee marble unequaled for interior beauty.[136] In an 1860 letter to the Emperor of Japan, Walter wrote a paragraph to accompany a marble sample presented to the Emperor by Alexander Provest, of Provest, Winter & Co. He described it as the material of which "three of the grand stairways are constructed,

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[135] Architect of the Capitol, Thomas Walter to Mr. William Dougherty, 28 September 1858, Thomas U. Walter letterbook.

[136] Allen, 240.

each of which cost over $300,000 … It is brought from the State of Tennessee, where it exists in great abundance [and] is a pure marble."[137]

Although he referred to the Tennessee marble as a pure marble, it is clear from previous correspondence that he understood the different types of marble and limestone. On 16 June 1854, he sent an acquaintance (My Dear Anderson) some pages from one of the detailed reports of mineralogical experiments taking place in Washington. Walter remarked: "what is curious in this matter is that we experimented on the stone for the Capitol more perfectly than had ever been done before, adopted it, and had the house half built before we found out that the beautiful marble we were using is no marble at all; but fortunately it has turned out that it is far better than marble." Walter went on to explain what many other architects would ultimately come to understand very well: that magnesian, or Dolomite, limestone (of which the Lee, Massachusetts marble chosen for the Capitol Extensions is a prime example) actually tested harder and more durable than pure marble and would function just as well.[138] Nowhere in the internal correspondence or related business documents at the Capitol Extensions was concern raised about qualitative geological differences in the types of "marble" for employed on the interiors. And there was never a suggestion that the Tennessee Marble ordered for the building's staircases, balustrades, wainscoting, mantelpieces, mirror frame

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[137] Architect of the Capitol, Walter to His Imperial Majesty, 30 May 1860, Thomas U. Walter letterbook.

[138] Architect of the Capitol, Thomas U. Walter letterbook.

panels, or door and window trim was anything other than the finest available. A letter from Walter to contractor Alexander Provest called one of the Capitol stairways "good enough to eat," continuing, with obvious pride: "not only is it the best job in the world but Major Bowman says 'it is the best ever will be made.'"[139]

By the mid-1850s, politics, science, and the seemingly unending promise of abundant natural resources that continued to reveal themselves as the American frontier moved westward, had coalesced to favor the rise of Tennessee's marble industry. The colorful polished marbles of East Tennessee were much admired in the halls of the new United States Capitol. Architect Thomas Walter continued to endorse the marble to colleagues and others, even years later. William Dougherty, who had first encountered Tennessee marble at the Washington National Monument, had gone into the marble business hoping to make money through his connections to the Hawkins County quarries. Meanwhile, as more quarries were opened in Tennessee, it became apparent that the richest and deepest veins of marble were located further south, near Knoxville. Local and national businessmen had begun to take notice by the 1850s. With the resumption of railroad commerce after the Civil War, the Knoxville-based marble industry would launch itself into a period of prosperity that would sustain it well into the next century.

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[139] Thomas Walter to "My Dear Provest," 11 August 1857, Architect of the Capitol, Thomas U. Walter letterbook.

CHAPTER IV

THE POLITICAL ECONOMY OF MARBLE

In December 1859, prompted by recent events at Harper's Ferry, U.S. Senator Andrew Johnson of Tennessee delivered a speech designed to quash the argument being made by one of his fellows (Illinois Senator Lyman Trumbull) that justification for anti-slavery efforts could be found in the Declaration of Independence or the Constitution. Quoting a table comparing free vs. slave states, which Johnson attributed to "an editor in St. Louis," he hoped to demonstrate that the presence of slave labor in the South was no detriment to free labor. Standard daily payments for painters, bricklayers, stonemasons, carpenters, plasterers and laborers revealed that day-wages in the slave states, with very few if any exceptions, exceeded those in "free" states.[1]

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[1] No date or exact source for the wage table is given. For the purposes of this study, it is interesting to note that, although a wage spread was provided, the daily rates for stonemasons in the slave states varied from a low of $1.75 in Louisville to a high of $3.50 in Nashville. In the free states, the rate for a stonemason was not only lower across the board, but also varied less dramatically, from $1.25 in Buffalo and Cincinnati to $2 in Bangor. However, Washington, D.C., New York City, and St. Louis, cities which were, or would soon be, major centers of employment for stoneworkers, were not included in the survey. Andrew Johnson, "Speech on Harper's Ferry Incident," 12 December 1859, *The Papers of Andrew Johnson,* III (1858-60), Leroy P. Graf and Ralph W. Haskins, eds. (Knoxville: University of Tennessee Press, 1972), 336-337.

Further advancing his argument, which rested on the Constitution's recognition of slaves as property, Johnson concluded that any challenge to the institution of slavery was actually an assault upon the Constitution. To make the point, he cited the Washington National Monument as a visible symbol of the confederation of states. In a rhetorical question for those "bent upon the idea of universal liberty," he wondered whether they would have the "audacity or the impudence to come upon slave territory" (by which he meant Washington, D.C., where slavery was still legal) and "lay their hands upon all the pledges to the Union and Constitution which compose … the shaft that has been reared in this District in commemoration of the illustrious Washington." Furthermore, would they "take the block of marble deposited by Tennessee, which has inscribed upon its surface the sentiment of her illustrious son who now sleeps in his grave—'The Federal Union, it must be preserved?'"[2]

By singling out this block of marble (that, not incidentally, came from Johnson's East Tennessee home district) and linking it to the monument, he touted the continuing fidelity of southerners, especially Tennesseans, to the cause of the Union. The reference to the monument equated the carefully crafted image of the new nation with the federal buildings that had been erected in Washington, D.C. over the past few decades, demonstrating the powerful political symbolism of architecture. In using a visible icon linked to the most widely revered American of the day, combined with a quotation from Andrew Jackson, the first President elected

[2] Ibid, 340-341.

from his home state of Tennessee, Johnson hoped to shock listeners into believing that the actions of the abolitionists and their supporters would tear apart the hard-won accomplishments of federal government.

His reference to the Tennessee stone may also have been a dig at the former Whig party, whose once-national constituency had dissolved in the anti-slavery controversy but whose surrogates were still powerful in Tennessee and elsewhere.[3] The reference to possible theft or desecration of the stone was very definitely a reminder of the recent lawlessness that had prevailed in Washington, when, in March 1855, the Know-Nothings (one of the successor groups to the Whig party) had taken over construction of the monument. They had strong-armed Superintendent of Construction William Dougherty and forced him to vacate the premises. And they had physically removed, destroyed, or thrown into the Potomac

[3] The Whig party, which carried Tennessee in the 1840 election that brought William Henry Harrison to power, emerged during that decade as the party of progress for would-be industrialists, favoring federal funds for internal improvements, a departure from the "political spoils" associated with the patronage system begun under Andrew Jackson, and federal control of a national bank. That same year, "Lean Jimmy" Jones, who would later be one of the primary champions of railroad building in the state, defeated democrat James K. Polk for the Tennessee governorship. And back and forth it went, over these and other issues of federal vs. state sovereignty. Even after Polk's ascendance to the presidency, Tennessee remained a pivotal battleground for the two parties. In the 1850s, when the Whigs became too closely associated with the northern abolitionist movement, the American or Know-Nothing party took its place in Tennessee. Andrew Johnson, who defeated a Whig opponent in Tennessee's 1853 governor's race, was nearly defeated two years later by Know-Nothing Meredith P. Gentry when he ran for reelection in 1855. Jonathan M. Atkins, *Parties, Politics, and the Sectional Conflict in Tennessee, 1832-1861* (Knoxville: University of Tennessee, 1997), 115-18, 195-205.

River a block of marble sent by the Vatican—on the basis that the worldwide Catholic Church represented a threat to American sovereignty.[4]

After being relieved of even his part-time duties at the monument (a lack of funds by the Society in late 1854 had necessitated a slow-down of the work even before the Know-Nothing "coup") Dougherty, himself an Irish-Catholic, had begun in earnest to pursue more lucrative projects.[5] Having already secured a contract to furnish Tennessee marble for the Capitol, he returned to the ranks of federal employees by landing a position of authority on the Post Office extensions.[6] Soon, he would also be furnishing Tennessee marble for the South Carolina State House as an independent contractor.

Tennessee's Early Marble Men

Joining William Dougherty's story to those of Orville Rice and James Sloan, two marble men already active in Tennessee, and another, Montroville W. Dickeson, who was prospecting for business around Knoxville, demonstrates the interconnectedness of political and economic factors during the industry's early development. While there are others who noticed and wrote about marble to be

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[4] *Washington Star* 10 March 1855 and 12 March 1855.

[5] Dougherty to Carbery, 28 September 1854, National Archives and Records Adminstration, RG 42, Public Buildings.

[6] Walter to Rice 2 May 1855, Architect of the Capitol, Thomas U. Walter letterbook.

found in Tennessee, and some may already have been quarrying it in small amounts, the activities of these four individuals stand out in the historic record.

The geologic explorations and publications of Tennessee's first state geologist were of critical importance in opening the industry in Hawkins County. Having first noted the presence of marble in several locations in East Tennessee in an 1831 report to the General Assembly, Dr. Gerard Troost sent a much more detailed description to an anonymous gentleman in Rogersville (probably Orville Rice) on 27 August 1838. Referring to "the specimens of marble you handed me, when I visited last Spring East Tennessee, and those which you have sent me since," Troost described the various marble samples, concluding: "I do not know any European or Egyptian (as some Italian marbles are here called) equal in beauty with the Tennessee marble, as well for its variegations as for its polish."[7] Troost's successor, James M. Safford, reported that the Rogersville Marble Company, founded in 1838 under the direction of Orville Rice and S. D. Mitchell, had been the first in the state.[8]

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[7] *East Tennessean* (Rogersville) v. I, no. 1, 2 April 1839. See chapter I for an account of earlier published mentions of East Tennessee marble.

[8] J.M. Safford, *A Geological Reconnoissance of the State of Tennessee, being the author's First Biennial Report presented to the 31st General Assembly of Tennessee, December 1855, by James M. Safford, A.M., State Geologist, Professor of Natural Science in Cumberland University, Lebanon, TN.* (Nashville: G. C. Torbett & Co., 1856), 107. Henry R. Price stated that Rice opened a quarry on Caney Creek in 1839 under the name of Rogersville Marble Company. Henry R. Price, *Hawkins County, Tennessee: A Pictorial History* (Virginia Beach: Donning, 1987), 162.

Orville Rice, born in Connecticut around 1794, is listed in the 1830 Rogersville census as a farmer. He owned sixteen slaves by 1840. By 1860 he had amassed real estate valued at over $60,000 and a personal estate of more than $120,000.[9] According to an article in the first issue of the *Railroad Advocate*, a newspaper founded in Rogersville in 1831 to support local efforts to build a railroad, Rice was a member of the committee charged with trying to move the issue forward.[10] He was a drug store owner who sold patent medicines from the late 1830s to 1855, as well as a community leader.[11] A bondholder in the Bank of Tennessee at Rogersville in 1838 and 1848,[12] Rice was involved in organizing a school at Rogersville by 1838, was a principal member of Hawkins County Lodge 41, IOOF, by 1848; and by 1849 was engaged in the purchase of a sixty-six acre parcel intended for a female academy.[13]

In 1844, Rice apparently bought out his partner, S.D. Mitchell, to become the sole owner of the marble business.[14] Anticipating success, Rice built a three-story

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[9] U.S. Bureau of the Census (Washington, DC), *Fifth Census* (1830), *Sixth Census* (1840), *Eighth Census* (1860).

[10] *Railroad Advocate* 1(Rogersville, Tennessee), 4 July 1831.

[11] Price, *Hawkins County, Tennessee: A Pictorial History*, 235.

[12] Tennessee State Library and Archives, RG 47, Bank of Tennessee, 1838-65.

[13] Price, *Hawkins County, Tennessee*: *A Pictorial History*, 35.

[14]A Stockley D. Mitchell is listed as Cashier of the Bank of Tennessee, Rogersville, in 1838. Tennessee State Library and Archives, RG 47, Bank of Tennessee, 1838-65, Box 2, Folder 5. The United States manuscript census for 1850 lists an S.D. Mitchell in Hawkins County as a 55-year-old farmer owning $7200 in real estate. Still living at home

brick mansion several miles west of Rogersville near Mooresburg in 1848 and named it Marble Hall.[15] Apparently Rice used Marble Hall as a showplace for the marble floors, doors, windowsills, and mantelpieces made by his company.[16] Three years later, an advertisement for the marble factory of Rice & Edmonds in the *Rogersville Times* announced that they had opened new quarries "of very superior marble" and "one of the partners having had more than twenty years experience in some of the best establishments in Europe and the Eastern Cities," they could furnish "monuments, both plain and ornamental," as well as "marble mantels, centre tables, side tables, bureau tops, vases" from their address at "Marble Hall, Hawkins

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was a son named Stockley. A somewhat less likely but also possible partner for Rice might have been the Samuel D. Mitchell described in a memoir written by John Fain Anderson. Anderson's uncles had come from Maryland to work on the East Tennessee & Virginia Railroad in 1852. Anderson's memoir mentioned that Samuel D. Mitchell was a charter member and director of the East Tennessee and Virginia railroad along with Anderson's uncle, John Hammer Fain. Archives of Appalachia, East Tennessee State University , John Fain Anderson papers, "East Tennessee Virginia and Georgia Railroad." Perhaps coincidentally, Rice's Nashville competitor-to-be, James Sloan, would take a partner named Mitchell around 1857 in Nashville, styling the company "Sloan & Mitchell's Steam Marble Works." The Mitchell in partnership with Sloan in 1857 was A. Mitchell, an apparently temporary resident whose address is given as the St. Cloud Hotel. Mitchell does not reappear in successive business directories, nor is the Sloan & Mitchell advertisement repeated in the 1859 directory. Reverend John P. Campbell, *Nashville Business Directory* (Nashville: Smith Camp & Co., 1857), 142, 190.

[15] The 1864 map "East Tennessee North of Loudon" prepared under the direction of Capt. O.M. Poe, Corps of Engineers & Chief Mil Div of the Mississippi, from data furnished by Capt. O.M. Poe and Professor J.M. Safford, shows a quarry (the only one indicated even though this map also included Knoxville and environs) near Mooresburg as well as the designation "Marble Hall or Rice's." Tennessee State Library and Archives.

[16] Price, *Hawkins County, Tennessee: A Pictorial History,* 160.

County, Tenn."[17] Rice's marble factory, which used water-powered machinery and employed at least six persons, was the only establishment listed under marble in the United States *Census: Manufactures* for Tennessee in 1850.[18] Rice promoted his business within the state and on the national level and had met the architect William Strickland in Nashville.[19] In answer to the request of the Washington National Monument Society for memorial blocks, both sent sample stones. When Rice's Tennessee marble attracted particular attention, he had traveled to Washington to size up the potential competition in decorative marble from other states.

Yet, ambitious as he may have been, without direct railroad lines into Rogersville Rice's business remained dependent upon wagon and flatboat transportation. To get the monument stones up to Washington, he had likely floated them by flatboat down the Holston and Tennessee rivers to Chattanooga and railroaded them to Charleston for transport up the east coast by schooner to Baltimore. Soon it would be possible to transfer from boat to rail much closer to the source, at least at Knoxville or Loudon, where a bridge would be built and railroad

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[17] *Rogersville Times,* 16 January 1851.

[18] U.S. Bureau of the Census, *Seventh Census: Manufactures* (Washington, DC: 1850), 127.

[19] In a letter addressed to Professor Gerard Troost, dated 6 August 1850, Orville Rice mentioned having left a marble inkstand with Mr. Strickland and also some pieces with Mr. Bass [John M. Bass was a member of the Tennessee State Capitol Building Commission], which would, presumably, attest to the color and quality of marble in his Hawkins County quarries. He stated that he had already furnished a block of light-colored marble for the Washington National Monument and suggested sending an additional stone of the dark variegated type. Tennessee State Library and Archives, Washington Monument folder.

lines would intersect the Tennessee River by 1855. But in 1852, either because he lacked political connections in Nashville or because of the difficulty of transport for west-bound freight, Orville Rice's Rogersville establishment lost the bid to furnish interior marble for the new Tennessee State Capitol. The contract was awarded instead to James Sloan, a first-generation Irishman from New York, listed for the first time in Nashville in the population census of 1850.

By 1854, Rice also had competition in his own backyard from William Dougherty. Several years after the arrival of the Hawkins county stones at the Washington National Monument, Dougherty had "opened" a quarry about nine miles southwest of Rogersville, near Mooresburg, close to the Holston River.[20] In 1855, James Safford mentioned that a government agent had come to Tennessee to inspect the marble.[21] Perhaps it was Dougherty, who may have visited the Hawkins County quarries by way of introductions furnished by Orville Rice, whom he had likely met in Washington in 1850 when Rice traveled there to see the sample stones sent by other states. An account written nearly twenty years later implied that Rice

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[20] Goodspeed, 268.

[21] "An agent was soon sent by them to ascertain whether or not it could be obtained in quantity, who, when on the ground, had no difficulty in satisfying himself as to this point. As the result of these circumstances, an extensive quarry, affording an excellent material, has been opened at a point about nine miles southwest of Rogersville, where the Holston River intersects the marble range … many thousand cubic feet of marble have already been sent off. It is taken, for a part of its route, down the river, and then by railroad to Charleston or Savannah, where it is shipped for Washington City." Safford, *A Geological Reconnoissance*, 108.

facilitated Dougherty's entrée into the quarry business in Hawkins County.[22] Perhaps Rice's failure to capitalize on early advantage was due to circumstances surrounding the Civil War. Not only was railroad service in the area disrupted, Hawkins County historian Henry Price has suggested that Rice's land may have been confiscated by federal agents in the area after the war because he had been sympathetic to the southern cause.[23]

Whatever the case, in 1854 Dougherty was corresponding with East Tennessee landowner Andrew Galbraith of Rogersville about a quarry on Galbraith's land, and substantial amounts of marble were already being shipped to Washington under Dougherty's auspices.[24] From one or both of these quarries, Dougherty and

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[22]"… variegated marble first introduced into our notice by venerable and esteemed friend, Orville Rice, but left to Wm Dougherty, father of present owner, to introduce it so extensively in U.S. The marble used in interior of U.S. Capitol and State House, Columbia, SC, was from this quarry." *Morristown Gazette,* 13 Nov 1872.

[23] Price has written that Rice's land was sold at auction in 1867 and that a neighbor, James Gouldy, purchased it and ultimately restored it to Rice. The United States manuscript census for 1860, 1870, and 1880 listed James N. Gouldy as a farmer in the 10th district of Hawkins County. In 1860 Gouldy, age 34, owned real estate valued at $3200 and had an estate valued at $2000. Curiously, the 1870 figures showed Gouldy owning real estate valued at only $2500 and having an estate worth $1000. A Hawkins County property deed recorded an 1872 sale from Goudy to Mary B. and Edward A. Dougherty (widow and son of William Dougherty). H.B. Stamps Memorial Library, Rogersville, Tennessee, Vertical file.

[24] A hand-carried letter from William Dougherty, Washington, D.C., to Mr. Andrew Galbraith of Hawkins County introduced Mr. Galbraith to the bearer, a Mr. William Canning, who "comes out to take charge of the Quarry in place of Mr. Roberts." Dated 15 June 1854, this letter suggests that there was an already-established relationship (regarding a quarry) between Dougherty and Galbraith. Letter courtesy of Tennessee Books and Autographs, George E. Webb, Jr., Rogersville, Tennessee.

Baltimore marble man Hugh Sisson obtained the marble used for many interior features, including three staircases and the walls of the handsome Senate Retiring (or "Marble") Room, in the United States Capitol Extensions.[25]

While Rice may have opened the way for Dougherty to develop a market for Tennessee marble in Washington, how had new Nashville resident James Sloan managed to snatch the plum contract to furnish interior marble for the Tennessee State Capitol away from Rice? For one thing, Sloan had had either the brilliant instinct or the sheer good fortune to invest in a quarry near Knoxville, where the East Tennessee & Georgia railroad heading south and west to a connection with the Nashville & Chattanooga railroad would soon be completed.

In 1853, a good portion of the Nashville & Chattanooga was finished and the East Tennessee & Georgia was running at least halfway to Knoxville. In Nashville, the first city directory, which was compiled by the Reverend John P. Campbell of Charleston and published in 1853, somewhat prematurely announced the railroad's completion to Charleston.[26] Campbell's city directory enterprise is an example of the kind of civic boosterism that was rampant throughout the region as southerners struggled to keep up with the expansion of transportation networks in the Northeast and Midwest. Although it was possible to make one's way by a series of rail connections on the Nashville & Chattanooga through Tennessee, into northern

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[25] Allen, *A History of the United States Capitol*, 238, 303.

[26] *The Nashville State of Tennessee and General Commercial Directory*, I (Nashville: Daily American Book and Job Printing Office, 1853), vii.

Alabama, and by way of a detour by boat across the Tennessee River, to join with the Western & Atlantic running through North Georgia to Savannah and Charleston, the through route to Chattanooga would not be finished until 1854.[27]

The 1853 directory, which listed four marble yards operating in Nashville, is one of the first publications to include marble businesses in Middle Tennessee. Advertisements in two Nashville newspapers several years earlier reveal the presence of at least two and perhaps several predecessor companies. The *Nashville Daily Evening Register* (28 December 1848) carried an advertisement for the Cincinnati firm of Lowry & Rule. A year and a half later (15 July 1850) the same newspaper contained a listing for Rule, Hitchcock & Co., "supplier of marble tombstones, monuments, bureau-tops," on the corner of Spring and Summer Streets. An earlier advertisement that same year, for Rule, Sloan & Company, in the *Daily Centre-State American* (22 May 1850) suggests that James Sloan, for a short while anyway, may also have been in business with the Rule firm. Another advertisement in that newspaper (3 August 1850) evidenced an additional competitor: the Nashville Marble Works. All four firms listed in the 1853 directory were located in downtown Nashville. Two were on Summer [later Fifth Avenue]: Shelton & Ham, Marble Manufacturers, and James Sloan, Importer and Dealer in Marble and Stone, who also had an address on Market [later Second Avenue]; and two on Cedar [later

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[27] R.S. Cotterill, "Southern Railroads and Western Trade, 1840-1850," *The Mississippi Valley Historical Review*, v. 3, no. 4 (1917), 434; Bonnie Gamble "Nashville and Chattanooga Railroad," *Tennessee Encyclopedia of History and Culture,* Carroll Van West, ed. (Nashville: Tennessee Historical Society, 1998), 767-8.

Charlotte Avenue]: J.B. Johnson's Nashville Stone Dressing Company, and H. Henderson, Importer and Manufacturer of Marble and Stone.[28] A much earlier description of early industry, an 1834 compilation of Tennessee place names, mentioned a Nashville-area quarry along the Harpeth River and a marble warehouse in the city, but did not identify the owners of either business.[29]

By 1850 James Sloan was rapidly advancing his business in Nashville. He is recorded as a stonecutter in the manuscript census of 1850 for Davidson County, a master marble cutter by 1860, a marble cutter in 1870, and a stonemason in 1880. In 1855, Sloan had two establishments: one at 84 S. Market Street, and a "wareroom" at the corner of Summer and Spring [later Church] Streets in Nashville.[30] By 1856, he was involved with the Sligo Marble Manufacturing Company in Knoxville, which was reported to have been capitalized with $200,000, quite a considerable sum for the Tennessee marble business at this early date.[31] And he had somehow had amassed sufficient capital to invest in a Knoxville marble quarry.[32] In 1857, Sloan was specializing in East Tennessee marble as proprietor of

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[28] *The Nashville, State of Tennessee, and General Commercial Directory,* I, 73.

[29] *Eastin Morris' Tennessee Gazetteer 1834* (Nashville: Robert M. McBride & Owen Meredith, The Gazetteer Press, 1971), 7-8.

[30] The listing in this directory reads: "James Sloan, Marble and Stone Manufacturer, Large Stock on Hand." Reverend John P. Campbell, *Nashville Business Directory II*, 1855-56 (Nashville: Printed for the Author, 1855), 107.

[31] Anonymous, *Plough, the Loom and the Anvil*, 8 no. 9 (1856): 570.

[32] Property deeds in Knox County record that Sloan purchased six acres of land from Thomas Rodgers, a private individual, in early January 1856, which he sold ten days

"Sloan & Mitchell, Wholesale & Retail Dealers in Marble, Monuments, Tombs, Mantels &C &C. Corner of Spring & Summer Streets, Nashville, Tenn."[33] Sloan apparently maintained the business on the corner of Spring & Summer during the Civil War, as well as a stone quarry adjacent to the recently opened Nashville & Chattanooga Railroad depot, which was located at the western terminus of Spring Street.[34] The caption of a newspaper photograph of unknown date showing a marble yard next to a multi-level brick building, with the headline: "Masonic Temple

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later to the Sligo Mining and Marble Company (a Knoxville firm incorporated in 1854), along with the machinery for dressing and polishing marble that he had been using on Market Street in Nashville. Knox County Archives, Warranty Deeds, Book U, v. 2, 11 January 1856; 21 January 1856. Roughly one year later, Sloan, who is listed on the deed as "a holder of part of the Capital Stock of the Sligo Mining and Marble Company," sold the same property back to the company. Knox County Archives, Warranty Deeds, Book W:2, 4 February 1857.

[33] The text beneath the advertisement read: "Steam Marble Works, James Sloan, Proprietor …. his extensive marble works connected with his inexhaustible Marble Quarries, at Knoxville, East Tennessee (the finest known in the United States, and perhaps equal to any in the world)." *Nashville Business Directory III,* Reverend John P. Campbell, ed. (Nashville: Smith Camp & Co., 1857), 190.

[34] Descriptions of Sloan's property in Nashville can be found in written testimony submitted to the Commissioners of Claims twice during the 1870s. Sloan's claim # 20,805, first submitted on behalf of James Sloan, White Bluff, Dixon (sic) County on 14 July 1873 (denied 22 July 1873) and again on 14 September 1875 on behalf of James Sloan, Davidson County (denied 4 December 1876). Although Sloan had one son in the Confederate army, he swore loyalty to the United States and asked for compensation for blocks of Tennessee and Italian marble, some of which he stated were taken for use in the construction of Fort Negley. United States Commission on Southern Claims, National Archives and Records Administration, now available on *Footnote*,™ Tennessee State Library and Archives. Local architect Adolphus Heiman was the architect of the1854 depot. James Patrick, "The Architecture of Adolphus Heiman," *Tennessee Historical Quarterly*, part I (Summer 1979), part II (Fall 1979) (Nashville: Tennessee Historical Society), I: 179; II: 282.

during Civil War" stated that the building was used as Federal Hospital #8 and the photograph was taken from the corner of Church Street and Seventh Avenue.[35] The address in the caption is incorrect. Historian James Hoobler has identified the brick building as the Masonic Temple.[36] Architectural historian James Patrick described the building as a four-story Italianate replacement designed by Adolphus Heiman and completed in 1860, after an 1856 fire had destroyed his Greek Revival-style renovation of the original Federal-style brick building designed by Hugh Roland, which had stood "in the north side of Spring between Cherry and Summer Streets" since 1818.[37] Hoobler has demonstrated, by the double shadow cast by the church towers, that this location was across the street from William Strickland's Egyptian Revival-style Presbyterian Church on Spring.[38] But rather than ascribing the stoneyard to James Sloan, whose business was consistently listed as being on the corner of Spring and Summer, Hoobler has identified it as Stevenson's. In the 1855 city directory for Nashville, James Stevenson is listed as a stonecutter on College Street in South Nashville. However, in the 1860-61 directory Stevenson is listed as having a stoneyard on the corner of Church (which was apparently already being

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[35] Tennessee State Library and Archives, Library Collection.

[36] James A. Hoobler, *Cities Under the Gun: Images of Occupied Nashville and Chattanooga* (Nashville: Rutledge Hill, 1986), 100.

[37] Patrick, "The Architecture of Adolphus Heiman," I: 179; II: 282.

[38] In a section entitled "Street Names" Church Street is defined as "dividing the city north and south … from the Cumberland River west to Boyd Av." *Nashville Directory XVII*, George H. Rogers, ed. (Nashville: Marshall & Bruce, 1881), 9.

used as a street name, perhaps interchangeably with Spring Street, by then) and Summer.[39] In the same 1860-61 publication, which contains no commercial listings or advertisements under either stone or marble, James T. Sloan is listed as a marble cutter, with his business address at the corner of Summer and Cherry, and a residence at 4 North Summer. It is interesting to note that in the 1855 directory Sloan and M.L. Shelton had been the only entries listed under "Stoneyards." James Stevenson appears to have been in business on College Street but there is no reference to his stone yard. One wonders if he might have been related to V.K. Stevenson, President of the Nashville & Chattanooga Railroad. The latter is listed at 61 Spring Street in 1855, and in 1860 with a business address at 49 ½ North Cherry, and a residence at 61 Church. Perhaps the cluster of stone-related business addresses can be explained by the fact that the N&C depot was at the end of Spring Street.[40] In written testimony prepared for a post-Civil War claim for federal damages to his property, Sloan and one or more of his witnesses mentioned that he had a stone yard near the train depot.[41]

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[39] The "Map of the city of Nashville and Suburbs," which accompanied the 1860-1861 Nashville City Directory and was produced expressly for that purpose, still uses the old street names: Spring (Church), College (Third), Cherry (Fourth), Summer (Fifth), etc. even though the alphabetical directory of names used Church, and Cedar was labeled Capitol or Cedar in the downtown area, becoming Charlotte Pike as it headed west.

[40] *Nashville Business Directory II* (1855), 105, 107, 111, 192.

[41] The address on the earliest claim filing suggests that he may also have had additional holdings (a limestone quarry perhaps?) in Dickson County. United States Commission on Southern Claims, # 20,805 for James Sloan.

Who was responsible for opening the first marble business in the vicinity of Knoxville has still to be determined. Some of East Tennessee's prominent early citizens certainly had seen possibilities for using the native stone. John Sevier's Marble Springs homestead, ca. 1800, most likely a log cabin, was named after deposits of marble at nearby Bays Mountain, a sample of which he carried to the U.S. Capitol in 1814 to show to one of the Italian master carvers.[42] Francis Alexander Ramsey's 1797 home, Swan Pond, now best-known as Ramsey House (figure 4), is located just east of the confluence of the Holston and French Broad rivers. It is the earliest known example of Tennessee use of the marble as a dimensional stone.[43] Is it possible that Ramsey's slaves may have worked alongside master mason Seth Smith, or at the behest of house designer Thomas Hope, on the hand-wrought quoining and hewn pink marble blocks of Ramsey's impressive federal style house?[44] It is curious that no other stone houses from this period exist in Knox

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[42] Carroll Van West, "Marble Springs," in *Tennessee Encyclopedia of History and Culture,* 570-71.

[43] In the stone industry, dimensional stone is that which is used for load-bearing exterior walls.

[44] In Charles Faulkner's historical treatment of the archaeology of Swan Pond, he mentions the possibility that Smith, a Quaker stonemason who had built other stone houses in upper East Tennessee, may have been recruited for the project. Francis Alexander Ramsey did own slaves but it is not clear from the historical record how many he owned before the first deed of sale appeared in a 1804 Knox County deed. Faulkner, *The Ramseys at Swan* Pond, 54, 66-67. Whether native American inhabitants of the North Carolina territory mined and used marble is also an open question. Two early maps of mining and minerals in East Tennessee, both indicating tribal lands in the area, mention gold, and one mentions limestone, but neither mention marble. Jacob Peck, "Geological and Mineralogical Account of the Mining Districts in the State of Georgia—western part of North Carolina and of East Tennessee, with a map" *American Journal of*

County today and, equally so, that the first commercial activity concerning a marble quarry in Knox County did not occur until more than fifty years after the erection of Francis Alexander Ramsey's home.

The author of an anonymous pamphlet, *Fifty Facts and a Few Figures Concerning Knoxville, Tennessee "The Marble City,"* asserted that marble had been quarried in Knoxville since 1842.[45] Before formal business arrangements were made possible through incorporation, quarries and mills were likely linked to individual property owners. Several references, including Safford's 1855 report, refer to a Col. John Williams, or Morgan & Williams, suggesting that he may have been one of the first to open a quarry in the Asbury (Forks of the River) section of Knox County.[46] Even before the incorporation of the first marble business in the

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Science and Arts 23 (1833): 1-10; J. Gray Smith, *A Brief Historical, Statistical, and Descriptive Review of East Tennessee, United States of America: Developing its Immense Agricultural, Mining and Manufacturing Advantages*, with: "Map of East Tennessee Forming the Eastern Portion of Tennessee, one of the United States of North America" (London: J. Leath, 1842). This map, which shows an area labeled "Gold Mine District" at the southeast corner of Tennessee, has the word "limestone" written between Cleveland and Dallas.

[45] Undated pamphlet, probably ca. 1890, Knox County Public Library, McClung Historical Collection, Vertical File.

[46] Safford described the state of the industry around Knoxville as follows: "A few miles east of Knoxville, there is a fine and valuable quarry of gray marble, belonging to Col. John Williams. The entire thickness of the bed in which it is located is three hundred and seventy five feet, ninety-five feet of which—near the base of the bed—is massive white marble, and is the portion that is worked … a large amount of marble has been taken from this quarry. Several marble factories in Knoxville have worked it extensively. There is no superior building rock in the State. Five miles east of Knoxville, at Mecklenburg, the residence of our distinguished Tennessee historian, Dr. J.G. M. Ramsey, a beautiful bluff of the light sparry marble is boldly exposed on the French

mid-1850s, however, Knoxville residents were certainly aware of the potential value of Knoxville-area marble veins. On an 1851 visit to Washington, D.C. in the company of the politically well-connected Oliver Perry Temple, Robert H. Armstrong, son of prominent Knoxville citizen Drury P. Armstrong, made a point of visiting the Washington National Monument, then under construction:

> I visited the monument alone—and spent more than half a day about it…had attained the height of 90 feet … made of huge blocks of whitish marble quarried on the Potomac—of a chrystalization [sic] larger and coarser than any I have ever seen. The work was going on well—a stationary engine drawing up men, materials and everything necessary. I was conducted to the blocks contributed by the several states formed of specimens of the native marble or rock of each. I was much interested in these blocks. There were also many contributed by Societies and corporations. All bore appropriate and patriotic mottoes and inscriptions, with devices &c &c. The largest block was one of granite from Massachusetts—but the prettiest I thought was that of the state of New York. It was black and beautifully sculptured in bas-relief. The blocks from Tennessee were beautiful, favorably comparing with any of the collection—but I know of marble in the state far more beautiful than any of the specimens in the whole number.[47]

Broad. The upper part is variegated with light flesh-colored points and patches." He appeared to be quite familiar with the Williams quarry, his description of the Ramsey place is visually compelling, and his mention of marble factories in Knoxville is equally intriguing, but the lack of a specific location east of Knoxville for the Williams quarry or any corroborating evidence pertaining to the presence of early marble manufactories is puzzling. *Goodspeed's* mentioned Knoxville pink marble being mined two miles from Knoxville by Morgan & Williams and John Williams's having a quarry northeast of Knoxville by around 1860. Charles Gordon's 1911 report linked John Williams to the Victoria Marble quarry in the Asbury district. Safford clearly made a distinction between Ramsey's Mecklenburg home, at the Forks of the River, or Asbury district, and the property of John Williams, which may even have been on the other side of the river. Gordon either confused the two locations or knew that Williams was later engaged in operations at a quarry other than his original holdings. Safford, *A Geological Reconnoissance*, 109; Gordon, *Marble Deposits of East Tennessee*.

[47] R.H. Armstrong, "Private Journal and Jottings Down In and Out of Prairiedom: Nov. 8, 1850-Sept. 15, 1851," Knox County Public Library, McClung Historical Collection, MS 917.63.

In February 1852, a week and a half after signing the contract for interior marble at the Tennessee State Capitol with commissioners John M. Bass, M. W. Brown, and Samuel D. Morgan, James Sloan was in Knoxville, apparently scouting for quarries.[48] On 28 February 1852 he wrote:

> Friend Bass, Dear Sir, According to agreement I write … to let you know my luckness (sic)/sucksess (sic) in getting marble in this county … there is a man here that has opened a quarry lately that looks very sound … I am about to lease or buy two or three quarries in this county I think it will be profitable to me … I am very thankful to you and the rest of the commissioners for your kindness to me in this matter. I look forward now for a better prospect in making something out of this marble.[49]

When Sloan went searching for a source quarry or quarries in Knoxville in 1852, there were at least two areas where marble was already being mined: at the Forks of the River (the meeting of the Holston and French Broad Rivers just east of the city, near the Ramsey House) and several miles north of Knoxville, where Sloan may first have leased and then bought a quarry.[50] The first public record of an incorporated marble business in Knox County: the Sligo Mining and Marble

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[48] The contract was executed 17 February 1852. Tennessee State Library and Archives, Capitol Construction files.

[49] Tennessee State Library and Archives, Capitol Construction files, "Marble, Plastering, Pumps Information."

[50] Warranty deed, Thomas Rodgers to James Sloan, 11 January 1856. The description of the six acres Sloan purchased from Rodgers for $600 includes a reference to a common boundary with Mrs. W.B. French and the crossing of the East Tennessee & Virginia Railroad. Knox County Archives.

Company, dates to 1854.[51] In 1856 and 1857, Sloan was involved in business transactions with Sligo, although there is no indication that he had been active in founding the company two years earlier.

How had Nashville's James Sloan assured the Tennessee State Capitol building commission he could fulfill a contract for East Tennessee marble if he did not already own or have a lease on an appropriate marble quarry in the region? Did he have an inside position that had enabled him to win the contract? Had one of the members of the commission encountered Sloan on a previous project and decided to sponsor him? Bass was a banker, and Samuel Dold Morgan one of the major antebellum industrialists in Nashville.[52] Both were also investors in the Nashville & Chattanooga Railroad—these two might well have foreseen an increase in freight revenues from Sloan's marble business.[53]

Sloan's connection might have come through architect William Strickland, whose initial 20 May 1845 proposal for the new state capitol specified the use of

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[51] A 21 January 1856 deed transaction refers to the Sligo Mining and Marble Company as "a corporation created by an act of the General Assembly of Tennessee entitled An Act to Incorporate the Memphis Building and Loan Association Company and the Nashville Building Association passed February the 1st 1854." Knox County Archives.

[52] Constantine G. Belissary, "The Rise of the Industrial Spirit in Tennessee, 1865-1885" (Ph.D. diss., Vanderbilt University, 1949), 18.

[53] In an important re-assessment of southern railroad building, historian R. S. Cotterill has posited that the South planned its railroad network systematically and with the clear purpose of securing western freight routes. He also claimed that while most routes were home-financed, the Nashville & Chattanooga Railroad was one of the very few in the South supported by outside money, although many enjoyed "banking privileges." Both circumstances may help explain why the N&C was the first line completed in Tennessee in 1854. Cotterill, 427-431, 434, 436.

"the best cut and chiseled [sic]Limestone, from the neighborhood of Nashville and Marble from East Tennessee." Strickland's official letter to the commissioners went into some detail, stating: "The columns of the Hall of Representatives and Senate Chamber to be variegated marble, as well as the decorative parts of the interior of the building."[54] Strickland, who hoped to recruit experienced stonemasons for his project, might have somehow known Sloan, or at the very least, would have welcomed an experienced marble mason to Nashville. Strickland, who had already designed a handsome new Presbyterian church in downtown Nashville, had other commissions that promised to keep him in the city for some years to come. In betting on an ambitious young stonemason, either the members of the Building Commission or the Architect of the Capitol himself may have hoped to create local competency for future projects or at the very least establish a profitable Middle Tennessee outlet for East Tennessee marble.

Knox County deeds from 1855 and 1856 reveal that Philadelphian Montroville W. Dickeson, a medical doctor born circa 1810, had purchased a parcel of land on which there was a marble quarry.[55] He had also leased another with the

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[54] Also of major concern were the building's fireproof qualities: all window frames and sashes were to be of cast iron, the roof covered with sheet copper, and the flooring also of stone. Robert H. White, *Messages of the Governors of Tennessee,* 1845-1857, v. 4 (Nashville: Tennessee Historical Commission, 1957), 64-65.

[55] The United States manuscript census taken in June 1880 recorded Dickeson, age 70, living with his much-younger sisters Anna and Rebecca on Lombard Street in Philadelphia.

promise of purchase if marble was found.[56] Dickeson published a pamphlet, after having been in residence on the properties for four months, stating that he had observed an "extensive deposit of variegated and compact marble, belonging to the company … situated, both in a North-east and South-westerly direction from the city of Knoxville. The first-named property … formerly owned by Col. James Welker, lies two and a half miles N.E. from the city."[57] Dickeson was well aware that the term marble was being used for almost any polishable mineral, so he took pains to make clear that the marble he was describing was durable and desirable architectural and sculptural stone.[58] He also reported that one of the properties was served by the East Tennessee & Virginia Railroad, and a second on the south side of the river, one and a half miles from Knoxville, was on the proposed route of the Knoxville & Charleston.[59]

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[56] Warranty deeds, James M. Welcker to Montroville W. Dickinson [sic] 1 February 1856; John Wrinkle to Montroville W. Dickinson [sic] 9 May 1855 and 9 February 1856. While no corporate name appears on these deeds, they do include a reference to M.W. Dickeson, M.D., John W. Tilford, and George R. Hazwell, incorporators of the Dickeson Marble and Zinc Mining Manufacturing Company before the Tennessee General Assembly in Nashville, 21 February 1856. Knox County Archives.

[57] Montroville W. Dickeson, *Report of a Geological Survey and Examination Upon the Lands Owned by the Dickeson Marble and Zinc Mining and Manufacturing Company of Tennessee* (Philadelphia: J. Hufty, 1856), 1.

[58] Ibid., 2.

[59] Ibid., 5. According to Blount County historian Inez Burns, Blount County purchased 120,000 shares in the Knoxville and Charleston Railroad in 1854. Its directors, including Knoxvillians William G. Swann and John J. Craig, met in Maryville on 18 July 1856. Inez E. Burns, *History of Blount County, TN, 1795-1955* (Nashville: Tennessee Historical Commission, 1957, rev. 1988), 235.

The correspondence and contracts related to commissions in Washington and Nashville for marble businessmen Rice and Sloan show that both men had influential personal contacts and eagerly sought business opportunities in Tennessee and outside the state. The 1840s and 1850s had seen a number of federal building projects underway in Washington, with new commercial and public buildings also being built up and down the east coast and in inland port cities such as Louisville and New Orleans. In addition to those for the United States Capitol Extensions, Dougherty secured contracts to furnish Tennessee marble for interior use in the state capitols of South Carolina and Ohio, as well as the Baltimore City Hall. All four of these men were not only focused on the expanding market for marble building stone but also eager for a network of railroads that would make it possible to transport the heavy and valuable freight long distances.

There is little doubt that geography was a major determinant in the political economy of East Tennessee's marble industry during the early decades of the nineteenth century. With little capital investment and perhaps a shortage of skilled labor, quarry owners may have undertaken only rudimentary processing before loading marble for building purposes onto wagons for overland transport or flatboats for shipping long distances. Once railroad connections were established, East Tennessee marble quarries hoped to furnish rough cut blocks to the trade by sending them directly to marble yards in Philadelphia and Baltimore, perhaps even to New Orleans and St. Louis. This was typical of many Southern industries of the

time and notices of new stocks of Tennessee marble, which appeared in agrarian publications in Pennsylvania and upstate New York, suggest that the industry not only depended upon middlemen to arrange export outside the region but also upon distant manufacturers to finish the stone.

Tennessee geologist James Safford's first biennial report (delivered in December 1855) had noted that some or all of the interior marble needed for the U.S. Capitol extensions was being obtained from a quarry nine miles south of Rogersville.[60] Moving such an extensive load of marble at that time would have involved sending it by flatboat down the Holston River or by rail to Knoxville, then shipping it down the Tennessee River to rail access at Loudon or Chattanooga, loading it on train cars for Augusta, Savannah, or Charleston, then forwarding it by schooner to the port of Baltimore, and then by train from Baltimore to Washington.[61] And even though the Rogersville Marble Company was capable of

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[60] Safford, *A Geological Reconoissance,* 108.

[61]A letter dated 31 March 1858, from William Dougherty to Captain Montgomery Meigs, concerning the delay in sending columns of Tennessee marble for the Capitol, hints at the difficult and laborious route for marble from East Tennessee to east coast markets. "I had them taken 200 miles further down the river than the usual landing, and sent the greater part of the force at the quarry to unload them on the beach and haul them to the Rail Road which cost me over four hundred dollars more than it would otherwise have done. 13 of the columns are in this lot, the other one is on its way to Charleston, and if you think it will not be wanted please inform me and I will stop it when it arrives there." The river referred may have been the Holston, which passes just south of Rogersville and ultimately joins the French Broad to form the Tennessee at Knoxville. The "beach" where the river met the railroad may have been at Knoxville or Loudon, although the mention of two hundred mile distance suggests that Dougherty may have floated the marble downstream as far as Chattanooga. The East Tennessee & Virginia Railroad was fully completed from Knoxville to Bristol on 14 May 1858,

providing fine and decorative finishes, as was evidenced by their memorial stones for the Washington National Monument, the marble for the United States Capitol was shipped in block form to be cut by marble masons on site. Yet, writing to Captain Montgomery Meigs in March 1858, Dougherty spoke of the marble columns he was sending as if they were identifiable as such.[62] While Dougherty might have deemed it too risky to send the marble for the Capitol in finished form, it is likely that he had it as least roughly dressed in order to prevent having to ship excess weight.

Photographs from the period show what appears to be an outdoor marble workshop on the Capitol grounds, with rough blocks of marble standing on the ground and at least one mechanized lathe for turning stone columns. In an 1857 letter to stone contractor Alexander Provest, Capitol architect Thomas Walter referred to "Morgan's Machine," mentioning that two of these machines were at work on the north and south of the Capitol grounds.[63]

The experienced Dougherty, who was used to supervising stoneworkers, would soon be responsible for furnishing enormous monolithic columns for the South Carolina State House, as well as decorative marble for the interiors of the Ohio State Capitol. If he could have afforded it, it is likely that he would have put into

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according to John McGaughey, "A Succinct History of the Road East Tennessee & Virginia," *Knoxville Register,* 21 May 1858.

[62] Dougherty to Meigs, 31 March 1858, Architect of the Capitol, Marble Contracts.

[63] Walter to Provest, Architect of the Capitol, Thomas U. Walter letterbook.

place the men and machinery to make his operation capable of providing finished stone shipped from the Tennessee quarries.[64] Dougherty left Washington in the fall of 1859 for Columbia, South Carolina.[65] Baltimore architect, John R. Niernsee, familiar with the United States Capitol Extensions and the Washington National Monument, had early sought advice from both Dougherty and Philadelphia architect Thomas U. Walter about workmen and materials for the South Carolina State Capitol.[66] In 1858, the contract to furnish cut and finished stonework for the building ($335,000) was awarded to Baltimore marble mason and stone contractor Hugh Sisson, whom Niernsee likely knew from his former tenure in that city.[67]

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[64] While he was engaged at the Washington National Monument, Dougherty had been asked to compare costs of dressing and laying marble by his own crew of stonecutters against the cost of using machinery to dress the stone. His report to the Washington National Monument Society's Thomas Carbery, which detailed expenditures for 15,210 feet of marble at the Washington National Monument for the year 1852, showed that using a machine would have saved 5.89 cents per foot. William Dougherty to Thomas Carbery, n.d., National Archives and Records Administration, RG 42,Washington National Monument Society papers.

[65] Letters from Thomas Walter to John R. Niernsee in the Fall of 1858 and Spring of 1859 show that Dougherty was already working there to furnish marble and oversee the stonework. Architect of the Capitol, Thomas U. Walter letterbook.

[66] On 16 September 1858, Walter gave written recommendations for two Italian stone carvers who excelled at decorative work. On 7 December 1858, Walter weighed in on the issue of whether or not to flute the shafts of Corinthian columns. On 17 February 1859, Walter mentioned William Dougherty, who had asked him to suggest a carver for delicate sculptural medallions. Architect of the Capitol, Thomas U. Walter letterbook.

[67] Hugh Sisson, born in Baltimore circa 1821, was a wealthy man by age forty. The 1860 manuscript census listed him as a master stonecutter owning $35,000 in real estate and with a personal estate valued at $30,000. Married to Pennsylvanian Sarah Lippincott in 1848, he had fathered six children by 1860. The Slave Census of 1860

In preparation for the project, Niernsee had anticipated possible problems by having a dam built to prevent flooding of the quarry and ordering a rail spur that could serve the quarry-to-building site route.[68] He also enhanced the original infrastructure by employing a steam engine to pump unwanted water out of the quarry, thus freeing some slave laborers from menial tasks to perform more important duties. Even though their labor was coerced, the slaves working on the South Carolina state house must have felt that they were engaged in an important undertaking. While most of the initial workforce was engaged in the quarries, some brought skills such as carpentry and blacksmithing into the workplace, while others used their experience with mule and horse teams for hauling and rigging heavy loads.[69] Unlike the penitentiary force in Nashville, these workers, hired from local owners, were able to move relatively freely on the job. However, they were just as likely to be segregated from the decorative carvers, bricklayers, and skilled stonemasons, many of them itinerants, at the building construction site.[70] Niernsee, who had relocated to Columbia so that he could oversee every aspect of the project,

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reveals that Sisson also owned twenty-one male and fifteen female slaves. The IRS Tax Assessment List for 1862 show that he owned marble works at 207 North Street in Baltimore, with a value of $1699.05. In 1890, the city directory (Baltimore: R.L. Polk & Co.) listed "Hugh Sisson & Sons Steam Marble Works, North at Monument."

[68] Before leaving Baltimore, he had worked under Benjamin Henry Latrobe, Jr. on the Baltimore and Ohio Railroad. John M. Bryan, *Creating the South Carolina State House* (Columbia: University of South Carolina Press, 1999), 38.

[69] Bryan, 35.

[70] Bryan, 46-47.

had a hand in the selection of the workers needed for sculptural detail carving. Dougherty and Sisson assumed the hiring and supervision of the bulk of stone workers: a separate work force of stonecutters and setters that grew to as many as 121 in 1860.[71]

Sisson and Dougherty may also have been partners in furnishing marble for the United States Capitol Extensions, as the Hawkins County quarry where that marble was sourced has historically been called either the National Quarry or Dougherty & Sisson's.[72] From this Tennessee quarry or quarries also came the marble for single-shaft Doric columns still in place today in the first floor rotunda of the Baltimore City Hall. These, too, are likely to have been finished on site in Baltimore, where there appears to have been strong worker solidarity and a great deal of local pride tied to the erection of the handsome public building.[73] While this still-prominent Baltimore landmark was not actually completed until 1875, eight years after Dougherty's death, the material for the columns may have been acquired either prior to Dougherty's passing or under the auspices of his son Edward, who

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[71] Bryan, 46-47.

[72] James M. Safford, *Geology of Tennessee* (Nashville: S.C. Mercer, 1869), 507.

[73] Architect George A. Frederick submitted the winning design for the Baltimore City Hall in 1865, Martin A. Sisson, of Baltimore was awarded the contract for exterior marble and Hugh Sisson was awarded the contract for interior marble. Work appears to have been well underway at the quarries by the time of the cornerstone-laying in October 1868. The ceremony was accompanied by a procession that included three wagonloads of marble cutters from Hugh Sisson's shop and one hundred stonecutters from the establishment of M.A. Sisson. Maryland Historical Society, *The City Hall Baltimore: History of its Construction and Dedication* (Baltimore: Kelly, Piet and Company, 1877) 37, 84-85, 135, 140-41.

continued and apparently expanded his father's Hawkins County marble interests. Deed research in Hawkins County has yet to yield documents indicating whether the quarry was owned or leased, although correspondence between William Dougherty and local landowner Andrew Galbraith suggests the latter.[74]

Industry in Antebellum Tennessee

In the early decades of the nineteenth century Tennessee was still the frontier, with little infrastructure for small industry. Prior to the Civil War, the state was actively participating in the national market economy, at least in a few sectors. Southern upcountry farmers were shipping goods to markets both inside and outside the South.[75] The production of Tennessee counties from 1850 to 1880 equaled more food by half than required by the population: Tennessee wheat was sold in New York, livestock was driven south for sale, and, after 1854, Nashville became something of an agricultural processing center, with meat and flour being shipped east and south via new railroad connections to Chattanooga, which linked it

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[74] A previously-cited letter from William Dougherty to Andrew Galbraith (1854) implied that Galbraith was the owner of the Tennessee quarry where Dougherty was getting out stone. A 13 February 1872 property deed indicated that Dougherty's wife Mary and son Edward owned at least one quarry in Hawkins County. H.B. Stamps Memorial Library, Rogersville, Vertical file, "James Lee et al to E.D. & Mary A. Dougherty, Potato Hill Marble Quarry (adjacent to lands of Andrew Galbraith, Joseph Galbraith, Henderson Fu…) for $200."

[75] Dunaway, 20; Salstrom, xviii.

to Augusta, Savannah and Charleston.[76] As if filling a vacuum, many of those moving into the region were skilled workers who came from 'capitalist zones,' such as England, Ireland, Scotland, and Germany, and thus well prepared to develop the resources they found.[77] The early coal industry in Tennessee saw individuals such as Irish miner Leslie Kennedy, railroad contractors McGehee and Company, a capable German manager named John Jochmus, and a group of Irish coalminers somehow materialize from the hinterlands. Slave owners involved in resources extraction, especially in the iron industry, and itinerant workers, who arrived to construct architectural projects, houses for elite Tennesseans, and railroads and bridges, trained several generations of African American mechanics and builders.[78]

Iron forges and furnaces, a necessary fixture of the frontier, had been Tennessee's first major industry. Montgomery Bell, who purchased Cumberland Furnace from Nashville founder James Robertson in 1804, developed the works outside Dickson, Tennessee, using waterpower from nearby rivers, into an important industrial site using both free and slave labor.[79] The Middle Tennessee

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[76] Robert Tracy McKenzie, *One South or Many? Plantation Belt and Upcountry in Civil War-era Tennessee* (Cambridge: Cambridge University Press, 1994), 38.

[77] Dunaway, 16.

[78] Fuller, 8, 10, 13, 18; Richard Blackett, "Best Laid Plans," *Vanderbilt Magazine* (Spring 2008): 86.

[79] Michael T. Gavin, *Tennessee Iron Furnace Trail: A Guide to Resources on the Western Highland Rim* (Murfreesboro: Middle Tennessee State University Center for Historic Preservation, Tennessee Civil War National Heritage Area, and USDA Forest Service, 2006), 19.

iron industry, along the Western Highland Rim, between the Cumberland and Tennessee Rivers and their tributaries, which was one of the leading producers in the South, followed the plantation model of slave labor in which workers performed dangerous and backbreaking work under duress.[80] By the time of the Civil War, many of Middle Tennessee's iron works, which drew on the state's healthy abundance of mineral resources but also depended primarily upon waterways for mill power and transportation, had begun to wane, partly due to the lag in construction of railroads into the northwest section of Middle Tennessee. While the Nashville & Chattanooga Railroad was being built to the southeast with the express purpose of connecting Cumberland mountain coal and iron to markets north and south, the western Middle Tennessee iron works fell behind. Most closed down during and after the Civil War as workers vanished. Montgomery Bell, who died in 1855, had already sold most of his interests and arranged for a group of emancipated skilled workers to found an iron industry in Liberia.[81]

The Tennessee Coal, Iron and Railroad Company, begun as a coal mining business on the lower Cumberland Plateau in 1852, could be considered Tennessee's first example of *modern* industry. It had a division of labor, inter-dependent component parts, and its own railroad line. Investors had begun to acquire area land in this area of abundant coal seams under the auspices of the Sewanee Mining Company in 1835, but it was not until twenty years later, on the eve

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[80] Ibid., 2.

[81] Blackett, 86-88.

of completion of the Nashville & Chattanooga Railroad, that it was fully capitalized. Purchased by Nashville attorney and newspaperman Arthur Colyar in 1858, the company suffered from the dearth of skilled labor, scarcity of additional capital, and an inadequate local market for coal.[82] It was reorganized with the addition of northern investors as the Tennessee Coal and Rail Company in 1859.[83] By the time it was taken over by J.P. Morgan's U. S. Steel Corporation, in 1907, it was the largest industrial company in the South.[84]

There are some indications that Orville Rice's Rogersville Marble Company established itself along similarly modern lines.[85] The United States Census of Manufactures for the year 1850 contained one reference to marble in Tennessee: O. Rice, Hawkins County, "marble factory." Not only was Rice engaged in quarrying stone, he was also employing six men to produce monuments and tombstones using water-powered machinery.[86] Flour and gristmills, tanneries, and a saddlery were among the other ten businesses producing "products of industry" in Hawkins County in 1850. All employed fewer persons than Rice's marble business and most produced a lower annual value of goods than his output of $4,000. The one large

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[82] Justin Fuller, "History of the Tennessee Coal, Iron, & Railroad Company, 1852-1907" (PhD diss., University of North Carolina, 1966), iii, 1-3.

[83] Gilbert E. Govan and James W. Livingood, *The Chattanooga Country, 1540-1967: From Tomahawks to TVA,* 3rd ed. (Knoxville: University of Tennessee, 1977), 352-53.

[84] Fuller, 1.

[85] Safford, *Geological Reconnoissance*), 107.

[86] U.S. Bureau of the Census, Washington, D.C. *Seventh Census: Manufactures* (1850), 127.

business in the county was a water-powered cotton spinning operation that employed seventeen males and thirty-three females, producing an output valued at $28,000.

Nonetheless, as the rise of the Tennessee Coal, Iron and Railroad Company demonstrates, some forward-thinking Tennesseans were investing capital in resources other than plantation agriculture during this period. Troost's published geological reports encouraging exploitation of the Cumberland region's natural resources were followed with interest by speculators in mining and minerals.[87] Nashville leaders John Overton and A.O. Nicholson, both prominently associated with the campaign for the Nashville & Chattanooga, used Troost's 1845 report to the General Assembly to justify the expediency of a tunnel through the coal-rich mountains.[88] An 1854 promotional article from the *Knoxville Register* also exhorted readers to invest in East Tennessee coal and iron, claiming that rails will soon be "radiating" from Knoxville in all directions, and adding that profits await those willing to develop existing marble, zinc, and lead operations.[89]

But modern transportation would be slow in coming, due not only to lack of funds but in large measure to sectional politics, which caused delays in river navigation improvements and the construction of railroad lines. With little federal

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[87] Dunaway, 349n57; Fuller, 4.

[88] S. J. Folmsbee, "The Origins of the Nashville and Chattanooga Railroad," *The East Tennessee Historical Society Publications* VI (1934), 86.

[89] Dunaway, 253.

or state underwriting and few large corporate interests at stake, Tennessee (and the South generally) was forced to raise private money for railroad construction. Historian R.S. Cotterill has pointed out that the profit motive for some southern states, including Tennessee, was based on attracting western freight before it reached New Orleans and diverting it to southeastern ports. And that while southern leaders should be recognized for cooperatively planning a utilitarian and purposeful network of railroads, they erred in assuming that rivers would remain the principal avenues of transportation and that the purpose of the railroads was primarily to provide land connections between them.[90]

Under Andrew Johnson's governorship in the 1850s, the state's investments in infrastructure (and state indebtedness) doubled.[91] Even though Johnson positioned himself as a Jacksonian Democrat and a fiscal conservative who decried state ownership of banks and railroads, he championed the rapid completion of railroad links, waterway clearance, roads and turnpikes—even the over-budget Tennessee Capitol—as examples of the state's progress. He also stood up for the skilled mechanics, identifying with them as fellow working men:

> Although I am myself opposed to classes amongst my countrymen—I want all elevated according to one grand scale of virtue and intelligence … I say,

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[90] Cotterill, 427-28, 438. For example, early boosters of the Nashville & Chattanooga Railroad touted it as a link between navigable sections of the Tennessee and Cumberland Rivers. Jesse C. Burt, Jr. "History of the Nashville, Chattanooga and St. Louis, 1873-1916" (Ph.D. diss. Vanderbilt University, 1950), iii.

[91] Leroy P. Graf and Ralph W. Haskins, eds. *The Papers of Andrew Johnson,* v. 2:1852-1857 (Knoxville: University of Tennessee Press, 1970), 329, 483.

> then, if we have an aristocracy, let it be an aristocracy of labor, intelligence, and virtue … resting upon actual personal merit … let our agriculture and mechanism go on improving, and our agriculturists and mechanics will be recognized among the first classes in the country; and so our confidence shall be increased in the wisdom and permanency of all our free institutions.[92]

On the eve of the Civil War, Tennessee was rapidly working to connect its markets to the national transportation grid. In addition to making railroad connections south and east in partnership with the states of Alabama, Georgia, and South Carolina, Tennesseans were also looking north to the Ohio River. Construction on the Louisville & Nashville Railroad was proceeding toward completion by 1859, and the Knoxville & Kentucky railroad, designed to connect upper East Tennessee coalfields to the Ohio River, had started laying rails from Knoxville in 1855. Part of Tennessee's initial reluctance to enter the Confederacy—at least one compelling explanation for East Tennessee's staunch resistance to secession—would have been the state's historic and ongoing ties to the national economy. The state's fiscal health was of utmost concern to leaders. Banking policy and appropriations for infrastructure were matters of contentious debate between Tennessee Whigs and Democrats during a period where the governorship changed hands almost every two years and politicians like James K. Polk and, after the Civil War, Andrew Johnson, were moving freely between national and state office. While many Tennesseans were distrustful of the banking business, several of Tennessee's most

[92] Ibid., 510.

prominent banks were largely capitalized in eastern cities.[93] Historian Donald Winters has claimed that banking was the weakest link in Tennessee's antebellum agricultural economy. While most farmers grew at least fifty per cent staple crops for market and took on profitable sidelines, such as becoming tavern and innkeepers, ferry masters, blacksmiths, distillers, bank shortages meant that both farmers and other businesses had to take barter for goods or crops or to resort to informal arrangements with individuals who held specie or bank notes.[94]

For several decades Tennesseans had been advocating for and developing a web of railroads that would ultimately connect the state not only east-to-west, to coastal southern markets and inland river southern markets, but also north to Louisville, Cincinnati, St. Louis, and Chicago. Centrally located Nashville was a western transportation hub, with steamboats plying goods and passengers from New Orleans to Louisville via the Cumberland River and turnpikes leading in and out of the city from all directions. Memphis was quickly becoming one of the leading commercial capitals of the Delta South, as well as a gateway for cotton and tobacco to foreign markets through New Orleans. But East Tennessee, long a nexus for

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[93] In an 1859-60 report to the General Assembly, the Bank of Tennessee is listed as a paying client of both Planter's and Union Banks, both private banks having their largest numbers of shareholders in Philadelphia. Planter's Bank, which had more shareholders in New York than in Tennessee, counted Cowan and Dickinson of Knoxville among its depositors, while Union Bank served, among others, John Bass (President, Union Bank of Tennessee, and Chair, Capitol Building Commission), Adolphus Heiman, and Samuel Watkins in Nashville, and R.H. Armstrong, and the firm of Cowan and Dickinson in Knoxville. *Reports from Public Officers & Institutions made to the General Assembly of Tennessee session of 1859-60* (Nashville: E.G. Eastman & Co., 1860)

[94] Winters, 87, 94-95.

mercantile operations in the backcountry and lower Tennessee valley, was frustrated by the inefficiency of its waterways. Its burgeoning coal and iron industries demanded connections to East Coast centers of power, which could best be achieved through a system of railroad lines running south into Georgia and Alabama and north through Virginia into the major metropolitan areas of the mid-Atlantic. It seems highly likely that the "creation" of an East Tennessee marble industry may have been, in part, another means of encouraging public investment in railroads.

The Development of Water and Rail Transportation in Tennessee

Prior to the coming of steamboats, which could progress upstream under power, most Tennesseans depended upon overland wagon transport for manufactured necessities and on flatboats to export their products via waterways. East Tennesseans, dependent for both imports and exports on wagons bringing goods to and from markets in Philadelphia, Baltimore, and Richmond, could only get heavy exports like iron and salt (and marble) out on flatboats at the times of year when rivers were high. Steamboats began coming up the Cumberland to Nashville around 1818-19, but not until circa 1826-1830 did the first one make its way up the Tennessee to Knoxville. One problem was the Alabama shoals, which had to be negotiated with keel or flatboats.[95] Without that natural barrier, the East Tennessee

[95] Ibid., 80, 82-3.

marble industry would have gained much early advantage from convenient access to river trade.

The disputes over internal improvements in Tennessee pitted East and West against the more prosperous and well-situated Middle. Historian Sam Davis Elliott has suggested that resentment over East Tennessee's continuing economic isolation was heightened by the fact that the region had once been the seat of political power.[96] By 1830 the population of Middle Tennessee was twice that of East Tennessee and nearly three times that of West Tennessee. The lack of federal aid for such internal improvements as a section of the "national road," or a canal that would allow boats to skirt the un-navigable shoals of the Tennessee River, had annoyed Tennesseans who felt that their needs were being ignored by the administration of President John Quincy Adams.

But things did not improve for East Tennessee even with a Tennessean as President. Andrew Jackson was an opponent of federal funding for such projects—charging that they encouraged corruption and political favoritism, recommending instead that money from the sale of public lands be used to retire the public debt. Most Tennessee politicians, except for some holdouts in East Tennessee and David Crockett in West Tennessee, reluctantly sided with him. Jackson did allow, however,

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[96] Sam Davis Elliott, *Isham G. Harris of Tennessee: Confederate Governor and United States Senator* (Baton Rouge: LSU Press, 2010), 77.

that once the debts were retired, any monies left from the sale of public lands be given to the states for their own internal improvement projects.[97]

Fortunately for Tennessee, with its vast network of rivers, Jackson's objections to internal improvements did not preclude federal funding for improving the navigation of waterways. When Nashville was designated the port of entry for Tennessee, Jackson approved $135,000 for removing obstructions from the Cumberland River from 1832-1837.[98] When Middle Tennessee state senators and representatives voted against using a portion of the 1841 federal funds distribution from the sale of public lands for river improvements in the rest of the state, a West Tennessee representative cried foul, declaring vehemently that Davidson County had already derived more benefit from state funding than the rest of the state combined.[99] Unfortunately for the state's eastern section, neither the city of Knoxville nor the tiny borough of Chattanooga was recognized as a port of entry, so no monies were granted for improvements to navigation around the shoals of the Tennessee River until 1852. The delay crippled the region, which began to clamor for the completion of railroad lines that would link it to Charleston and Savannah soon after the State of Georgia had begun building the Western & Atlantic Railroad in 1841.

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[97] Stanley J. Folmsbee, *Sectionalism and Internal Improvements in Tennessee, 1796-1845* (Knoxville: East Tennessee Historical Society, 1939), 63.

[98] Ibid., 67-68.

[99] Ibid., 219; Anonymous, "R. Road Communication Between Charleston, Savannah and Nashville," *Southern Quarterly Review* (1845): 298.

For inland Tennessee, the prospect of railroads coming into the state excited both the citizens of isolated upper East Tennessee and those in the far southwest corner of the state. Soon there were multiple proposals to link Memphis to the distant markets of the Atlantic coast. These included one route through Tennessee and Georgia to Augusta, Savannah, and Charleston; one through Mississippi and Alabama to those same cities; and one diagonally across Tennessee, passing through Columbia and Bristol, on its way through Virginia to the Atlantic seaboard. The disputes that arose over approval of routes and the mechanisms for funding railroad lines were complicated by proposals for north-south routes to Nashville from Cincinnati and New Orleans.

For decades, Tennessee and South Carolina had had close business ties, beginning with the inland fur trade on the frontier and continuing as backcountry neighbors across the mountains. More recently those ties had been based on railroad cooperation. On the eve of the Civil War, South Carolina's new State House was well underway. The Greek Revival-style structure emulated the newly completed Tennessee State Capitol in several respects. It was sited prominently on a high hill, was to be a fireproof building of local stone quarried nearby, had monumental Corinthian-order porches and a proposed tower based on Strickland's adaptation of the Greek monument to Lysicrates, and its decorative interior furnishings were to include monolithic columns of East Tennessee's variegated marble.[100] The local stone used for the building's exterior, was, in this case, granite.

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[100] Bryan, 38-39.

The workforce, primarily African American slaves, quarried the Granby granite, loaded flat cars, and guided mule teams along the three-miles of railroad track built especially to move the stone from quarry to building site. When architect John Niernsee chose Hawkins County marble for the interior of the building, he must have been confident in the ability of contractors Dougherty and Sisson to transport it by river and rail to the building site.

In 1839, Tennessee was the only state in the South with no railroad lines.[101] While other states were using railways to haul commodities to market or to the nearest port, Tennessee's outgoing freight was still dependent on river transport. The improvement of navigation on Tennessee waterways—the subject of political squabbles in the 1830s and again from 1841 to 1852—had caused a nearly two-decades-long lag in market competitiveness for East Tennessee.[102]

Between 1831 and 1832, an advocacy group in Hawkins County that published a newspaper called *The Railroad Advocate* had been inclined to promote a railroad partnership northward into southwest Virginia, a union that would cross state lines. The Tennessee legislature approved the route but failed to issue bonds to fund it. When Virginia's legislature failed to fund their portion, the idea was abandoned. Had upper East Tennessee been able to profit from this early railroad

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[101] Albert Fishlow, *American Railroads and the Transformation of the Ante-Bellum Economy* (Cambridge: Harvard University Press, 1965), 322.

[102] Folmsbee, *Sectionalism and Internal Improvements in Tennessee, 1796-1845,* 67-68.

link through Virginia to the markets of the middle Atlantic, perhaps the marble industry of upper East Tennessee would have expanded beyond its initial scope in and around Rogersville. Safford's 1855 geological map (figure 6) showed limestone stratifications running from upper east towards the south and west. It is highly likely that some of the counties surrounding Hawkins, or between Hawkins and Knox Counties, such as Grainger, Hancock, Jefferson, Anderson, Claiborne and Campbell, might possess veins of marble that have never been fully opened.

By the mid 1830s, there was widespread recognition of the need not only for intra-state but also for inter-state cooperation in developing rail lines, particularly those utilizing natural geographical corridors such as the Tennessee River valley. In an attempt to facilitate transportation for incoming goods and outgoing resources, East Tennessee leaders had chartered the Knoxville & Southern Railroad in 1831. It was designed to operate from the Tennessee River just below Knoxville to the state's southern boundary, where the rails could connect to lines leading through Georgia to the important port cities of Charleston and Savannah.[103] In 1834, Tennessee passed a new and progressive Constitution that provided a mechanism for funding public improvements through state-backed bonds. Engineer J.B. Petitval reported having surveyed proposed routes for railroads through West Tennessee for interested groups of stockholders in Jackson and Columbia during the winter months of that same year. He reported on 31 May 1834 that both groups were already well-subscribed and that lines would soon be undertaken to the Tennessee

[103] Burns, *History of Blount County, TN, 1795-1955*, 235.

River, with a connecting line between the two points of river intersection. Further, he mentioned that East Tennessee would soon begin work on railroads that would form part of an "uninterrupted communication" between New York and New Orleans and that would allow the opening of markets in the northeast and the southwest for "the inexhaustible quarries of marble, beds of coal, veins of ore of every metal, found amongst her beautiful and picturesque mountains."[104]

Tennessee's constitutional formula allowed the State to issue bonds covering one third of the cost of an improvement after its capital stock was two thirds subscribed. In 1836, the State appropriated $15,000 to survey a central route for a proposed railroad across the state diagonally from Memphis to Knoxville. Albert Miller Lea, a West Point graduate who created an important early map of the city of Knoxville, was the surveyor and chief engineer engaged on the survey.[105] But where were the promoters of mining and minerals enterprises in upper East Tennessee when this railroad was being planned? Reports from out of state advocates for railroad connections through Tennessee during the 1830s and 1840s mentioned the marble of the East Tennessee mountain region specifically.[106]

Business leaders gathered in Knoxville for the Great Southeastern Railroad convention in 1836, at which the concept of linking Louisville, Cincinnati, and

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[104] J.B. Petitval, "Railroads in Tennessee," *Mechanics' Magazine, and Journal of the Mechanics' Institute* (31 May 1834): 316.

[105] Rule, *Standard History of* Knoxville, 278.

[106] Petitval, 316; "R. Road Communication Between Charleston, Savannah and Nashville, *Southern Quarterly Review* (October 1845): 298.

Charleston by rail was proposed. It was abandoned the following year in the financial panic of 1837.[107] Although a Memphis Rail Road Company was formed in December 1831, the first attempt to connect Memphis to the burgeoning railroad network was the charter issued to the Memphis & Charleston Railroad on 2 February 1846.[108]

A third venture begun about this same time was destined for much faster completion. The Hiwassee Railroad, covering the route from Knoxville south to the Tennessee-Georgia border, was chartered in 1836, with ground broken the following year. In 1837, the state of Georgia approved a line east through Georgia to meet the Hiwassee line. In 1841, work began on that road, the Western & Atlantic, soon to be the conduit for rail service from Tennessee to the Atlantic coast.

After encountering financial difficulties, the Hiwassee Railroad, which never received any state assistance, was reorganized as the East Tennessee & Georgia in 1848; its route, passing through Athens, Tennessee, was completed northward as far as the crossing of the Tennessee River at Loudon (then known as Blair's Ferry) by 1852. In upper East Tennessee, the passage of a general "internal improvements" funding bill in 1852 encouraged investment in the East Tennessee & Virginia line that had been chartered in 1848 and likely also propelled the completion of the

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[107] Edward A. Johnson, "Railroads," in *Tennessee Encyclopedia of History and Culture,* www.tennesseeencyclopedia.net [accessed 18 December 2010]

[108] White, *Messages of the Governors*, IV.

ET&G, since the bond funding formula depended upon the percentage of track in place.[109]

By late 1851, young Knoxvillian Robert H. Armstrong was able to extol the virtues of the first full segment of the East Tennessee & Georgia line. After a circuitous return trip from Washington, D.C. by steamer to Charleston, then by railroad through Hamburg, South Carolina, and up through Atlanta, Rome, and Chattanooga to Dalton, he wrote:

> On board East Ten. and Geo. Road—everything new and splendid—I was proud to observe this, my home road, both in the grading, bridging, superstructure, railing, cars, locomotive and all could favorably compare with the best road I had seen anywhere. In speed and in the general "feeling of the motion" it reminded me of the great Erie road of New York. I felt a real and indescribable pleasure in the reflection that "ours" would be one of the very best roads in the Union. We went over 40 miles an hour and were at Charleston, Ten. The road is in rapid progress of completion to Knoxville. By October "twill" be at Athens, by March 1852 at Blair's Ferry—on Tennessee River.[110]

The distance from Loudon to Knoxville was fully tracked by 1854, and after completion of a railroad bridge over the Tennessee River at Loudon, the line from Dalton to Knoxville opened to great fanfare in June 1855.[111] Because it did not yet extend as far west as Chattanooga, passengers and freight had to leave the ET& G and travel west along the Western & Atlantic line before making connections to

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[109] Rule, 278.

[110] Armstrong, "Private Journal," 168-169.

[111] Burns, 235.

Nashville and Memphis. From Knoxville, however, the ET&G connected directly through Dalton to the Western & Atlantic and points southeast.

The Nashville & Chattanooga Railroad, chartered in 1845, was the first Tennessee road completed. With the potential for mining on their minds, railroad organizers, some of whom would later be involved in extraction of mineral resources in the vicinity of the Cumberland Plateau, had asked Tennessee State Geologist Gerard Troost to suggest a logical route, which he detailed in a report to the General Assembly in 1845.[112] By 1851, the road, whose passage relied on building a tunnel through the limestone escarpment of the Cumberland Plateau at Cowan, Tennessee, had reached the Tennessee River at Bridgeport, Alabama and was at least partly operational by 1853. Under the leadership of Vernon K. Stevenson, the Nashville & Chattanooga, which linked Tennessee's two major rivers, the Tennessee and the Cumberland, was completed in 1854, two years after the founding of the Tennessee Coal, Iron & Railroad Company. The first through train from Nashville arrived in Chattanooga on 11 February 1854.[113]

In seeking a direct rail connection from the Cumberland River at Nashville to the Tennessee River at Chattanooga and on to the eastern seaboard, Stevenson, the entrepreneurial son-in-law of Nashville banker John M. Bass (a member of the

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[112] Troost's report [House Journal appendix 1845-46, pp. 65-75] was critical to Overton and Nicholson's ability to spur interest in a route extending through the coal resources of the Cumberland mountains. S.J. Folmsbee,"The Origins of the Nashville & Chattanooga Railroad," *The East Tennessee Historical Society Publications* 6 (1934), 86.

[113]Zella W. Armstrong, *A History of Hamilton County and Chattanooga, TN* (1940; repr., Johnson City: Overmountain Press, 1993), 119.

Tennessee State Capitol Building Commission), may have imagined facilitating speedy transport of such valuable cargo as marble. An October 1845 *Southern Quarterly Review* article, "R. Road Communication Between Charleston, Savannah and Nashville," mentioned two marble quarries: one in east and one in middle. Perhaps talk of a Middle Tennessee quarry was booster rhetoric. Presuming the former referred to Rice's Hawkins County quarry, what could the latter have been? Since the publication was primarily concerned with railroad matters, could it have been referring to a downtown Nashville stone yard in which Nashville & Chattanooga Railroad President Vernon K. Stevenson had an interest? Such a business would certainly have been considered an important asset for the railroad he had begun planning in 1845. Whatever the case, Stevenson sold a considerable amount of stock in his new venture in Augusta ($250,000) and Charleston ($500,000) and enjoyed the staunch support of Senator John C. Calhoun of South Carolina.[114]

Meanwhile, Middle Tennesseans anticipated that the Louisville & Nashville railroad, chartered in both Tennessee and Kentucky in 1850, would intersect at Nashville with the Nashville & Chattanooga, and also at Guthrie, Kentucky, on the Kentucky-Tennessee line, with the Memphis and Ohio, which was served by the Memphis, Clarksville and Louisville Railroad.[115] Primarily funded by the city of

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[114] Armstrong, *A History of Hamilton County and Chattanooga, TN*, 119.

[115] Kincaid A. Herr, *The Louisville & Nashville Railroad, 1850-1963* (1964, repr., Lexington: University Press of Kentucky, 2000), 21-22.

Louisville and other Kentucky cities along the route, it was planned by savvy investors as the first leg of a modern transportation network that could forward northern goods into the heart of the Deep South. Historian Don Doyle has argued that with the completion of the L&N in 1859, Nashville was strongly pro-Union. No matter what their sentiments might have been, angry Nashvillians protested when Confederate soldiers burned the L&N railroad bridge before evacuating the city in advance of federal occupation in February 1862. After the bridge was repaired, Nashville benefited from continuous rail service during the war and the opportunity to serve as a supply center for the federal army.[116]

The Memphis & Charleston Railroad reached Stevenson, Alabama, on the Tennessee River, in early 1855. It shared the Nashville & Chattanooga tracks into Chattanooga; both lines relied on the Western & Atlantic to take them eastward to the port cities of Georgia or South Carolina. In May 1857, John C. Calhoun and a delegation including the Mayor of Charleston poured bottles of sea water into the Tennessee River at Chattanooga, and, later, into the Mississippi River at Memphis, in a ceremony designed to seal the bonds of commerce between neighboring Southern states.[117]

Meanwhile the roads of the East Tennessee & Virginia were being extended mile by mile to meet in the middle, beginning in Knoxville on one end and Bristol on

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[116] Don H. Doyle, *Nashville in the New South: 1880-1930* (Knoxville: University of Tennessee Press, 1985), 14.

[117] Ibid., 120.

the other. Colton's 1855 *Map of Kentucky & Tennessee,* in another instance of railroad boosterism, appears to have prematurely published the completed route. The celebrated joining of east and west branches of the line, near Greeneville, did not take place until 1858.[118]

Unfortunately for the Hawkins County marble industry, the ET&V bypassed Rogersville, whose citizens had resisted the efforts of the second wave of railroad promoters.[119] Was the Tennessee marble industry in Hawkins County already on the wane by this time, perhaps because the supply was beginning to be depleted? While some sources have indicated that a connection, called Rogersville Junction, between Rogersville and the main line at Bulls Gap had already been laid prior to the Civil War, no Pre-Civil War map has been found that reflects this.[120] *Harper's Weekly* published a "War Map of the State of Tennessee, Showing All the Strategic Points" soon after bridge burnings by Union loyalists had taken place in November 1861. On this map, which clearly showed the ET& V line from Knoxville to Bristol with stations in between labeled at Strawberry Plains, New Market, Morristown, Russellville, Greeneville, Rheatown, Jonesboro [sic], Carter, Union, Blountsville [sic],

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[118] John Fain Anderson's ca. 1900 memoir is based on childhood recollections of construction of the railroad by his father and uncles. ET&V President Samuel Blair Cunningham drove the last spike on 14 May 1858 at Midway, a town between Morristown and Greeneville, at Kibler's Field, 2 ½ miles west of Blue Spring. Archives of Appalachia, East Tennessee State University Library, John Fain Anderson papers; McGaughey, "A Succinct History of the Road ETN&Va," *Knoxville Register,* 21 May 1858.

[119] Price, *Hawkins County: A Pictorial History*, 276.

[120] Price, *Old Rogersville: An Illustrated History*, 241.

it showed neither Bull's Gap nor the spur line from Rogersville Junction to Rogersville.[121] J.T. Lloyd's *Official Map of the State of Tennessee,* published in 1863, showed a railroad stop at Bull's Gap, some sixteen miles south of Rogersville, almost directly below Mooresburg where the quarry William Dougherty was affiliated with was located, but gave no indication of a spur line up to Rogersville. According to economist William Nichols's study of the area's development, the completion of the spur off the Knoxville to Bristol line, not yet completed into Hawkins County, would be delayed for nearly a decade because of the war.[122]

One compelling bit of evidence that argues for a pre-Civil War railroad connection to Rogersville is an 1864 map created by United States Corps of Engineers Lieutenant Orlando Metcalfe Poe (figure 16). The map, drawn to scale, would have been of key importance to the federal army and created with the imperative of furnishing accurate data regarding transportation and waterways of upper East Tennessee.

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[121] *Harper's Weekly* 21 December 1861, 807.

[122] William H. Nicholls, "Some Foundations of Economic Development in the Upper East Tennessee Valley, 1850-1900," *Journal of Political Economy* 64, no. 4 (1956), 280-282.

Figure 15. Orlando M. Poe, *East Tennessee North of Loudon*, 1864. Courtesy Tennessee State Library and Archives.

On this map, Rogersville Junction is shown just above Bull's Gap, with a spur line running north, across the Holston River, into Rogersville. However, none of the reports from commanders on either side mentions a railroad bridge over the Holston at Rogersville, even during campaigns by federal commanders Samuel P. Carter (December 1862-January 63) and William P. Sanders (June 1863) when the objective seems to have been to destroy all railroad and other important road bridges in the upper East Tennessee corridor.[123] Thus, Hawkins County historian Henry Price may be correct in stating that the spur line (Rogersville & Jefferson or Tennessee & Ohio, both of which were chartered for the route from Bull's Gap to

[123] United States War Department, *The War of the Rebellion: a Compilation of the Official Records of the Union and Confederate Armies* (Washington, D.C.: Government Printing Office, 1880-1901), O.R. Series I, XX (1): 86-87, 88-92[Carter]; O.R. Series I, XXIII (1): 385-386, 386-389 [Sanders]

Rogersville in 1858) may have been completed only as far as the Holston River by 1861.[124]

Ironically, Tennessee State Geologist James Safford's 1855 map of the state's geology (figure 6) included no railroad lines at all, although the geological report that accompanied the map stated that the main marble veins, in Hawkins, Knox, and McMinn Counties, "are cut by navigable rivers, and many of them already by railroads, rendering practicable the opening of extensive quarries at hundreds of convenient and accessible points."[125] This same report acknowledged the Knox County location of a quarry being worked by James Sloan as within two miles of the East Tennessee & Virginia railroad.[126] Several marble businesses in Knoxville, including that of Nashville resident Sloan, were within close proximity of the new ET&V rail lines.[127] The ET&G and the ET&V, with separate terminals located side by

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[124] Price, *Old Rogersville*, 241.

[125] Safford, *A Geological Reconnoissance,* 105.

[126] "The production in Knox County has been considerable, and will rapidly increase. In 1852, Mr. James Sloan opened a quarry in a range of variegated marble, which, in its south-westward course, runs but little west, or north-west, of Knoxville. This range is many miles in length, affords an unlimited amount of valuable marble, and is intersected by the East Tennessee and Virginia Railroad, and we believe by the Holston. Mr. Sloan's quarry is admirably located on a low ridge, being not quite two miles north of Knoxville, and but a few hundred yards from the line of the railroad. From this point all of the variegated marble in our State Capitol has been derived." Safford, *A Geological Reconnoissance,* 108.

[127] It is possible that Zollicoffer was referring to Sloan's quarry in his Capitol Hill conversation with Captain Montgomery Meigs, although I have found no indication of any quarry ownership on his part in Knox County property deeds. As previously noted,

side in Knoxville, provided one of the longest continuous gauges of southern track railroad service.[128] Its completion in 1858 promised to make East Tennessee a through route for all connections west, with shipping, portaging, and rail connections via the Tennessee River to the Ohio and the Mississippi, and by river and rail to the Atlantic coast via Chattanooga and Dalton.[129]

The availability of railroad connections in Knoxville as early as 1855 gave the area marble industry a head start over its counterpart in the more isolated Hawkins County. The ease of access from river to rail meant that Knoxville marble quarries upstream could float blocks downstream to Concord for loading onto rail cars going south, or send them into Knoxville by wagon for transfer to the ET&V railroad going north and east. Marble mills and yards soon appeared either along the railroad lines and/or next to First and Second Creeks leading into the river just south of

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Sloan did own a Knoxville marble quarry by 1856. Prior to that he may have leased a quarry, or perhaps secured quarry rights through unrecorded leases.

[128] Standard gauge in the Southern states was 5,' while the width of the majority of rails in the North and Mid-West was 4'8.5." Roger Pickenpaugh has described the northern railroads as superior in many aspects. Many of the southern roads had thin strips of iron attached to wooden rails as opposed to iron rails. In addition, on the eve of the Civil War the South also had only about half as much rolling stock, and many of the lines entering major cities, particularly the port cities, were discontinuous. Roger Pickenpaugh, *Rescue by Rail: Troop Transfer and the Civil War in the West, 1863* (Lincoln: University of Nebraska Press, 1998), 19.

[129] The route from Chattanooga to Bristol would also be of critical importance to the Confederacy who hoped also to use continuous gauge railroad transportation along the main corridor for moving men and materials into the valley of Virginia. National Railroad Historical Society, "An Introduction to Railroads of East Tennessee and Western North Carolina" (Knoxville: NRHS Convention, 1975), 23.

downtown Knoxville.[130] Another factor in Knoxville's favor may have been the inflated value of the reddish-brown Hawkins County stone—the primary focus of marble work there since the late 1830s and 1840s, which had been sold almost exclusively for interior use.[131] Those desirous of using Tennessee marble as dimensional (exterior) building stone may have looked south to Knoxville where there was a greater variety of marble available and competition among suppliers may have helped keep prices down. Not only was there more than one belt of marble around Knoxville, but the pink and gray marbles occurred in more easily accessible locations.[132]

Almost immediately following the 1855 arrival of the East Tennessee & Georgia railway, whose tracks skirted the river's northern bank just west of Knoxville on the Tennessee River, the population of Campbell's Station shifted to a new locus. One or more marble quarries were also opened in the vicinity.[133] In anticipation of the railroad's arrival, James M. Rodgers, who owned land through which the train lines passed west of Knoxville, had subdivided his land into fifty-five

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[130]The *Standard History of Knoxville*, which was compiled in the late 1880s, made the assertion that "Marble is found along all the railroads running into Knoxville," as if marble had been discovered after the lines had been laid. Is it more likely that the railroad routes were politically-directed and railroad stockholders had tangible interests in mind when subscribing for shares of the new roads. Rule, *Standard History of Knoxville,* 204.

[131] *Goodspeed's*, 269.

[132] Gordon, 1911, 13, 15.

[133] S.L. King opened a quarry on the lands of W.T. Smith in Concord in 1856, according to *Goodspeed's*, 268.

lots and created a new village named Concord in 1854.[134] One family of stonecutters in Hawkins County, whose names included Galbraith and Winfrey, relocated to Concord soon after the railroad arrived in the latter town.[135]

By 1858, travelers and freight could be moved from Knoxville southward by train to ports that connected by ship, and to points north via rail into the Shenandoah Valley and beyond. Some sixty miles north of Knoxville, however, the main ET&V route skirted the Rogersville area where William Dougherty's suppliers lived. A group of prominent business leaders, including Orville Rice, had supported one of the earliest movements for railroad activity in the state when a rail partnership between East Tennessee and neighboring Virginia was under discussion. Nothing had come of the earlier effort, however, and when officials of the East Tennessee & Virginia Railroad came calling in the early 1850s, the citizens of Hawkins County refused to subscribe in large enough numbers to bring the railroad to Rogersville. Perhaps residents of a town that prides itself as one of the oldest in

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[134] National Register Nomination, Concord Village Historic District, entered 22 October 1987. According to the narrative description, one of the earliest homes in Concord is the extant circa 1840 Galbraith residence, 1100 Clay Road, a two-story, three-bay frame house on a stone foundation, with a double front door, transom and sidelights, and flanking brick end chimneys.

[135] The Winfrey Brothers Company continued in the skilled practice of stonesetting for large construction projects well into the twentieth century. Winfrey family history supplied by personal interview and correspondence with Andy Winfrey, Lexington, KY, and Frank Galbraith, Concord, TN.

Tennessee were concerned about losing valuable land within the city limits to the railroad right-of-way.[136]

Some of the most active promoters of railroads for the South became caught up in the increasing tensions between North and South over the right of individual states to sanction slavery. A study of the Southern Commercial Conventions that took place in 1857, 1858, and 1859 shows that delegates shifted earlier calls for the federal government to share in railroad funding, which had been made by John C. Calhoun and others at the 1845 convention and throughout the 1850s, to calls for support in each state.[137]

When Tennessee's Democratic Governor Isham Harris pledged to aid the other Southern states militarily after President Lincoln's call for troops to put down the insurrection at Fort Sumter in April 1861, he may have imagined the State of Tennessee serving as the main supply line for the Confederacy, since its rail lines now connected Memphis and Nashville to Charleston. After narrowly winning a referendum on the secession issue, Harris may even have envisioned the new Tennessee State Capitol as headquarters of the Confederacy.[138] But ordinary

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[136] Price, *Hawkins County Tennessee: A Pictorial History*, 61.

[137] Vicki Vaughn Johnson,*The Men and Vision of the Southern Commercial Conventions, 1845-1871* (Columbia: University of Missouri Press, 1992), 105-107.

[138] A map published in *Harper's Weekly* some months before the official outbreak of war, was accompanied by text describing Tennessee as being "destined to be the seat of war in the West" and the city of Nashville "which, according to some authorities, is destined to be the rebel capital." *Harper's Weekly*, 21 December 1861, 507. According to a summary of the building's history compiled by Mary Ellen Gadski, the building was offered as a potential capitol to the Confederate States and the CSA

Tennesseans, regarding their handsome new capitol building as the symbol of a state on the eve of prosperity in the growing urban center of a nation progressing westward, probably hoped to be spared that indignity. No doubt they also looked forward to the long-promised material improvements made possible by railways linking Tennessee not only to profitable new markets but also to the centers of politics and culture.[139]

The fact that East Tennessee experienced a decided economic boost from railroad development enhanced its Union sentiments. Statistics for 1859, three years after the Bristol & Virginia Railroad reached the state line, and one year after the East Tennessee & Virginia Railroad connected Knoxville and Bristol, reflect a decided jump in manufacturing output for Washington County, Tennessee, and gains for Knox County and the Tennessee counties.[140] The year 1859 represented a high point of early manufacturing development in East Tennessee, with businesses almost exclusively locally owned and financed.

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issued a twenty-dollar bill depicting the new Tennessee State House. Mary Ellen Gadski, *Tennessee State Capitol: Historic Structure Report* (Albany, NY: Mendel Mesick Cohen Waite Hall Architects, 1986), 39. Mary Ellen Gadski, The Tennessee State Capitol: An Architectural History" *Tennessee Historical Quarterly* XLVII, no. 2 (Nashville: Tennessee Historical Society, 1988), 93. Walter T. Durham, *Nashville: The Occupied City, 1862-1863* (1985, repr., Knoxville: University of Tennessee Press, 2008), image caption, 160j.

[139] The rail lines, which were vital for the transport of troops and war materiel, became strategic targets for both Union and Confederate armies. Their destruction is bound to have been a painful symbol of the cost of conflict to Tennessee's economic progress.

[140] Fishlow, 282.

Curiously, Hawkins and Cocke counties, where the railroad arrived in 1860 and 1870, respectively, experienced a temporary drop in manufacturing value: Hawkins for 1860, and Cocke for 1870 and 1880, after which they recovered to rank 6th and 10th in manufacturing output for the twenty-county area by 1900. It appears that the railroad may have come first to areas already showing strong economic development, rather than being targeted to garner the greatest revenue from the expansion of isolated resources.[141] No matter why the railroad network reaching East Tennessee developed as it did, the next several decades would see the state's manufacturing output totals dwarfed by those of the rest of the country—its wheat and flour production surpassed by Midwestern producers, and its iron industry outdone by new furnaces in Pittsburgh, Chattanooga, and Birmingham.[142]

With the outbreak of the Civil War, the newly opened lines would be seized for use as supply lines or damaged by retreating soldiers on both sides.[143] The East Tennessee & Virginia Railroad was considered one of the region's most important strategic assets. According to a recent dissertation by historian Spurgeon King, a great deal of military activity "revolved around defending or targeting the vital railroad lifeline."[144] Further development of the regional railroad network was

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[141] Ibid., 285.

[142] Ibid., 293.

[143] On 31 January 1862, the United States Congress passed an act allowing President Lincoln to seize telegraph lines and railroad lines. Pickenpaugh, 19.

[144] Written from the perspective of military strategy, this paper provides an analysis of the upper East Tennessee environment using cultural landscape

paralyzed, except for the rebuilding of critical railroad bridges along the East Tennessee & Virginia line by both sides.[145] Reports from commanders in the area in November 1863 refer to troops taking the train from Rogersville *to the river*, which suggests that although the railroad may have been completed from Rogersville Junction to the Holston River and from the river to the city of Rogersville there was no bridge across the river at that time.[146] Since there is no reference to a Rogersville railroad bridge on any pre-Civil War maps, and no mention of one being destroyed

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methodology. Spurgeon C. King, "The Geography of the Civil War: Conflict and Legacy in Upper East Tennessee, 1861-1865" (Ph.D. diss., Middle Tennessee State University, 2009), iii.

[145] The Confederate States Army actually scavenged iron from railroads (particularly spur lines) deemed unimportant and transported it for use elsewhere. One such incident appears to have occurred at Rogersville, during the occupation of the area by confederate troops. A letter from Lt. Col. A.L. Rives to Col. C.F. M. Garnett, dated 22 January 1864, indicates that such might have been the fate of the Rogersville branch railroad. "The condition of things in East Tennessee is such as to invite a prompt and vigorous effort to save the iron from the Rogersville Branch Railroad. This section of the country is now within our lines, and sufficiently protected to admit of the Operations (sic) of a working party employed on the removal of the iron, whilst the reconstruction of the bridges on the East Tennessee and Virginia Railroad, which, according to information received at the bureau, will be completed within a week, will afford means of transporting the iron removed from the road in question." O.R. Series I, XXXIII:60. As early as the spring of 1862, Confederate President Jefferson Davis was faced with the reality that in order to maintain the southern-owned railroad network, some roads were going to have to be sacrificed to supply others. Robert C. Black III, *The Railroads of the Confederacy* (Chapel Hill: University of North Carolina Press, 1998), 200.

[146] Reports of a battle near Rogersville on 6 November 1863, which resulted in the surrender of federal troops belonging to the Second East Tennessee Mounted Infantry, make no mention of a bridge across the Holston River anywhere near Rogersville, instead referring to various fords. Union Brigadier General James M. Shackelford wrote the day after the battle: "the enemy … has not exceeding 3,500 mounted men … his infantry will not cross the rivers … they are not doing one thing by way of rebuilding bridges, &c." O.R. Series I, XXXI.

by Union-sympathizing bridge-burners, one might assume that the bridge was not completed prior to the war.[147] However, since the railroad line appears complete on Orlando Poe's 1864 map (figure 16), perhaps federal army troops, once they regained possession of the area after Longstreet departed for Richmond in March-April 1864, built at least a temporary version of the long-anticipated bridge across the Holston River to Rogersville.

The post-Civil War growth of the East Tennessee marble industry and its proliferation in centrally-located Knoxville by the 1880s suggests not only the impact of the network of train routes emanating from that city, but also the possibility that investors—railroad men, corporate capitalists growing new manufacturing businesses, or perhaps even former Union soldiers who had been stationed in and around Knoxville—were among those who supported the expansion of the industry.

The Joining of Agriculture and Industry

Even though the state's economy may have been considered predominately agricultural by the powers in office during the 1870s, production had always been a mixture of staple crops, livestock, raw material resources, and a few manufactured goods. Historian Donald Winters has added considerable interpretive data to statistics collected during the 1940s by historians Frank L. and Harriet C. Owsley

[147] King, 40.

from county records and unpublished federal census documents. Their conclusion was that the majority of those engaged in agriculture in Tennessee and Alabama were middle class, mostly non-slaveholding, yeoman farmers who raised foodstuffs and a variety of crops for market—not planters engaged in monoculture cultivation.[148] Winters found specifically that while nearly all Tennessee farmers raised corn for subsistence, at least half were also producing a staple crop (tobacco, cotton, swine, wheat or other small grains and grasses such as flax or hemp, wool, silk) for the commercial market. Even though only around twelve percent of Tennesseans owned more than twenty slaves, Winters noted that the majority of those who voted for secession were agriculturalists tied to a rural lifestyle.[149]

Tennessee governors in the 1840s and 1850s acknowledged that collaboration between skilled laborers and small agricultural production was the status quo and they firmly believed that the state's natural resources were one of the building blocks of a sustainable economy.[150] Yet the state that had been one of the first to hire a state geologist did not create a Bureau of Agriculture until 1871. Yet in 1854, the General Assembly decided to engage in a second state geological

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[148] Frank L. and Harriet C. Owsley, "The Economic Basis of Society in the Late Ante-Bellum South," *Journal of Southern History*, 8, no. 1 (1940), 30; "The Economic Structure of Rural Tennessee, 1850-1860," *Journal of Southern History* 8, no. 2 (1942), 179.

[149] Donald Winters, *Tennessee Farmers, Tennessee Farming: Antebellum Agriculture in the Upper South* (Knoxville: University of Tennessee, 1994),121, 192.

[150] Whig Governor Neill Brown (1847-49) advocated for the opening of rivers and road construction to allow access to markets and private enterprise to "unlock the mountains and pour out the hidden stores of mineral wealth." He also claimed that "Her agricultural and manufacturing facilities are happily blended." White, 181-182.

survey, appointing James Safford, a geologist and professor of science at Cumberland University, who had begun to do forestry research. When the Bureau of Agriculture opened, he knew its new chief, Joseph Buckner Killebrew, from the forestry work. The two men became close colleagues, working together over the ensuing decades to promote the development of Tennessee's natural resources. Mining and agriculture would ultimately be merged into one department in Tennessee.

Curiously, given the state's progressive agricultural agenda, Tennessee was better represented by its minerals than its products of cultivation twenty years later at the 1876 Centennial Exposition in Philadelphia. The official program listed Safford as a member of the board of managers for Tennessee, but J.B. Killebrew seems not to have been involved. It is interesting to note that the organizational scheme for the main exhibit hall was conceived by mineralogist William Phipps Blake of the Smithsonian Institution. Blake promulgated a formulation that was to prove useful in coming decades of massive resource exploitation. Blake's presentation featured "raw materials" (mineral, vegetable, animal) as the foundation of all progress.[151] Safford, who had obviously gained national stature, was the judge of awards for Group I: Minerals, Mining, and Metallurgy, which included, in addition to the specimens themselves, processes, tools, and

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[151]Robert W. Rydell, *All the World's a Fair: Visions of Empire at American International Expositions, 1876-1916* (Chicago: University of Chicago Press, 1984), 20.

engineering.[152] Class 102 of this group included "building stones, marbles, slates, etc. Rough, hewn, sawn, or polished, for buildings, bridges, walls … or for interior decoration, or for furniture. Marble-white, black, or colored—used in building, decoration, statuary, monuments, or furniture, in blocks or slabs not manufactured."[153] Exhibitor 172 in this section is listed as follows: "Dougherty, E.D. Philadelphia. Blocks of Dougherty marble of Tennessee, rough and polished; pedestals, slabs, etc. The Dougherty marble is used in the U.S. Capitol, Treasury, South Carolina State House, and over one hundred and fifty other buildings, public and private, in all parts of the country. Operated since 1853. Quarry in Doughertyville, Hawkins County, Tenn." The only other mention of Tennessee marble in the program was St. Louis marble dealer Charles Williams, who advertised "Tennessee, Italian and Missouri marble work."[154]

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[152] United States Centennial Commission, *International Exhibition 1876 Official Catalogue* (Philadelphia: John R. Nagle & Co, 1876), 14-15.

[153] Ibid., 27.

[154] Ibid., 52. Others apparently displayed Tennessee marble at the Centennial. A short article reprinted by the *Georgia Weekly Telegraph and Georgia Journal & Messenger*, Macon, GA (issue 18, G, 21 December 1875), which was originally published in the *Knoxville Press and Messenger* (14 December 1875), reported that marble man John Hasson of Rogersville had sent an enormous block of variegated marble to Philadelphia to be "worked up into furniture for exhibition at the Centennial." Hasson, who was born in New York, is listed in the 1870 Hawkins County census as a railroad contractor; by 1880 he was a marble dealer. According to Hawkins County Historian, Henry Price, Hasson chartered his company in 1882, but was in business as early as 1872 when he shipped an enormous block of pink marble to New York. Price related that Hugh Scisson (sic) was one of Hasson's business associates and suggested that the marble columns for Baltimore City Hall may have come from Hasson's quarry. Price, *Hawkins County: A Pictorial History*, 163.

The second largest structure at the 1876 Centennial Exposition in Philadelphia was the Agricultural building, which contained ten acres of machinery for agriculture. Given the important role he was to play in Tennessee's own Centennial exposition two decades later, it is surprising that J.B. Killebrew and the state department of agriculture did not take a more active role in Philadelphia. Frank Leslie's *Historical Register of the United States Centennial Exposition 1876* noted pointedly that Tennessee did not build an exhibit structure for the Agricultural Hall, instead erecting a large tent for the exhibition of iron ore, coal and marble.[155] The article's compliment of the geological exhibits scarcely concealed a critique of the lack of agricultural representation from Tennessee: "The remarkably fine mineral exhibit made by Tennessee renders apology unnecessary for considering to some extent the character and resources of that State … (soil, timber, tobacco, cotton, hay, livestock coal, iron, copper)."[156]

According to historian Robert Wiebe, when a federal cabinet post for agriculture was created in 1889 many members of the public responded with surprise and resentment.[157] Americans might have been shocked to learn that agriculture, no longer the production of individual farmers, had already yielded in

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[155] Frank H. Norton, ed., *Frank Leslie's Historical Register of the United States Centennial Exposition 1876* (New York: Frank Leslie's Publishing House, 1877), 169.

[156] Ibid., 291.

[157] Robert H. Wiebe, *The Search for Order, 1877-1920* (New York: Hill and Wang, 1967), 126.

many places to the type of large-scale corporate farming (and mining) that was fast becoming the country's dominant mode of production. Enormously active in the post-Civil War decades, as a state official and a railroad man, Killebrew was a model "New South" advocate who promoted Tennessee's resources to industrialists and encouraged industry—particularly in the form of encouraging immigrant worker settlement.[158] He was an early disciple of New South doctrine, which touted the presence of abundant raw materials, moderate climate, and willingness to reunify with their northern countrymen and women as proof that the region was destined to prosper. In their optimism, New South advocates saw "industry" as an equivalent to agriculture.[159] In *The New South Creed*, historian Paul M. Gaston describes this misapplication of the industrial model adapted for a South that remained predominately rural and agricultural. In the "New South," an important means of modernizing the economy was "business agriculture," in which diversified agriculture and other "industries" were seen as a replacement for cotton monoculture.[160] However, when factories did begin to locate in the South, they flourished along the lines of plantation agriculture, conveniently keeping workers under the control of the company by maintaining the class divide between owners and workers. This often excluded African Americans from the workforce, thereby

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[158] Sam B. Smith, "Joseph Buckner Killebrew and the New South Movement in Tennessee" (Ph.D. diss., Vanderbilt University, 1962).

[159] Ibid., 2.

[160] Paul M. Gaston, *The New South Creed: A Study in Southern Mythmaking* (New York: Alfred A. Knopf, 1970), 64.

failing to institute either equality among workers or the kind of incentives for worker production, such as advancement into manager/owner status, which might have ultimately transformed Southern society.[161]

Another important tenet of business agriculture was that crops produced using new methods of scientific agriculture were seen as commodities to be exported or sold in national markets, with little emphasis on controlling their transformation or end-use at the state level. With the exception of Tennessee Coal and Iron Company—one of the first ante-bellum steel manufacturing enterprises in the South, which was integrated vertically, controlling mining, production, and transportation functions under one corporate structure—the state's mineral resources were viewed through the agricultural model, which considered raw or little-processed materials as commodities for export. Reflecting this formulation, Killebrew's official title soon became Commissioner of Agriculture, Statistics and Mines. In a very real sense, then, geology, which had been considered a stand-alone economic impetus in the early decades, appears to have been subsumed by a decentralized agricultural model in which numerous small producers contributed to the aggregate "crop" yield.

One result of this may have been that state programs did not assist or even actively encourage building large-scale marble mills or production plants. That was left to individuals who had capital, many of whom were outside investors.

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[161]Gaston, 218-20.

Post Civil War Growth of the Tennessee Marble Industry

The early promise of the marble industry in Hawkins County dimmed as the county's marble output was surpassed by that of Knox County. In a painful irony that reveals just how quickly Knoxville had risen to prominence, J.B. Burr & Hyde's 1872 publication, *The Great Industries of the United States*, was mistaken on the source location for the marble used inside the U.S. Capitol. This book, issued simultaneously in Hartford, Chicago, and Cincinnati, and written by a host of writers, including Horace Greeley, contained a four-page section on quarries. The anonymous writer of that section made several interesting assertions: that American marble was first used in 1804, in Philadelphia, for portrait busts; that Vermont quarries, not worked until the relatively late date of 1834, were producing both white marble and some of the finest American variegated marbles; that a brilliant red and brown variegated marble found in California was "much used for ornamental purposes"; and that the white marble found in Rutland, Vermont, considered equal to that of Carrara, had been used for several sculptures in the interior of the Capitol.[162] Apparently in error, the writer also noted: "The Knoxville, Tenn. red marbles have been considerably used in the interior of the Capitol Extensions at Washington, and in other government buildings."[163]

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[162] J.B. Burr & Hyde *Great Industries of the United States* (Hartford, Cincinnati, Chicago: Burr & Hyde, 1872), 1290.

[163] Ibid., 1291.

Ironically, as Knoxville's reputation as a marble center began to grow, one native son seems not to have noticed. In a memoir written soon after the Civil War, Francis Alexander Ramsey's son, the historian James Gettys McReady (J.G.M.) Ramsey, described the house he grew up in as having been constructed of pink granite with blue limestone corners, arches, and chimney.[164] Perhaps he was unfamiliar with the geological reports of Troost and Safford, neither of which identified granite anywhere in Tennessee. Nonetheless, it seems curious that Ramsey mistook the dark pink marble, which was quarried close by his boyhood home near the Forks of the River (Holston and French Broad) for red granite. And the introduction to his *Annals of Tennessee to the End of the Eighteenth Century* (1853) so closely mirrored the sentiments expressed in Troost's 1831 address to the Tennessee legislature:

> The forests of our boundless region, are daily falling before the ceaseless streams of civilized emigration; and populous towns are springing up, like an exhalation from the soil, changing the wigwam of the savage for the mansion of the white man, and the howlings of the wild beasts for the busy hum of social life.[165]

one cannot help but believe that Ramsey was not fully familiar with the eminent scientist and his explorations of East Tennessee geology. Ramsey's pre-war words:

> A feeling, somewhat dissimilar, but scarcely less intense, would be excited in the bosom of an aboriginal inhabitant of Tennessee, could he now revisit this

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[164] William Hesseltine, the editor of Ramsey's autobiography, which was not published until 1954, believed it was completed circa 1870. *J.G.M. Ramsey*, *Autobiography and Letters*, William Hesseltine, ed. (Knoxville: University of Tennessee Press for Tennessee Historical Society, 2002), xxxvi; *Ramsey*, *Autobiography and Letters*, 9.

[165] Troost, "Address," 192.

> theatre of his nation's existence. Could he stand upon an eminence, near the ancient capital of the state, and survey the scenes now presented to his view, he would notice with surprise the magic changes effected [sic] in this land of his fathers. The solitude of his native forest has given place to the industry and enterprise of a strange people; its silence is dissipated by the hum of business, and its quiet disturbed by the incessant toil and the active pursuits of civilized life. The ancient woods have been felled, and the wilderness converted to the purposes of agriculture. Associating the awakened recollections of his boyhood with unwelcome contrast, and, chagrined and sorrowful, seek elsewhere some solace to his wounded spirit. Repairing to the place where once stood the wigwam of his father, he finds erected over it the stately mansion of the white man. He recollects to have seen his chieftain recording his victories upon a tree, or perpetuating the annals of his tribe in rude hieroglyphics upon the mountain granite.[166]

reflected the pro-development temper of the time. Yet even though he had been an early railroad booster, he was wary of encouraging industrial development by northern capital.[167] And even though the majority of those developing the East Tennessee marble industry at the time he was writing his post-war memoir were local men, a quarry near his boyhood home was chosen as the source of marble for the new Knoxville Custom House. This substantial marble structure, erected 1871-74, was the first federal building project to come to the state, and one that would open the way for the use of Tennessee marble in future federal projects.[168]

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[166] According to this note in the online edition: "Much of this Introduction was taken from the 'Address' delivered by this writer at the organization of the 'East Tennessee Historical and Antiquarian Society.'" J.G.M. Ramsey, *The Annals of Tennessee to the End of the Eighteenth Century.* Charleston: Walker and James, 1853. Electronic edition Rockwood, TN: EagleRidge Technologies. http://www.roanetnhistory.org/ramseysannals.html. [accessed March 3, 2011].

[167] William Hesseltine, "Preface" in: *Ramsey*, *Autobiography and Letters*, xxxiii.

[168] The Knoxville Marble company, founded by George W. Ross and William Patrick in 1873, has historically been linked to the "federal" quarry that furnished marble for the Knox County Post Office/Customs House. Either this quarry or one very

A comparison of manufacturing census data for Knox and Hawkins counties in 1850 and 1880 reveals the impressive growth of the marble industry after the Civil War. The industry went from one to at least twelve companies in three short decades. The data on manufacturers in Tennessee is incomplete for 1860 and 1870, and none appears to exist for Hawkins or Knox counties in those years.[169] By 1880, however, the U.S. *Census of Manufactures* showed that the growth of the industry in Hawkins County had been more than outpaced by a proliferation of quarries in Knox County. It also indicated that the principal outside markets for Tennessee marble in the 1880s differed for Hawkins and Knox counties.[170] Perhaps due to the East Tennessee & Virginia Railroad's network of connections up into the mid-Atlantic, or to the presence of the Baltimore-based Evans & Son, which had first built a marble production mill in Hawkins County, then moved to Knoxville to open a mill in 1888,

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near it was probably the source for that building's marble in 1871-2. While no document confirming either government ownership or lease of this quarry has been found, various sources have suggested that the marble from this quarry was also used for the St. Louis Custom House, designed by the same architect and erected approximately the same time as the Knoxville building. Tennessee marble, supposedly from this same quarry, was used for the Memphis Custom House some ten to fifteen years later.

[169] The microfilmed *Census of Manufactures* for the year 1860 in Tennessee, organized alphabetically by county, is missing the group of counties from Anderson to Lewis, which includes Hawkins and Knox. For the year 1870, data is also missing for the alphabetical group Grundy to Lewis, which would have included both Hawkins and Knox counties. National Archives and Records Administration, United States Bureau of the Census, Washington, DC. *Seventh Census: Manufactures* (1850); *Eighth Census: Manufactures* (1860).

[170] National Archives and Records Administration, United States Bureau of the Census, Washington, DC. *Tenth Census,* vol. 2: *Manufactures* (1880).

all four quarries in Hawkins County named Baltimore as their principal market.[171] Those in the 4th district (Mooresburg) indicated that marble was shipped by wagon and rail, while those in the 3rd district shipped directly by rail. By this time Orville Rice's firm was, apparently, no longer active. The earliest Hawkins County marble business being Needs's, which was founded in 1850 with invested capital of $500 and by 1880 doing well enough to employ fifteen workers.[172] The other three firms, each supporting between forty-eight and sixty workers at the time of the census, were: Daugherty's (sic), begun in 1864 with $8,000; Stamps's, founded in 1870 with $7,000; and Hasson's, started in 1872 with $10,000.[173]

The Knox County Census of Manufactures told a very different story. In 1880, there were eight quarries in operation in five separate districts. They listed their principal markets as Memphis, New Orleans, Cincinnati, United States East & West, New York, Philadelphia, and Knoxville. Transportation varied from railroad, to

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[171] Evans & Son, which had mills in both Hawkins and Knox Counties by 1888, acquired the Knoxville Marble Company quarry, which is thought to have been the former "federal" quarry, from which the marble for the Knoxville Custom House was extracted. The transaction was recorded in a 1 June 1899 deed between Knoxville Marble Company, a corporation of Knox County, Tennessee, and David Ross, John M. Ross, and J. Edward Ross (heirs of George W. Ross) and the Evans Marble Company, a corporation chartered under the laws of the State of Maryland and authorized to do business in the State of Tennessee, for $5950. Knox County Archives.

[172] Needs's Quarry is not listed in the 1850 census of manufactures.

[173] The founding date for this company contradicted the 1853 date in the program listing for E.D. Dougherty (son of William Dougherty) at the 1876 Philadelphia Centennial.

railroad and water, to wagon (for those who sold locally).[174] The largest firm, Currey & Boone, which listed its principal market as "United States East & West," reported invested capital of $20,000, employed sixty workers, had four machines, and used waterpower from the Holston River. R. H. Armstrong & Co, with its principal market as New York, employed nine workers, had three machines, and used waterpower from the Tennessee River. Capitalization ranged from $750 to $5,000 and value of output from $400 to $12,000 annually. Three of the operators (two of the very earliest) were firms including the name Edington. Two firms employed fifteen workers and shipped marble by wagon to locations in Knox County. The third Edington firm, founded in 1880, was shipping marble to Cincinnati via rail. This firm employed twelve workers, and had one machine powered by the waters of the Tennessee River.[175] Curious omissions from the 1880 rolls were John J. Craig and George Ross, both of whom are documented as already being engaged in the Knox County marble business by that date.

By 1883, a marble-finishing mill (Juanito [sic], which was sold to Enterprise Marble Company three years later) had been erected in Concord. At least four other companies were in operation at this busy railroad junction about eight miles west of

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[174] The names of the quarry owners and dates of founding were as follows: Brown & Clark (1879); Johnson & Bro (1879); Edington & Co (1880); Currey & Boone (1879); R.H. Armstrong & Co (1880); East Tennessee Marble Co (1879); R.E. Edington & Bro (1870); Robt & John Edington (1872).

[175] U.S. Bureau of the Census, *Tenth Census*, *Volume 2: Manufactures* (1880).

Knoxville: the Lima & East Tennessee Marble Company, Stamps Wood & Company, Stewart Company, and Republic Marble.[176]

Goodspeed's History of Tennessee included a much more extensive list of quarries in Knox and Hawkins Counties, as well as a few in Hamblen County and Bradley County (near the Hiwassee).[177] The authors of *Goodspeed's* volume, which is more valuable as a compendium of corporate interests and prominent business leaders than as a history of the state, gathered information on quarries in 1884, describing the development of marble quarries near Knoxville as "one of the most promising fields of industrial activity in East Tennessee" and noting that it was expanding rapidly.[178] Added to the four Concord-area businesses already mentioned, this suggests that there were between twenty-five and thirty marble businesses operating in Tennessee by the mid-1880s.

While a large percentage of these businesses seem to have opened since 1880, there are still many discrepancies between the lists found in these sources.

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[176]National Register Nomination, *Concord Village Historic District*, entered 22 October 1987.

[177]The listings in *Goodspeed's* include the following Hawkins County companies: Prince & Co., Chestnut & Chestnut, John Harnn & Co., Chestnut & Fulkerson, James White, Dougherty Quarry, Joseph Stamps, and Baltimore Marble Company. Knox County companies in *Goodspeed's*: Cross Cut Marble Company, Morgan & Williams, John M. Ross, Craig & McMullen, T.P. Thomas & Co., R.H. Armstrong & Co., H.H. Brown & Co., Harvey & Smith, Franklin Marble Company, Beach & Co., C.D. Ross & Co., and Lima & East Tennessee Marble Company. Knox County marble mills in operation in 1884 were: Knoxville Marble Company, Morgan & Williams, Beach & Co., and Crescent Marble Company.

[178] *Goodspeed's History of Tennessee, illustrated* (Nashville: The Goodspeed Publishing Company, 1887, reprinted Easley, S.C.: Southern Historical Press), 267.

Perhaps there was considerable turnover in company ownership, for few names in the 1884 data are congruent with the names on the 1880 *U.S. Census: Manufactures*. While this might indicate a wave of incorporations or consolidations during a period of rapid growth, it may also be a result of the fact that information for the *Goodspeed's* volume was collected for the purpose of promoting local business. Not only registered business names but also the names of individuals involved informally in the industry through ownership or leases on private lands may have been included. Tennessee began incorporating businesses in 1854. The documents of incorporation for several early firms include names of out-of-state investors. Research into public records, such as property deeds and court cases, reveal interconnections between incorporated companies and their counterparts in the region and in other sections of the country.[179] The number employed in all marble

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[179] Historian Sean Patrick Adams has compared the incorporation laws of Pennsylvania and Virginia during the 1850s to show how Pennsylvania lawmakers took it into their hands to promote the coal mining industry's growth. Virginia's decentralized charter-granting system left the power in local hands, ultimately slowing and even stopping coalmine investment in many counties. Sean Patrick Adams, *Old Dominion, Industrial Commonwealth* (Baltimore: Johns Hopkins University Press, 2004), 173-187. At least three of the early marble company incorporations in Tennessee were filed in Nashville: the Knoxville Steam Mill Company, organized 29 February 1856 (Knox Deeds, Book V, 401); the Sligo Mining and Marble Company & Corporation, chartered 1 February 1854 (Knox Deeds, Book U, 246); and the Dickeson Mining & Marble Company, incorporated 21 February 1856. Montroville W. Dickeson, *Report of a geological survey and examination upon the lands owned by the Dickeson Marble and Zinc Mining and Manufacturing Company of Tennessee* (Philadelphia: J. Hufty, Stationer, 139 Chestnut Street, Above Fourth, 1856). Enclosed within this document is the following: Copy of an Act to Incorporate the Hibernia Mining Company … and others including The Dickeson Marble and Zinc Mining Manufacturing Company. Section 21: Be it further enacted, that M.W. Dickeson, M.D. John W. Tilford, and George R. Hazwell, ... Passed Feb. 21st, 1856, Neil S. Brown, Speaker of the House of Representatives, Edward S. Cheatham, Speaker

businesses of East Tennessee was estimated at two thousand by the authors of *Goodspeed's*; the Knox County marble businesses listed their invested capital as $250,000.[180]

East Tennessee's rail lines and other industrial infrastructure had suffered tremendously during the War; the area had been a crossroads of competing armies who used whatever was at their disposal, particularly anything within or near railroad yards or waterways, as needed for transportation or equipping of soldiers.[181] But the post-Civil War growth of the East Tennessee marble industry and its proliferation in the centrally-located Knoxville area by the 1880s suggests that the network of rail lines emanating from that city was quickly restored, which also raises the possibility of involvement of outside interests and capital. As will be explored in the final chapter, the national railroad network would in large measure chart the course of usage for Tennessee marble.

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of the Senate. Knox County Public Library, McClung Historical Collection. By 1899, however, the Knoxville Marble Company is described as "a corporation of Knox County," which indicated that counties were later granted the power to charter corporations. Knox County Archives, Deeds, Volume 159, 118.

[180] *Goodspeed's,* 268-70.

[181] In addition to the "recovery" of iron by both armies from destroyed or idled railroad tracks, resourceful topographical engineers appropriated whatever was necessary for the creation of fortifications or battlefield defense. According to Dr. Joan Markel, Curator of a permanent Civil War exhibition at the University of Tennessee's Frank H. McClung Museum, Captain Orlando Metcalfe Poe, United States Corps of Engineers, used telegraph wire found in Knoxville rail yards not only to secure a pontoon bridge across the Tennessee river but also in the creation of the abattoir that so dismally frustrated the efforts of Confederate soldiers to reach Fort Sanders in November 1863.

However, in the immediate post-Civil War period, with growing competition in Hawkins County, and railroad access still difficult if not impossible (if in fact the line between Rogersville and Rogersville Junction had been scavenged by Confederate troops), William Dougherty may well have decided to move his operations to Memphis, or at least to open an outlet there.[182] The reopening of rail and steamboat routes at Memphis provided access not only to the upper South but also to St. Louis—the erstwhile capital of the Midwest before the Civil War. By 1867, Dougherty had opened a business in Memphis where he likely controlled the market for table and bureau tops made of the colorful, highly patterned Hawkins County marble so appealing to Victorian taste.[183] Perhaps the Memphis storefront business was merely a sideline for a man used to overseeing large-scale building projects, but it is also possible that during and immediately after the war years Dougherty needed a sure thing. With rumors of new federal building projects on the horizon for Tennessee (Knoxville's combination custom house, court house and post office, would begin construction within five years, with similar buildings in the offing for

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[182] The U. S. Census of Manufactures for 1880 recorded that Dougherty's company had been founded in 1864 and capitalized with $8000. Two other similarly well-capitalized firms, Stamps's and Hasson's, founded in 1870 and 1872, may have presented a challenge to his ambitions.

[183] A letter from Walter to Dougherty on 30 September 1857 mentions Dougherty's having just returned from a recent trip [to Tennessee, perhaps?] and asks if he has "the bureau tops in hand?" It also mentions having learned from Sisson [Hugh Sisson] that they were not being made at his establishment [Sisson's marble company was in Baltimore], which suggests that Dougherty must have had some other means of manufacturing Tennessee marble for domestic use. A postscript mentioned having "worked in another small lot of Tennessee," at the U.S. Capitol. Architect of the Capitol, Thomas U. Walter letterbook.

St. Louis, Nashville, and Memphis), he may have hoped to position himself by establishing his business away from lingering bitterness in the East or Middle Tennessee as the former locus of Tennessee's partisan politics. If, in fact, Orville Rice had lost his business to disgruntled Unionists, Dougherty may have felt it best to remove himself until Hawkins County sentiments calmed. He may also have decided to become a marble broker instead of being tied to one quarry, given the diminishing supply of large-scale marble in the Hawkins County quarries.

And, while the buildings in which Dougherty had invested his time and expertise in Washington, D.C. had been spared, the destruction of the potentially irreplaceable monolithic columns of Hawkins County marble in South Carolina was undoubtedly traumatic for Dougherty, Niernsee, Sisson, and all involved. Unfortunately, William Dougherty did not live to see the industry's recovery to national prominence. At his death on 5 November 1867 in Memphis, he and his son Edward D. Dougherty were proprietors of a marble "ware room" located at 147 Main Street.[184]

In Knoxville, a number of leading businessmen, known "Union men," had left the city during the war years. Among these were John J. Craig, R.H. Armstrong, and Perez Dickinson. There is some evidence that some or all of them were engaged in the fledgling marble business, or at least in marble real estate speculation, prior to the Civil War. Perez Dickinson had come to Knoxville to teach at Hampton-Sidney

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[184] Obituary of William Dougherty, *Washington Evening Star* 7 November 1867; Condolence letter to Edward D. Dougherty. National Archives and Records Administration, RG 42, Washington National Monument Society papers.

Academy in 1830 and made his fortune in the mercantile business by partnering with brother-in-law, James Harvey Cowan. [185]Upon his return to the city after the war, he acquired his Island Home property, situated just south of the Forks of the River where the Tennessee River assumes its full flow.[186] It is possible that one of the several fine veins of marble that have been mined on this property might have been the early Williams quarry.[187]

R.H. Armstrong had shown a strong interest in and knowledge of marble on his 1850-51 visit to the Capitol and Washington National Monument—a trip on which he had been invited as a companion to O.P. Temple. Temple's railroad boosterism may have alerted Armstrong to the possibilities of Tennessee marble as a potentially profitable export. Given his prescient remarks about the Tennessee blocks he had seen at the Washington National Monument, and the proximity of the Armstrong family's Kingston Pike property to the river, Armstrong may have entered into the marble business prior to the war. His signature on an 1880 lease confirms that he was engaged in a marble quarry on River Road in Knoxville's Thirteenth District. This deed, drawn up between a local Union veteran and the

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[185] Rule, 227.

[186] Dickinson purchased "Williams Island" from Colonel Thomas L. Williams in 1869 and developed it into a six hundred acre farm estate. William J. MacArthur,Jr. *Knoxville: Crossroads of the New South* (Knoxville: East Tennessee Historical Society, 1982), 58.

[187] Interpreting the closed quarries of the once-burgeoning marble industry as a cultural landscape, the Ijams Nature Center directs hikers on walking paths through two turn-of-the-century quarries, called "Ross's" and "Mead's," with interpretive signage that includes photographs of marble workers and their families.

Tennessee River Marble Company, recorded Armstrong as that company's president.[188]

John J. Craig became one of Knoxville's most successful marble entrepreneurs. Whether he had an interest in the industry before the war is unclear. Arriving in Knoxville in 1839, he had been employed by the mercantile firm of McClung, Wallace & Company. In 1847, after marrying the daughter of the prominent and wealthy William Lyon, he left with his new bride, Mary, for his native Alabama. They returned to Knoxville in either 1852 or 1854, where he was employed by the Union Bank until it closed during the Civil War.

The string of companies and affiliated businesses founded by Craig (b.1820-d.1892) and later led by his son John James Craig (b. 1860-d.1904) would ultimately form the heart of Knoxville's marble industry. This chain of ownership and development may have begun before and possibly even continued during the Civil War, even though Craig and wife and infant son were reportedly absent from the city during the majority of the war years and for nearly a decade thereafter.

Craig was one of many Knoxville citizens opposed to Tennessee's separation from the Union. According to O.P. Temple, Craig was among the group of at least thirteen unionists who issued a call for a May 1861 convention in East Tennessee to discuss a course of action with regard to the possible secession of the state of

[188] Knox County Public Library, McClung Historical Collection, Adam T. Cottrell Papers, folder 13.

Tennessee.[189] Craig and his young family left Knoxville sometime in either 1861 or 1862 and went to Cincinnati.[190] Craig later relocated to New York, where he is thought to have worked in banking until 1869.

An intriguing chain of Knox County property deeds during the war shows Craig, who may have been representing the Union Bank in an attempt to secure an outstanding loan, as a party to a court transaction regarding Montroville W. Dickeson, of Philadelphia, who is characterized in an 1863 document as an "alien enemy." The sequence of events recorded in public records began on the 31st of October 1856, when the Knoxville Steam Mill Company purchased, from the Knoxville Manufacturing Company, a lot on Second Creek at Broad Street, near the Machine Shop of the East Tennessee & Georgia Railroad. The signatures of Knoxville Manufacturing Company's President, Daniel Clark, and Treasurer, John Fisk, were notarized on 7 November 1856 in Hillsborough, City of Manchester, New Hampshire, suggesting that the company may have had one or more owners from New Hampshire. Craig, along with Thomas C. Lyon; his brother-in-law, A. A. Barnes (Barnes was married to Mary Lyon's sister); and two other men are listed as owners

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[189] Other signatories were F.S. Heiskell, C.F. Baker, S.R. Rodgers, Dr. W. Rodgers, John Baxter, C.F. Trigg, David Burnett, John Williams, W.H. Rodgers, John Tunnell, W.G. Brownlow, and Temple himself. Oliver Perry Temple, *East Tennesseans in the Civil War* (Cincinnati: Robert Clarke Company Publishers, 1899), 340-41.

[190] Located just north of the Ohio River, Cincinnati, which served as a refuge for some who wished to escape the conflict, housed a relief organization for East Tennessee residents. Mary U. Rothrock, *The French Broad Holston Country* (Knoxville: East Tennessee Historical Society, 1946), 143-4.

of the Knoxville Steam Mill Company by 1859.[191] An 1862 deed of trust for the same property, which had been purchased from the Knoxville Manufacturing Company in 1856 for $1750, was signed by R. Craighead, Secretary and Treasurer of the Knoxville Steam Mill Company, and conveyed from the Knoxville Steam Mill Company to John J. Craig. The deed carried the information that the Knoxville Steam Mill Company was indebted to the Branch of the Union Bank at Knoxville for $19,800 with a note payable twelve months from its 11 December 1862 date. In this deed, John J. Craig, Trustee, was authorized to sell the property and pay off the debt if it was not satisfied by the end of the indenture term.

Another deed, executed 29 July 1863, conveyed a piece of property *to* the Knoxville Steam Mill Company, and under very different circumstances. This document references a decree from the Confederate States Eastern District Court, in Knoxville, in November 1862, in the case of the Confederate States versus Robert Armstrong. In that ruling, the court had decreed that a tract of land purchased from James W. Welcker by Montraville W. Dickinson [sic] of Pennsylvania, "an alien enemy," was to be confiscated. The description claimed that the property [purchased 1 February 1856, in which Dickinson had an undivided interest] was

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[191] The 1859 Knoxville city directory listed two other owners: Robert J. McKinney and Robert Craighead, noting that the company was capitalized with $50,000, and classified it under "marble mill." Under "Marble Dealers" in the same directory, the only names are Geo W. Fagen & Bro. and Sligo Marble and Mining Company, located at the corner of Water Street at the ET & VA Railroad, with O.H. Rogan listed as Trustee. In addition to being an owner of the Knoxville Steam Mill Company, John J. Craig is also listed in this directory as Cashier, Union Bank. *Williams' Knoxville Directory, City Guide, and Business Mirror* (Knoxville: C.S. Williams, 1859).

wholly owned by "a Company in the State of Pennsylvania, all alien enemies," and that right and title be "sequestrated and divested out of them and vested in the Confederate States of America." A public sale had taken place in May of 1863, at which A.A. Barnes had purchased the property for $3800.[192] The July 1863 document carried out Barnes's request that the property be divided between the Knoxville Steam Mill Company and A.L. Maxwell, Jr.[193]

Perhaps the former transaction had only to do with Craig's position at the bank, where he might have been in an uncomfortable situation regarding the indebtedness of a company in which he had an interest. In the second situation, it is possible that this complicated transaction was designed to protect the interests of Dickeson. If Dickeson was somehow associated with Knoxvillian Robert Armstrong, as the heading of the court proceedings indicates, perhaps Craig and/or his in-laws either knew him or were also engaged in business with him. Armstrong may already have left the city by the time these events occurred and Craig is said to have departed once the bank closed. Perhaps Barnes had offered to assist him in

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[192] T.J. Campbell, Receiver, to The Knoxville Steam Mill Company and A.L. Maxwell, Jr., 8 August 1863. Knox County Archives, Knox County Property Deeds. No documents have been found that reveal what might have been the relationship of Robert Armstrong to Dickeson, Dickeson to John J. Craig or A.A. Barnes, or Craig or A.A. Barnes to Armstrong.

[193] In a dispatch to General Braxton Bragg, which was sent soon after federal forces burned bridges at Flat Creek and Strawberry Plains, Tennessee, in June 1863, Major General S.B. Buckner wrote: "Please grant permission to [A.L.] Maxwell to rebuild them at once." O.R. Series I, XXIII (2):882; Anthony Leggett Maxwell was a New Yorker who had moved to Knoxville and set up an iron manufacturing business before the war. MacArthur, 40.

preserving his Tennessee assets by purchasing them at court-ordered auction after their "sequestration" by the Confederate government? Perhaps it is only a coincidence, but the Dickeson Marble and Manufacturing Company had been chartered in Tennessee in 1856, the same year as the Knoxville Steam Mill Company. Dickeson's concurrent report to his shareholders mentioned locations of marble quarries in and around Knoxville and paid particular notice to the about-to-be completed East Tennessee & Virginia Railroad.[194]

Historian William Bruce Wheeler has asserted that Knoxvillians, ever entrepreneurial, were anxious to get back to business at the close of the war. Wheeler refers to some of the leading citizens who left during the war as "transitional" figures: northern investors engaged primarily in the mercantile economy, such as Perez Dickinson, whose firm Cowan and Dickinson had added young Frank McClung as partner in 1858.[195] Not only was Perez Dickinson welcomed back with open arms, but the business partnership resumed despite the sentiments of the Confederate-leaning McClung, who sat out the war working in his

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[194] Montroville W. Dickeson, *Report of a geological survey and examination upon the lands owned by the Dickeson Marble and Zinc Mining and Manufacturing Company of Tennessee* (Philadelphia: J. Hufty, Stationer, 139 Chestnut Street, Above Fourth, 1856). Enclosed within this document is the following : Copy of an Act
To Incorporate the Hibernia Mining Compan … and others including The Dickeson Marble and Zinc Mining Manufacturing Company. Section 21: Be it further enacted, that M.W. Dickeson, M.D. John W. Tilford, and George R. Hazwell ... Passed Feb. 21st, 1856, Neil S. Brown, Speaker of the House of Representatives, Edward S. Cheatham, Speaker of the Senate. McClung Historical Collection, Knox County Public Library, Vertical file.

[195] Rule, 227-28.

uncle's Abingdon, Virginia salt works.[196] The post-war governor, ardent unionist William "Parson" Brownlow, was apparently of the same frame of mind, offering pardons to the vast majority of those from his former hometown who requested them.[197]

Hawkins County Historian Henry Price has suggested that something similar may have taken place concerning Orville Rice's business in Hawkins County, but in an opposite set of circumstances. Orville Rice's quarry and his business assets, which were supposedly confiscated by the federal government two years after the war ended, were purchased by neighbor James Gouldy and sold back to Rice and two partners twenty years later.[198] Or perhaps, in both cases, it was a matter of opportune investment.

The most important post-war architectural project in Knoxville was the federal Customs House and Post Office (figure 17) designed by supervising architect of the Treasury Department Alfred P. Mullett.[199]

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[196] Joan Markel, exhibition text for Civil War display, 2010, Frank H. McClung Museum, University of Tennessee, Knoxville.

[197] William Bruce Wheeler, *Knoxville, Tennessee: A Mountain City in the New South* (Knoxville: University of Tennessee Press, 2005), 3, 5, 8.

[198] Hawkins County historian Henry Price cites the authority for this seizure under the "Confiscation Acts of 1861-61" in which the U.S. Government claimed that "he had engaged in armed rebellion against the United States under and by authority of the so-called Confederate States of America." Price, *Hawkins County: A Pictorial History*, 160.

[199] Mullett (1834-1890), who had trained under the previous Supervising Architect of the U.S. Treasury, architect Isaiah Rogers, was appointed to the position in January 1866. During the two administrations of President Ulysses S. Grant, Mullett

Figure 16. Alfred B. Mullett, Custom House, Knoxville, Tennessee, Photograph circa 1904, Detroit Publishing, Library of Congress Prints and Photographs Division. Wikimedia Commons license.

The erection of this building appears to have prompted the opening of another of Knox County's leading marble companies. Ross family patriarch George W. Ross moved to Knoxville from Athens, apparently to oversee construction of the federal building.[200] The marble was quarried in the vicinity of the Forks of the River

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oversaw the construction of as many as thirty-two federal buildings, including the north wing of the Treasury building in Washington, D.C., the Court House and Post Office in Knoxville, and the Custom House and Post Office in St. Louis. Mullett served in the post until 31 December 1874. National Register Nomination 68000053, Old Post Office [United States Customs House and Post Office], St. Louis, MO.

[200] Obituary of John M. Ross, 15 April 1940, *Knoxville News Sentinel*. George W. Ross and his family moved to Knoxville in 1870, where he entered the marble business. His son, John M. Ross (b. 1857), learned the business by working as a quarryman. He built a mill on the south bank of the Tennessee River at Island Home.

beginning in 1871, either under the auspices of the federal government directly or by lease or contract to the building contractors, either the predecessors or founders of the Knoxville Marble Company.[201] According to the *Standard History of Knoxville,* published in 1900, "The Knoxville Marble Company was organized July 11, 1873, members of the company at the time being William Patrick, president; George W. Ross, secretary and treasurer; James Patrick and J.H. Holman. This company purchased the old government quarry at the junction of the Holston and French Broad rivers, which they have operated ever since, where they now have three quarries on their sixty-five acres of land."[202]

By this time, John J. Craig was actively engaged in buying and leasing quarries in two of the most promising areas: both near the confluence of Holston and French Broad Rivers and further south of Knoxville in the vicinity of Louisville and Friendsville. The quarry he opened east of the city in 1878 had two additional partners: W.B. McMullen and J.M. Edington. The John J. Craig Company, Quarries and Dealers in marble, is listed in the Knoxville city directory for 1882.[203] In addition, Craig proved himself an able businessman by arranging several combines or consortiums of Knoxville marble resources in order to develop the best possible

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[201] George Ross and William Patrick were also partners in Tennessee Producers Marble Company by 1878.

[202] J. Wooldridge, "Manufacturing Interests" in William Rule, ed. *Standard History of Knoxville,* 204.

[203] Lucille Deaderick, *Heart of the Valley* (Knoxville: East Tennessee Historical Society, 1976), 510.

market share. In 1885, he was a founding partner in Great Southern Marble, enlisting men whose names appear in other sources as already associated with the marble industry: T.S. Godfrey, R.H. Brown, T.W. Keller, J. Oelling Brown. The Tennessee Producers Marble Company, which was reorganized as a stock company in 1894 under the leadership of Craig's former general manager, W.B. McMullen, apparently built a large mill to serve quarries located in Knox, Blount, and Hawkins Counties. [204] This company would also serve as marketing and sales agent for Great Southern and W.H. Evans, successor to the Evans & Son Company of Baltimore, which had located first in Hawkins County and later moved into the Knoxville market.

Another of Knoxville's pioneering marble men, northern-born William Spies Mead (1833-1908), came to the city soon after the Civil War to work in the iron industry. Mead, a New Yorker by birth, appears in New York City directories as a clerk (no firm specified) at age 17 and as a grocer working in his father's grocery business from 1860-1872.[205] By 1873 he had moved his wife Fanny and two young sons, Arthur and Frank, to Knoxville where he immediately became a shareholder and board member at Knoxville Iron Company, incorporated in 1868 and already mining coal in Anderson County, Tennessee. Mead was elected Secretary of the company the year he arrived, President and Treasurer in 1874, and Vice-President

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[204] Wooldridge, 205-07.

[205] New York City directories 1850, 1861-1866, 1867, 1872; US Census 1850, 1860, 1870 as referenced in: Danette Welch, "Biographical Profile of William Spies Mead," unpublished, Knox County Public Library, McClung Historical Collection.

in 1875.[206] Knoxville directories list Mead as vice-president or secretary-treasurer of Knoxville Iron Company from 1876-1886. By 1887 he had changed industries, becoming secretary at Brookside Mills. In this year and the following, he is also listed as president of the Tennessee Marble Association.[207] Mead's two sons, Arthur and Frank, are also listed in the city directories, beginning in 1885, residing with their father at 204 Hill Avenue. By 1889, both sons are engaged in business: Arthur E. Mead, President, Republic Marble, and Frank S. Mead, President, Miller Cracker. Also listed under the Mead name in 1889 are the quarries of Republic Marble, Concord, TN. By 1893 both Arthur and Frank were in the marble quarry business. After Arthur's accidental death in January 1894, Frank became President, Republic Marble Company. Sometime in 1900, father William assumed the positions of Secretary and Treasurer even though he was still listed in the 1900 U.S. Census as an iron manufacturer. Frank, who is identified as a marble manufacturer, was President of Republic Marble and Secretary - Treasurer of Ross Marble, with both companies having the same office address.[208] At some time during the early 1900s, the two companies were apparently joined to become the Ross-Republic Marble

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[206] Wooldridge, 208-10.

[207] This association may have been a group of business affiliates.

[208] Correspondence in the construction records of the J.P. Morgan Library reveals that the two companies submitted identical bids on separate letterhead but with the same address (6-8 McNutt Building, post office box # 397) to furnish marble blocks and slabs for the library on 10 September 1901. On 12 September 1901, John M. Ross, Marble Dealer, P.O. Box 398, submitted his own bid for blocks only, but with same prices, wording, and terms. New-York Historical Society, PR042: Morgan Library, Box 28.

Company. The John M. Ross Company, whose president John M. Ross was a son of George W. Ross of the Knoxville Marble Company and whose pedigree can be traced back to one of the first commercial quarry operations in Knoxville, seems also to have been affiliated with Ross-Republic.[209]

The final decades of the nineteenth century began a period of tremendous growth for the Tennessee marble industry. Historian John Stilgoe has written: "in the half century following 1880, the railroad industry reshaped the American environment and reoriented American thinking."[210] By the late 1860s, locomotives had resumed pulling heavy cargo from East Tennessee to be transported over water to distant markets by the late 1860s. In February 1868, a notice in the *Milwaukee Daily Sentinel* reported that the East Tennessee marble quarries were resuming operation, but without specifying which quarries or where they were in East Tennessee.[211] Later that same year a commercial listing for the schooner Myrover in Charleston harbor included twenty-one tons of Tennessee marble headed for the port of New York; the following year the same publication listed twenty-two tons of

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[209]John M. Ross was one of the heirs of George W. Ross, co-owner of the Knoxville Marble Company with William Patrick. In 1873 Ross and Patrick took over the quarry that had been used for the Knoxville Customs House construction in 1871-72, began powering it with steam saw blades and derricks, and used their proximity to the river and railroad spur lines to send marble to St. Louis for its Customs House and to Albany for the New York State Capitol building. McAdams, *Marble Halls* (Knoxville: self-published), 4-5.

[210] Stilgoe, ix.

[211] *Milwaukee Daily Sentinel* 1 February 1868.

Tennessee marble headed for Philadelphia, also by schooner.[212] An anonymous "Account Book: 1886-87" from Rogersville, Tennessee documented hauling by Frank Netherland, an entrepreneur known to have specialized in heavy loads using teams of mules.[213] It also detailed the shipment of blocks of marble to customers in Knoxville, Baltimore, Boston, Buffalo, New York, Milwaukee, Chicago, St. Louis, and Lexington. It is interesting to note that the most frequent customer in the ledger book is W.H. Evans & Son, for shipments to both Knoxville and Baltimore.[214]

The 1894 consolidation of railroads to form more efficient transportation networks also allowed competition among routes, further encouraging the market for Tennessee marble. Historian Connie L. Lester contends that complaints about rates and business practices from railroad customers, such as farmers, during the early decades of expansion, prompted the formation of state railroad commissions designed to temper "the often ruthless and impersonal nature of business in an era of industrial building and merger." At the same time, cities and towns eager for

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[212] *The Charleston Courier, Tri-Weekly* 7 November 1868, 1 May 1869.

[213] Two other African Americans, John Wells and Reeves Kyle, along with Sam Goodman, used teams of from eight to thirty-two mules or oxen to haul marble to the railroad. Price, *Hawkins County, Tennessee: A Pictorial History*, 164.

[214] University of Tennessee, Special Collections, "Account Book, 1886-1887," MS 1404.

growth often contradicted the reform impulse by granting tax breaks and other public advantages to make certain that the railroad would reach them.[215]

The post-war federal building boom, an enormous outlay of government largesse, brought new customs houses, post offices, and federal court houses to many cities across the country and proved a boon to the building trades. Beginning as they did in the Reconstruction Era, the erection of these often massive, usually stone, structures must have been intended to impress citizens with the long reach of the federal government. They also provided jobs and materials contracts. Historian Steve Cotham believes there was a reason that the first of these to be built in Tennessee went to Knoxville: the dimension marble, Italianate-revival block that houses the East Tennessee History Center today (figure 17) was intended as a reward to a loyal city and section of the state.[216] A decade or more elapsed before similar multi-purpose custom house/court house/post office buildings, designed by Mullett's successor, William Appleton Potter, were erected in Nashville (1882) and Memphis (1885).

As they had in the past, these massive federal building projects sometimes inspired political investigations into the suitability and choice of architectural

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[215] Connie L. Lester, *Up From the Mudsills of Hell: The Farmer's Alliance, Populism, and Progressive Agriculture in Tennessee, 1870-1915* (Athens: University of Georgia Press, 2006), 42.

[216] Steve Cotham is Director, McClung Historical Collection, Knox County Public Library, and Historian, East Tennessee Historical Society.

materials.[217] Style, however, seems not to have been an issue since the supervising architect of the Treasury created and distributed the plans, resulting in recognizable types of buildings that populated the country with a commanding sameness.[218]

The result was a stamp of government power in architectural form, repeated ad infinitum. But the decentralized location of these buildings suggested a new, perhaps at first unspoken, mandate in addition to the requisite qualities of permanence and impressive appearance: the use of local materials. What marked these buildings as belonging to place was the choice of materials. A. B. Mullett said of the marble he had used in Knoxville, "It is, in my opinion, unsurpassed in beauty and

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[217] The Knoxville Marble Company's William Patrick, who stated that he was a resident of St. Louis, granted an interview to the *St. Louis Globe Democrat* about his company's unsuccessful attempt to secure a contract for tombstones for the federal cemeteries. His complaint alleged that his company, the low bidder, was disqualified because the original specifications were changed in ways that actually lowered the cost for the company that did receive the bid. Although the Knoxville Marble company did not succeed in getting the contract, the incident was one of a number of charges that finally resulted in Secretary of War William W. Belknap's resignation. *St. Louis Globe Democrat* 7 March 1876.

[218] According to National Park Service historian, Charles W. Snell, Alfred P. Mullett, who served throughout Grant's two terms in office, employed three design styles during his tenure as Supervising Architect of the Treasury: the smallest group, "Greek or Classic Revival" (1869-75) included the north wing of the treasury building in Washington, D.C., as well as the U.S. Mint in San Francisco and Post Office/Court House/Custom House buildings for Portland Maine and Portland Oregon. The second, "Italianate" (1866-78) was chosen for many combination custom house/court house/post office buildings dispersed across the country from Maine to Michigan to Minnesota to South Carolina and Tennessee. It also included assay offices in Idaho and Montana. The third and largest group, "Second Empire" (1867-1885) included the monumental State, War, and Navy building in Washington, D.C., and huge Post Office/Court House/Custom House buildings in Boston, New York, St. Louis, Cincinnati, and Philadelphia. National Register Nomination, *Old Court House [United States Customs House and Post Office], St. Louis, MO*, entered 17 February 1970.

desirability by any marble now in use in this country."[219] With such a stamp of approval, Tennessee marble, long desirable as an interior stone, began also to be considered for exterior use.

The rise of corporate wealth brought a demand for materials for manufacturing and building, as well as business opportunities, to the post-war South. The large industrialists who orchestrated much of the country's growth during this period exhibited their status and power first by building luxurious residences, and then by establishing and endowing public institutions such as libraries and museums. The creation of these new public entities arose hand in hand with the rebirth of the classical style in architecture made popular by the "American Renaissance" buildings at the 1893 World's Columbian Exposition. Many of the important public buildings constructed from the 1890s to the 1920s along the new "metropolitan corridor" would call for status building materials.

As poet Ralph Waldo Emerson had predicted back in the 1840s, "railroad iron [would prove to be] a magician's rod" in tapping into the country's resources.[220] With the Southern Railway's extensive network fully in place and the long line north-south capabilities of the L&N Railroad moving into a competitive position in

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[219] William Patrick presented this letter from Mullett to War Department Secretary W.W. Belknap in his unsuccessful attempt to secure a contract for tombstones for the federal cemeteries. *St. Louis Globe Democrat* 7 March 1876.

[220] Ibid.

the early 1900s, East Tennessee marble became one of the nation's most highly sought after building materials.[221]

[221] Most of the small local lines in Tennessee had merged into one of three national competitors: The Southern Railway controlled by J.P. Morgan, the Louisville & Nashville, to which V.K. Stevenson had secretively sold the Nashville & Chattanooga in 1880, and the Illinois Central. Lester, 42-43.

CHAPTER V

THE METROPOLITAN CORRIDOR EXTENDED: TENNESSEE MARBLE AND AMERICAN COSMOPOLITANISM

In the last decades of the nineteenth century, Tennessee marble took on a greater national role as a prestige building material. New long-line railroad networks being assembled to the north and west provided access to new markets for Tennessee marble. As the nation's wealth grew through government expansion and corporate enterprise, private and public buildings reflected the new largesse, in part, by using Tennessee marble in these landmark structures. The use of the marble added a touch of elegance that served to elevate the reputations of new urban centers along the nation's metropolitan corridor. Many of these solidly-constructed buildings still survive, an enduring legacy of a period of American expansionism and the establishment of corporate wealth, both of which continue to shape this nation today.

After the Civil War, the long-standing transportation alliance between Tennessee and South Carolina waned. The South Carolina State House project had come to a halt. The walls of the unfinished building withstood assault by federal troops during the occupation of Columbia, but many of the native granite Corinthian column capitals for the exterior porticoes were destroyed, as was the railroad track

on which granite was hauled from the quarry. Only five of sixty-five Italian marble capitals intended for the great hall remained; the monolithic polished Tennessee marble column shafts furnished by Dougherty and Sisson were ruined.[1] Unable or unwilling to authorize continued construction on the building, the South Carolina legislature allowed architect John Niernsee and his family to return to Baltimore.[2]

Yet, even if South Carolina officials had wanted to replace the lost Tennessee marble, it may no longer have been possible to obtain a large quantity of single-shaft columns from those same quarries. In early 1869, sculptor Clark Mills, at work on a seventy-foot monument to Lincoln—a sculptural grouping of thirty-seven bronze portrait sculptures and six horses—announced that the monument would of necessity be created in granite, since the Tennessee marble used in the U.S. Capitol had become scarce and expensive.[3] But the famous sculptor's reference to the marble in the Capitol suggests that he may only have been familiar with the Hawkins County marble.

If the more plentiful Knox County marble was not yet widely marketed to knowledgeable customers on the eastern seaboard, that was soon to change. A 31 October 1868 newspaper story in the *Knoxville Herald* quoted a contributor to the *Richmond Whig* as remarking that Knoxville was "perhaps the widest awake … town

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[1] *The Daily South Carolinian* (Columbia) 15 August 1866.

[2] Bryan, *Creating the South Carolina State House*, 73-74.

[3] *The Charleston Courier, Tri-Weekly* 9 February 1869; *Daily National Intelligencer* 15 February 1869.

of its population, not only in Tennessee, but in the Southern States" and that the railroads were the guarantee of its viability.[4] After the union of the East Tennessee & Georgia and East Tennessee & Virginia Railroads in 1869, a Philadelphia newspaper noted that shipments of Tennessee marble were beginning to pass through Lynchburg, Virginia, by rail.[5] Historian William J. MacArthur, Jr. has attributed the momentous post-war growth of Knoxville to "Knoxville capitalists join[ing] with entrepreneurs from afar to develop mines, quarries, and logging operations," arguing: "the railroad also promoted the exploitation of the natural resources in rural areas."[6] No doubt, some of the resource owners also had interests in the railroad. The fact that Tennessee marble had begun to be used, in federal custom houses, railroad terminals, and other prominent public buildings, in cities served by the railroad network that connected East Tennessee to the East, Mid-west, and West beginning as early as the 1870s, is a testament to Knoxville's entrepreneurial capitalists. An excerpt of an 1856 article from the St. Louis *Republican*, reprinted in a Knoxville newspaper, reveals that before the Civil War,

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[4]William J. MacArthur, Jr., *Knoxville's History: An Interpretation* (Knoxville: East Tennessee Historical Society, 1978, reprinted from *Heart of the Valley: A History of Knoxville, Tennessee*), 30-31.

[5] *North American and United States Gazette* 17 April 1869.

[6] MacArthur, *Knoxville's History: An Interpretation,* 30.

Knoxvillians well aware of the marble's potential had recognized the newly-opened railroads as the key to market expansion into the Mid-west.[7]

A generation later, in 1887, a visiting party from *Harper's Weekly* reported thriving industries in many sectors, citing the presence of "Northern and Western men, attracted by the manifold advantages offered in Knoxville, [who] had established themselves here soon after the war [and] in many cases formed partnerships with Southern men." Harper's writer Kirk Monroe found the marble industry particularly fascinating. He devoted two long paragraphs (out of eleven) to a description of the wealth of marble to be found and opined that this promising sector could expand exponentially as the marble began to be processed locally instead of shipped north to be worked.[8]

The evolving national railroad corridor dated to at least 1850, when Congress supported railroad building from south to north by granting a two-hundred-foot right-of-way through Mississippi, Alabama, and Illinois, along with alternating parcels of land that could be sold for development purposes. This federal subsidy helped to create the Illinois Central, with backers in New York and Chicago, which by the late 1850s was one of the largest lines in the country, controlling a

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[7] The newspaper writer, sounding like a marble enthusiast him(her)self, stated: "We have several times spoken of the abundance and fineness of our Tennessee Marble. The annexed extract, from the St. Louis *Republican*, shows, to some extent, the estimate set upon it abroad." However, the story was recounting a visit by a Knoxvillian who had carried marble specimens to St. Louis, not an inquiry coming from that direction. *Knoxville Register* 12 April 1856.

[8] Kirk Monroe, "The Industrial South: Knoxville, Tennessee," *Harper's Weekly* 7 (May 1887, XXXI, no. 1585): 330.

corridor from New Orleans through Mississippi and Tennessee to the Ohio River.[9] After the war, even though railroad building and rebuilding were immediate priorities in the Southern states, with Southern state treasuries depleted, little or no support from the federal government, and few individual investors, these projects remained underfunded. Some state governments and southern-backed companies cautiously allowed outside investment but still attempted to retain control over the lines.[10] In the 1870s railroad men like Thomas A. Scott, of the Pennsylvania Railroad, began to buy some of the failing southern lines and consolidate existing roads into the kind of powerful network needed to revive the Southern economy. The business acumen of his secretary, Andrew Carnegie, proved instrumental in creating a profitable system for freight shipments.[11] With the economic crisis of 1873, however, a number of lines did not survive; even Scott's powerful syndicate, the

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[9] Mark W. Summers, *Railroads, Reconstruction, and the Gospel of Prosperity: Aid under the Radical Republicans, 1865-1877* (Princeton, NJ: Princeton University Press, 1984), 176-177; Kevin and Laurie Collier Hillstrom, eds. *Industrial Revolution in America: Railroads* (Santa Barbara: ABC-CLIO, 2005), 11-12.

[10] Summers, 278-279. Kevin Hillstrom has suggested that some of the railroad builders were more interested in being paid by the Southern states for the work of rebuilding their ruined lines than they were in creating a modern network. Hillstrom, 15.

[11] In a full-scale study of Carnegie and his philanthropic library program, historian Abigail Van Slyck claims that he invented cost accounting in order to gauge profit margins, using it first in railroad endeavors and then in his steel company. Abigail Van Slyck, *Free to All: Carnegie Libraries and American Culture, 1890-1920* (Chicago: University of Chicago Press, 1995), 9. Hillstrom attributes the use of a cost-accounting system for railroads to Albert Fink of the Louisville & Nashville, and proposes that Carnegie's innovation was to adapt it to the steel industry. Hillstrom, 48.

Southern Railway Security Company, had to trim its holdings. But, for a period, it had helped sustain the newly integrated East Tennessee & Georgia and East Tennessee & Virginia (ETV&G) and the mainstay Richmond and Danville railroads, as well as feeder lines serving North Carolina and Georgia as far south as Atlanta.[12]

Over the next two decades, the fortunes of the Southern Railway Security Company's railroads waxed and waned. Most of the survivors were consolidated into Drexel Morgan and Company's Southern Railway System in 1894. One of the partners in that firm was John Pierpont Morgan, the New York-based financier who had played a critical role in refinancing the federal government's Civil War debt.[13] His father, Junius, had worked with investor George Peabody in London during the initial phase of railroad development of the 1850s. The elder Morgan's expertise, combined with private banking house connections, the financial acumen of the younger Morgan, and the business savvy of Anthony Drexel, his partner in Philadelphia, led the firm to undertake the refinancing of many railroad lines during the 1870s and 1880s.[14] When the railroad building boom collapsed, as the United States faced another economic crisis in 1893, Morgan actually restructured a number of the failing railroads to create more efficient operations and ensure future

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[12] Summers, 277.

[13] Hillstrom, 73.

[14] Vincent P. Carosso, *The Morgans: Private International Bankers, 1854-1913* (Cambridge: Harvard University Press, 1987), 144-145, 222-224, 247.

profitability.[15] "Morganization," as it came to be known, saved major lines like the Philadelphia and Reading, the Chesapeake and Ohio, the Erie, the Lehigh Valley, and the Norfolk and Western. In the South it involved combining a large number of smaller lines into one large system: the Southern Railway.[16]

The Southern Railway System, which included the East Tennessee Virginia & Georgia Railroad and the Richmond & Danville roads, would become one of the mainstays of Tennessee marble transport.[17] The ET&GA and ET&VA railroad lines had had side-by-side depot buildings in Knoxville by the time of the Civil War, which gave the Southern system an edge with local firms and those that opened in the

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[15] Carosso, 363, 369. Historian Alan Trachtenberg has characterized the 1893 financial panic as the worst in the country's history. Alan Trachtenberg, *The Incorporation of America: Culture and Society in the Gilded Age* (New York: Hill and Wang, 1982), 211. During the last decades of the century, many American manufacturing companies, unable to survive price-cutting competition, were bought up or merged into larger firms. This happened particularly in businesses that demanded a lot of capital and had high fixed costs. Such "horizontal" expansion, when complemented by market-grabbing vertical integration, which Alfred D. Chandler, Jr. defined as the joining of raw material sourcing to production and distribution, resulted in the rise of notable mega-fortunes. Carnegie Steel, by the 1890s one of the major producers of railroad iron, not only absorbed rival companies, it controlled both raw materials and transportation. This company, whose sale made Andrew Carnegie one of the wealthiest men in the world, formed the basis for J.P. Morgan's U.S. Steel Corporation in 1901. Canadian entrepreneur James Jerome Hill, a railroad impresario who also owned vast amounts of land containing iron ore, made sure that the sale of those lands to U.S. Steel in 1906 included a guarantee that the ore would travel on his Great Northern lines at a higher than normal tariff. Naomi R. Lamoureaux, *The Great Merger Movement in American Business, 1895-1904* (New York: Cambridge University Press, 1985), 8, 87, 99, 146.

[16] Hillstrom, 74.

[17] Carosso, 369.

decades immediately following the war.[18] In the 1880s, most of the marble freight leaving East Tennessee appears to have been moving on these lines, a great deal of it being loaded from river to rail at Concord, where at least ten companies were in operation by 1885. Some of the Knoxville companies near the Forks of the River were also floating marble downriver for shipment.[19] By the turn of the century,

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[18]In 1859, *Williams' Knoxville Directory* listed the address of the Knoxville Steam Mill (Robert J. McKinney, President; R. Craighead, Secretary; and Thos. J. Lyon, John J. Craig, A.A. Barnes, Proprietors) as "north of the ET&GA Railroad." It is the only plain "mill" listed, which implies that it might have been used for multiple purposes. The only "marble dealers" in the directory are George W. Fagan & Bro (the Fagan name continues to appear in city business directories until at least 1884) and the Sligo Mining and Marble Company, with whom James Sloan had a business relationship as early as 1856 (see Chapter IV). A 1856 Knox County property deed mentions the location of the quarry he is purchasing as "near the ET & VA line." Also noted in the Williams directory: V.K. Stevenson of Nashville as a director of the ET&GA Railroad, John J. Craig as Cashier, Union Bank, and Robert H. Armstrong, Thos C. L. Lyon, and A.A. Barnes as Attorneys, the latter two being in partnership. *Williams' Knoxville Directory, City Guide, and Business Mirror I* (Knoxville: Published by C.S. Williams, 1859), 26, 86. Ten years later, *Helms' Knoxville City Directory* also touted the railroads: "the marble quarries in vicinity of the city are now being worked with success and furnish a fine variety of variegated [sic] marble. $60,000 will soon be shipped on one contract to the city of Philadelphia. A car load of rough hewn worth more than a car load of wheat." A particular focus of this directory was the railroads serving the city and nearby environs. The author(s) recorded that the Knoxville & Charleston (16 miles) was completed to Maryville, the Knoxville & Kentucky (31 miles) would soon connect with the Louisville & Knoxville and ultimately have a line to Cincinnati, and the Rogersville & Jefferson (14 miles) was connected to the ET&VA. While R. Craighead is listed as a marble merchant at Henley & Locust Streets, there are no other listings under "marble" and no individual listings for Armstrong, Barnes, Craig, or Lyon, perhaps confirming historical speculation that Armstrong and Craig, at least, had left the city during the war and did not return for some years. *Helms' Knoxville City Directory, 1st Annual* (Knoxville: T. Haws & Co., 1869), 48, 58, 59, 71,115.

[19] A Multiple Properties Nomination (MPS) for the Concord Village Historic District, NHR listed 1987, names five companies, the Lima & East Tennessee, Stamps Wood & Company, Stewart Marble, Republic Marble, and the Juanito marble mill, as operating in the area by 1883. *Goodspeeds'* noted the following Concord marble firms in

however, the Southern had a powerful competitor for marble cargo shipping out of the Knoxville area: the Louisville and Nashville (L&N).[20]

While the Southern Railway ultimately took over the Knoxville & Charleston line, which had been completed to Maryville by 1868 and combined with the Knoxville & Augusta in 1881, it was the Knoxville Southern that would assure the L&N a stake in the Tennessee marble industry. Their tracks crossed the downtown bridge across the Tennessee River, passing through Louisville, Tennessee, near a line of rich Blount County quarries just beginning to be opened in the late 1880s, connecting to the Marietta and North Georgia Railroad in 1890. The L&N would also

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1884-1885, when information for that publication was being collected: Godfrey Brown & Company, Red Triangle Quarry, Juniata Marble Company (probable variant in NHR listing), Cedar Bluff Marble Manufacturing & Railway Company, Great Bend Marble Company, Kinkaid & Company. By the end of the century, at least twenty-three Knoxville companies had come on line. A list of marble entities, other than individuals, compiled from Knox County property deeds, 1859-1901 city directories, *Goodspeeds'* (1887), and *Rule's* (1900) includes: Sligo Mining and Marble (1854), Dickeson Marble Mining & Manufacturing (1856), Knoxville Mining & Marble (1869), Knoxville Marble Company (1871), Fagan & Bro. (1876), Beach & Company (1880), Tennessee River Marble (1880), Bean & Bro (1881), Knoxville Marble Works (1881), John J. Craig & Company (1881), Crescent Marble Company (1884), Morgan & Williams (1884), Phoenix Marble Company (1885), Great Southern Marble (1889), Tennessee Producers Marble (1889), Gray Knox Marble (1891), Great Bend Marble (1891), T.S. Godfrey Marble (1896), Ross Republic Marble (1900), Concord Marble Company (1901), East Tennessee Marble Company (1901), U.S. Marble Company (1901), Gray Eagle Marble Company (1902).

[20] One of the leading marble entities in the United States, the Baltimore-based Evans marble company, which had located a satellite operation in Hawkins County by 1880, and later opened a mill in Knox County, was shipping freight out of Knoxville on the Knoxville & Ohio Railroad, which later became part of the L&N, by 1888. Norris Wellge & Co. *Knoxville, Tennessee, County Seat of Knox County* (Milwaukee: Beck and Pauli Lithography, 1888).

make inroads into Knoxville from the north, building an impressive stone passenger terminal in 1904 to announce its challenge to the Southern Railway. The L&N would become the primary carrier for the operations of the John J. Craig Company and affiliates in Blount County, which would allow the firm to vie for industry dominance by the 1910s. A map created to show how the routes served the industry (figure 17) does not distinguish between the two lines. The long straight east-west line that served the Knoxville quarries is the ETV&G (Southern).

Figure 17. This GIS-generated overlay map uses USGS quads stitched together as an underlying map, with green county boundaries, and the National Transportation Atlas for railroad lines in red. The locations of marble quarries in bright green dots were derived from Gordon's 1924 geological maps (figures 10 & 11). At top right is Knoxville and vicinity, at left is the Friendsville area of Blount County. Map created by author with assistance from Tom Nolan and Zada Law, MTSU Geosciences GIS lab.

While it is easy to see that the railroad lines in the Knoxville area served the marble quarries, the lack of same in Blount County is due to the fact that the railroad lines

have been relocated approximately five miles south. A modern roadbed can be found where the lines once lay.

The L&N, which had opened a route between Nashville, Tennessee, and Louisville, Kentucky, in 1859, made a profit during the Civil War by serving both sides—running through neutral Kentucky to keep supplies and soldiers moving.[21] It outlasted most of its competitors to emerge as one of the few original Southern lines to remain intact.[22] Soon after the war, the Nashville & Chattanooga had made a valiant but ultimately unsuccessful bid to challenge the L&N for access west and north. Signaling its intent to reach mid-western centers of commerce by changing its name to the Nashville Chattanooga & St. Louis, the line had begun its march toward St. Louis by absorbing the Nashville & Northwestern in 1872-3.[23] In 1880, the year after the NC&StL had acquired a route into East St. Louis, former N&C president Vernon K. Stevenson and one majority stockholder sold out to the L&N, surprising railroad President Edmund Cole and ultimately leading his New York shareholders to do the same.[24] The newly enlarged L&N network rivaled the Illinois Central as

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[21] John F. Stover, *The Railroads of the South, 1865-1900: A Study in Finance and Control* (Chapel Hill: University of North Carolina Press, 1955), 210-211.

[22] Business historian Albro Martin has described the L&N as "conservative and well-run" during a period when many eager to expand but under-capitalized railroads failed, particularly some of the state-run roads in the South. Albro Martin, *Railroads Triumphant: The Growth, Rejection and Rebirth of a Vital American Force* (New York: Oxford University Press, 1992), 30.

[23] Johnson, "Railroads," *Tennessee Encyclopedia of History and Culture*, 771.

[24] Gamble, "Nashville and Chattanooga Railroad," *Tennessee Encyclopedia of History and Culture*, 768; Stover, *Railroads of the South,* 223-226.

the primary carrier from Tennessee to Chicago, which had supplanted St. Louis as a transportation hub during the war and was destined to become the railroad gateway to the west.[25]

In the immediate post-war period, the L&N's main challengers for the riches of East Tennessee were the upriver city of Cincinnati, the Knoxville and Kentucky Railroad, and the combined ETV&G lines. Knoxville investors had initiated the Knoxville and Kentucky Railroad in 1854 in order to access the coalfields in the counties north and west of Knoxville and carry freight to the Ohio River.[26] In place as far as Clinton, Tennessee, by the beginning of the war, it was used in September 1863 and thereafter by federal troops moving down into Tennessee. This line, which was re-chartered as the Knoxville & Ohio in 1869 and later linked to the L&N system, had an immediate competitor in the Cincinnati Southern.

Funding for the Cincinnati Southern had come directly from the city of Cincinnati, which sought to connect through Chattanooga to the resources and rail network of the southeastern states. Access through Kentucky had been blocked by that state's General Assembly until 1872, after which the line was quickly completed. An 1872 map "Showing the Position of Chattanooga and Its Rail Road

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[25] Ross Miller, "Chicago's Secular Apocalypse: The Great Fire and the Emergence of the Democratic Hero" in: *Chicago Architecture, 1872-1922: Birth of a Metropolis* (Munich: Prestal-Verlag for the Art Institute of Chicago, 1987), 28.

[26] MacArthur, *Knoxville's History: An Interpretation,* 22. Among the directors of this line, in addition to President Joseph A. Mabry, Secretary John L. Moses, and Consulting Engineer C.S. Williams, was O.P. Temple. *Williams' Knoxville Directory,* 26. This volume, which contains detailed information about the railroads serving Knoxville just prior to the Civil War, appears to have been published by railroad man C.S. Williams.

Connections" showed the planned link from Cincinnati to Chattanooga under construction.

The race was clearly on for a cross-country connection; this map shows St. Louis, rather than Chicago, as the most direct link to points west, and Knoxville is not shown at all. Given the fact that a bridge from Council Bluffs, Iowa, to Omaha, Nebraska would open in 1873 to create a direct cross-country route from Chicago to San Francisco, over the tracks of the Union Pacific, and that the Eads Bridge at St. Louis would not be completed until 1874, the map was a bit optimistic.

A very interesting companion map: "Country Surrounding Chattanooga, Tenn. Showing the Facilities for Transportation and Mineral Resources" indicated locations of limestone, red, brown, and hematite fossil ores, coal, copper, and gold. Even though Knoxville was included as one of a number of cities on this map, along with the ETV&G heading north and east directly through the marble areas, not one marble area was noted.[27] Railroad boosterism had apparently taken on a separatist tone. Chattanooga, enjoying enormous growth in the post-war period due largely to

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[27] Tennessee State Library and Archives, Library Collection, three maps, all published by Tavel, Eastman & Howell, bound in book: S115.A28 1872/74. A later corollary to the Chattanooga-centric view is an 1890 promotional publication of the Louisville and Nashville Railroad Company, issued for the "Land and Emigrant Department" by agent W.M. Janes, which included a mineral map of Tennessee accompanied by a description written by state agriculture commissioner J.B. Killebrew. The map showed eastern and western iron belts, a wide swath of coal measures along the Cumberland Plateau, numerous locations of marble and lead along the Appalachian chain, as well as other pockets of minerals, including several locations of marble near rivers in southern middle Tennessee and just west of the Highland Rim, potter's clay generally across west Tennessee, and slate, gold, and copper in the southeastern section of the state. Tennessee State Library and Archives, J.B.Killebrew Papers.

the development of the iron and steel industry, was vying with Knoxville and Nashville for prominence as a rail center gateway to Atlanta and the Deep South.[28]

While the South was left to recover its economic momentum and develop its resources through outside investors, the development of American railroads in the Mid-west and West was bolstered by massive public land grants, such as those given to the Union Pacific, Northern Pacific, and Great Northern Railroads. Government support had shifted west to spur the completion of cross-country lines; the expansion of railroad-owned properties far and away outpaced what had gone before.[29] Although Memphis and St. Louis recovered much of their former importance in the Mississippi River trade, there would be no cross-country railroad traffic through Saint Louis until the completion of the Eads Bridge. The war had cost Memphis and the South its advantage in competing for a Southern cross-country rail corridor—once a pet project of former U.S. Secretary of War Jefferson Davis.

Across the northern section of the Mid-west, however, these were boom times for anyone with money to invest. Once the "golden spike," uniting the Union Pacific and Central Pacific railroads, had been driven at Promontory Point, Utah, in 1869, and the Union Pacific and Burlington lines joined upon the opening of the Union Pacific's Missouri River Bridge between Omaha, Nebraska and Council Bluffs,

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[28] In the immediate post-war period Chattanooga was targeted by Cincinnati as a destination that would enable the city to compete against rival Louisville for shipment of goods into the Southern states. Chattanooga itself, with its strategic location at the crossroads of multiple rail lines, was also determined to pull ahead of rival Knoxville. Govan and Livingood, 294.

[29] Hillstrom, 16-17.

Iowa in 1873, the nation's long awaited East–West connection was finished. Within a decade of the end of the American Civil War, all four quadrants of the country were linked together, but the advantage had clearly shifted north due to the single crossing in the upper Mid-west.[30]

Geologist Ferdinand V. Hayden's explorations of natural resources along the proposed transcontinental railroad in the 1860s had quickly expanded into a survey of the Wyoming territory and beyond. By 1869, Hayden and a team of more than thirty were traveling the railroad on a government-funded survey of the territories.[31] In 1871, working under the auspices of what would later become the U.S. Geological Survey Hayden produced a voluminous written report, accompanied by the spectacular visual images of photographer William Henry Jackson and

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[30] Clay Lancaster, Introduction to *Waiting for the 5:05: Terminal, Station and Depot in America,* by Lawrence Grow (New York: Main Street Press, 1977), 9. In *Railroads Triumphant*, Chapters 8-11, Albro Martin chronicled the network of business associations that were formed between powerful railroad and financial entities in order to make this happen. As it became possible to move large volumes of agricultural products at much lower cost than previously, railroad owners realized the power of the long-lines to create new markets. Once Carnegie Steel introduced Bessemer steel rails, heavier cargo loads could be hauled; many, such as Canadian entrepreneur James Jerome Hill, also became involved in the development of resources. Martin, *Railroads Triumphant*, 195-200, 292.

[31] Hayden, a University of Pennsylvania minerologist, was initially fascinated by the fossil remains of the Montana territory, which he first explored in the 1850s. Charles A. White, *Memoir of Ferdinand Vandiveer Hayden, 1839-1887* (Washington, DC: National Academy of Sciences, 1894 www.nap.edu/html/biomems/fhayden.pdf [accessed 16 February 2011]

painter Thomas Moran.[32] The *Helena Daily Herald* reported at the time that the expedition was also connected to the Northern Pacific Railroad, already pushing forward to its 1883 completion. The Northern Pacific's agents at Jay Cooke & Company not only subsidized Moran's journey, they may even have been instrumental in facilitating the formal correspondence between Hayden and local officials who favored the creation of a national park in the area.[33] As entrepreneurs followed in the footsteps of government-sponsored expeditions, they spread their wealth along the paths traversed by the railroad network, announcing up-and-coming towns with railroad terminals and erecting homes, banks, and businesses—the finest of which would mean ultimately new markets for luxury building materials like Tennessee marble.

To paraphrase historian Frederick Jackson Turner, by the 1893 World's Columbian Exposition in Chicago, the "frontier" was closed, meaning that the United States government, the railroad ventures, and other American corporate interests had political, commercial, and psychological control of what had once been the vast unknown. The resources and open landscape were no longer available for the taking; they had been traded away, removed under duress from the lands reserved to Native American tribes, or sold for railroad access or corporate exploitation.[34]

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[32] John F. Sears, *Sacred Places: American Tourist Attractions in the Nineteenth Century* (New York: Oxford University Press, 1989), 159.

[33] Ibid., 160-161.

[34] For a microcosm of how quickly the frontier continued to close down as the coming of railroads and minerals exploitation spurred the realignment of northern

The establishment of the first national park, in the Yellowstone Valley, in 1872, which had been suggested to President Ulysses S. Grant by Hayden, had proven to be a stroke of public relations genius.[35] Through their actions in setting aside lands bordering the railroad as corridors of "visible untouched landscape" officials of the federal government, railroad magnates, and corporate executives put to rest qualms that many Americans might have had about the vanishing frontier.[36]

Whereas the celebratory Centennial exposition held in Philadelphia in 1876 was designed to showcase American industry, reawaken the patriotism of the early republic, and promote unity among the recently warring states, the organizers of the Chicago World's Fair were focused outward. Well aware that the future had shifted to a west developing at almost lightning speed, they embraced a cosmopolitan view of the world. In Philadelphia, exhibition displays had stressed one of the persistent themes of the early republic: America's boundless natural resources, many of which were still relatively untapped. It followed in the footsteps of the 1851 Crystal Palace exposition in London. Centered on works of industry, that exposition's subtext had been: industry as the mark of civilization. The United States Centennial celebration

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plains lands see: Carroll Van West, *Capitalism on the Frontier: Billings and the Yellowstone Valley in the Nineteenth Century* (Lincoln: University of Nebraska Press, 1993), 213.

[35] White, *Memoir of Ferdinand Vandiveer Hayden, 1839-1887*, 403.

[36] For example, the Central American Steamship Company put pressure on California Senator John Conness to set Yosemite aside for a public park as early as 1864. Conness argued that the land was worthless for "public purposes" such as mining or agriculture, knowing full well that the free park would benefit the railroads. Sears, 129-130.

included international displays, and the public had delighted in these touches of exotica, but the focus had clearly been on American resources and ingenuity.[37] In immediate post-Civil War America, with the re-unified economy aimed at balancing the growth of manufacturing and raw materials for a national market, the extension of trade for American goods abroad was a dream of the future.

Less than two decades later, the motto of the World's Columbian Exposition was a "summation of human progress," but the subtext was clearly global competition.[38] Fair organizers in Chicago, cognizant of their city's status as a commercial gateway, had aspirations to world trade. While they planned to celebrate American history and the rapid rise of science and industry, their claims to empire can be seen in the purposely-designed connections with past civilizations that had risen to greatness through science, industry, and democracy. These promoters of America's westward expansion and industrial progress turned to

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[37]The first department of the National Museum (later the Smithsonian Institution) organized was a display of building stones curated by Dr. George W. Hawes. Hawes, working "under authority" of the Census bureau, undertook scientific analyses of the American stones so that he could recommend which were most appropriate for use in which parts of the country. "Most of these, as already generally known, are Centennial exhibits presented to the Government by various private individuals, both foreign and American. These were consigned by the Government to the care of the Smithsonian Institution, but as no room could be afforded for properly displaying them in that building, Congress, in March 1879, appropriated money for the erection of the new Museum edifice, which was begun in that year, and has pushed forward with remarkable rapidity." "The Science of Stones: Interesting Exhibits and Experiments at the Museum," *The Washington Post* 30 April 1881.

[38] Ingrid A. Steffensen-Bruce, *Marble Palaces, Temples of Art: Art Museums, Architecture, and American Culture, 1890-1930* (Lewisburg, PA: Bucknell University Press, 1998), 29.

architecture and art to project an appropriate image of confidence. To set the idea in the public imagination, the main buildings of the fair emulated architectural and artistic designs from Roman art and architecture, which carried allusions to the glories of Greece. The classical references, were, for the most part, reflected through Italian Renaissance interpretation. The architects who designed these buildings crafted an "American Renaissance" style that would become the primary mode of expression for civic buildings over the next several decades. After visiting the Chicago fair, writer and social critic Henry Adams remarked that its artists and architects would be remembered long after the millionaires and politicians who instigated it.[39]

Architectural historian Stanley Appelbaum has posited that the impetus for the Chicago exposition came from the enormous acclaim given the Paris fair of 1889. The World's Columbian Exposition footprint was certainly daunting in scale, its acreage purposely exceeding that of the Éxposition Universelle.[40] Historian Daniel Bluestone has further suggested that the "City Beautiful" concept exemplified by the Chicago fair was also a physical means of instilling in the citizenry a sense of inclusion in the country's progress.[41] The exposition created a public space that had

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[39] Michael Botwinick, Foreword to *The American Renaissance 1876-1917* (New York: The Brooklyn Museum, 1979), 7.

[40] Stanley Appelbaum*, The Chicago World's Fair of 1893: A Photographic Record* (New York: Dover, 1980), 2.

[41] Daniel Bluestone, "'A City Under One Roof,' Chicago Skyscrapers, 1880-1895," in *American Architectural History: A Contemporary Reader,* Eggener, Keith L., ed. (London and New York: Routledge, 2004), 199.

been lacking in Chicago since the 1871 fire that had destroyed the city's urban core. The replacement of wood frame buildings with fireproof structures of brick and stone had changed the demographics of the downtown landscape, causing the majority of middle and lower class dwellings and residential buildings to be relegated to the outskirts.[42] Furthermore, the rise of skyscrapers had altered the human scale of the city. The decorative aspects of these otherwise public buildings were reserved for their entrances and lobbies—places entered only by a private audience. Their presence created a new elitism due to the physical separation of business people in their towers and lavish interiors from ordinary citizens in the streets.[43] As a result, many Chicagoans did not feel welcome in the city's new business district.

Historian Robert Rydell has stressed the social impact of such an exposition. He has styled it a "symbolic universe" that presented past, present, and future as a unified whole. In effect, the organizers provided a public stage on which middle class Americans could once again experience participation in civic life and forget for a time the uncertainties of financial depression and labor unrest, while the working class would find a respite from otherwise dreary lives.[44]

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[42] John Brinckerhoff Jackson, *American Space: The Centennial Years, 1865-1876* (New York: W.W. Norton, 1972), 81-82.

[43] Bluestone, 202.

[44] Robert W. Rydell, *All the World's a Fair: Visions of Empire at American International Expositions, 1876-1916* (Chicago: University of Chicago Press, 1984), 2.

The design of a well-planned urban space that would present an impressive and entertaining spectacle of human accomplishment had been a primary goal of Chicago fair organizers. They chose New York landscape architect Frederick Law Olmsted to envision the layout and grounds and Chicago engineer/architects Daniel Burnham and John Wellborn Root to oversee construction of the exposition buildings. What soon came to be called the "White City" was in fact an entirely new city within a city—a sort of generic capital of "empire" in its unified design and cohesive stylistic statement. The plan, inspired by the curving alleés and broad boulevards of Olmsted's urban park designs, would be fulfilled by Burnham's invitation to a number of fashionable East Coast architects, foremost among them the principals of New York's McKim, Mead & White architecture firm, to create buildings reflecting the newly-fashionable influence of the École Nationale Supériore des Beaux-Arts, Paris.[45]

The two schemes cohered into a powerful vision of white buildings around a lake—an ideal city with motifs borrowed from classical architecture and filtered through the Italian Renaissance by way of eighteenth and nineteenth-century Italian, English, and French architecture. Magnificent in scale, the majority of these

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[45] Architectural historian Richard Guy Wilson believes that the firm should be credited as the primary influence on the fair's design and the primary proponents of the City Beautiful movement that followed. He has called Charles McKim the "artistic conscience for Daniel Burnham," arguing that McKim, who traveled to Chicago twenty-three times to consult with Burnham and fair officials and designed the "centerpiece" Agricultural Building, was one of the driving forces reviving classical style in American cities. Richard Guy Wilson, *McKim, Mead & White, Architects* (New York: Rizzoli, 1983), 29-31.

buildings were temporary structures constructed of iron and wood skeletons sheathed in white-painted staff: a mixture of plaster and straw that had been used successfully in Paris in 1889.[46] Since the plaster covering lent itself to intricate carving and modeling and gave the appearance of white marble, the Director of Decoration, Francis D. Millet, used the fair as an opportunity to provide a detailed object lesson in the correct modes of neo-classical building ornamentation.[47]

Rydell has also attributed the rise of an "exhibition culture," which foreshadowed museum and department store displays, to the fairs that took place between 1851 and 1915.[48] Beginning with the Crystal Palace exhibition in London in 1851 and followed closely by the similar fair in New York two years later, displays of prosperity and abundance were part of the message. Hand-in-hand with nationalist aspirations came a push for mass consumption. When coupled with the language of science and demonstrations of technological achievement, the array of consumer goods being produced by corporate enterprise was even more alluring. The act of purchasing became linked to prosperity and progress. It is not surprising that American entrepreneurial capitalists were among the primary backers of expositions. A major supporter of the 1876 Philadelphia fair had been retailer Joseph Wanamaker, and for the 1893 World's Columbian, department store

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[46] Appelbaum, 5.

[47] Ibid., 14.

[48] Robert W. Rydell, *World of Fairs: The Century of Progress Expositions* (Chicago: University of Chicago Press, 1993), 6.

magnate Marshall Field and inventor Cyrus McCormick served on the organizing committee.

Federal support of the fairs not only bolstered nationalist fervor but also provided an opportunity to visibly position government departments as sources of expertise, emphasizing the reach and largesse of the federal government.[49] Framing progress as a combination of enterprise and exploitation of resources, both American expositions (1876 and 1893) sponsored the donation of specimen collections and displays to the National Museum, Smithsonian Institution. The 1893 Chicago fair also sparked the creation of two new museums: The Field Columbian Museum, funded by Marshall Field to house commercial and natural history collections after the fair in the semi-permanent Palace of Fine Arts, and the Philadelphia Commercial Museum, created in concert with the National Export Exposition held in Philadelphia in 1899.[50]

Other permanent evidence of the expositions can be found in such survivals as the Eiffel tower erected for the 1889 Éxposition Universelle and the lasting influence of Beaux-Arts neoclassicism, or "American Renaissance" architecture. Architectural historian Thomas S. Hines has suggested that the pragmatic Burnham continued using Greek, Roman, and Renaissance motifs immediately following the

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[49] Rydell, *All the World's a Fair,* 3.

[50] Ibid., 19, 33.

fair because he lacked a signature style of his own.[51] Yet he had worked in the offices of the leading structural innovator of "Chicago School" skyscraper construction, William LeBaron Jenney, and Burnham & Root had been one of the "school's" most productive firms in the 1880s and early 1890s. While Burnham does seem to have veered away from the Chicago "commercial style" mainstream immediately following the fair, he created several notable skyscrapers, including New York's Fuller (Flatiron) Building, later in his career. His immediate sway towards the neoclassical may have been due to the death of his visionary partner, architectural engineer John Root, or to the fact that the sheer popularity of the styles introduced to Mid-westerners at the fair fostered a demand for similar projects. Architectural historian Carroll L. V. Meeks has argued that, in fact, the turn to neoclassicism was not a great break in architectural fashion after all, since much of what was promoted at the Chicago fair was already familiar to Easterners as variants on the latest from Europe—citing elaborate new public buildings in other European styles that were erected almost concurrently with the Chicago Exposition, such as C. Leopold Eidlitz's New York State Capitol at Albany and John L. Smithmeyer's Library of Congress.[52]

In tracing the evolution of railroad terminals from the mid-nineteenth to mid-twentieth centuries, Meeks praised Burnham for looking forward and

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[51]Thomas S. Hines, *Burnham of Chicago: Architect and Planner,* (1974, repr., New York: Oxford University Press, 1979), 279-281.

[52] The highly decorative interiors of both buildings include Tennessee marble.

backward at the same time, by combining the Renaissance-style with a coherent underlying massing of form in his Union Station for Washington, D.C. (1903-7). Although it was one among several adaptations of the World's Columbian Exposition terminal station designed by Charles Atwood, Burnham's achievement in Washington's Union Station was seen by Meeks as an antecedent of the simple forms of international modernism that would emerge within the next few decades.[53]

After the World's Columbian Exposition, Burnham designed banks and commercial buildings, even some skyscrapers, in a variety of classicizing styles. "White City" building types soon became components of the "City Beautiful" movement, one of whose primary exponents was Burnham. Today Burnham's imprint is primarily recognized in the museums, libraries, and railroad stations that he integrated into park-like settings for turn-of-the-century urban design schemes for Washington, D.C., Manila, St. Louis, and Chicago.[54] Hines has labeled Burnham's work of this period "the architecture of capitalism," encompassing as it does both privately and publicly financed buildings intended for civic consumption.[55] The

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[53] Carroll L.V. Meeks, *The Railroad Station, An Architectural History,* 1956, reprint (Secaucus, New Jersey: Castle Books, 1978), 24, 126-129. Considered from this perspective, Burnham's monumental horizontal terminal block might also be said to have set a precedent for the stripped-down modernism and the rectangular footprint adopted for many 1930s federal buildings.

[54] "Burnham, Daniel Hudson," *Britannica Encyclopedia of American Art* (Chicago: Encyclopedia Britannica Educational Corporation, 1973), 97; Hines, 283-286, 288-289.

[55] In my view, this designation would also apply to much of Burnham & Root's pre-World's Columbian work in Chicago, including the Burnham and Root-designed Richardsonian-influenced "skyscraper" for the Society for Savings (1888-90) in Cleveland. This building, of rough-hewn Michigan red sandstone on a Missouri granite

lavish treatment of building interiors like those of Chicago's First National Bank (1903), a steel and granite building considered so important to the public morale that it was granted a dispensation by city officials so that it could rise to eighteen stories, reflected not only the power of the purse but the cosmopolitanism of the era.[56] One architectural writer described it in almost poetic terms:

> To even the average man on the street not architecturally informed, who has not traveled abroad and lingered in the Italian cities, the exterior of this great building suggests that its interior contains a bank of something more than ordinary extent … the three wide entrances invite one from the side walk … here the grand Italian staircase seems to greet and to invite one to the bank above … the steps, the balustrade, the paneled walls, the coffered ceiling, the great chandelier, the grilles, the design of the marble floor are all in scale and harmony and thoroughly Italian in the best sense, and almost Roman in dignity … White marble was the material in which the designer chose to express himself … with this, the floor contrasts nicely; its inlays of Sienna, Verde antique, Numidian marbles in panels, lozenges, discs, and bands, in the white ground.[57]

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foundation, employed both modern engineering and solid masonry construction. The lavish interior featured polished red columns with gilded capitals, Tiffany-style glass ceiling panels, and (as can be seen in color photographs of the interior) at least four kinds of marble: a lively combination of green and red variegated as a base for the main banking desk, with a pinkish-beige marble field and dark brown variegated trim—both of which could well be Tennessee marble—for the flooring. Museum of Fine Arts, Houston, and Parnassus Foundation, *Money Matters: A Critical Look at Bank Architecture* (New York: McGraw Hill, 1990), 53-54, 118-19.

[56] Hines, 294-297.

[57] "Chicago's Most Massive and Costly Office Building," *The Inland Architect and News Record* XLVI (November 1905) in: Hines, 297. The list of materials here is strikingly similar to the accent marbles used in the interior of Cass Gilbert's Minnesota State Capitol (1904), which included "African Numidian," "French Hauteville," "Breche Violette," and "Old Convent Sienna," as well as "Greek" and "variegated" marbles. Thompson, 59.

Historian Alan Trachtenberg has argued that the "White City" itself should be seen as a model of American social and economic structure—its illusionary qualities serving to smooth over the strident commercialism underneath. Its symbolism was literally true; the white sheathing concealed massive feats of structural engineering made possible by American iron and steel manufacturing. Corporate names such as General Electric, Westinghouse and Krupp were behind many of the Fair's innovations.[58] The overall message of Chicago's 1880s growth had been that an alliance of business and culture could lift society to new prosperity and wisdom. To some, however, the abrupt appearance of tall office buildings had changed the central cityscape in an unsettling manner. Thus, the "softening" of architectural appearance provided by American Renaissance style may well have been strategic. It blunted the rough edges of unbridled materialism and kept the public mesmerized by its association with culture, refinement, and the wisdom of the ages.[59] Henry Adams, after the Chicago Fair, conceded the new reality of American capitalism triumphant.[60] He may well have been one of those for whom the aesthetic appeal of the new order was a comforting factor.

In appearance, American Renaissance buildings not only paid homage to the tradition of marble and stone construction for important public buildings in London and Paris—and to their glistening predecessors in Greece and Rome—they also fit

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[58]Trachtenberg, 215.

[59] Jordy, 80.

[60] Trachtenberg, 219-220.

well into the existing fabric of early buildings in cities such as Washington, Boston, and Philadelphia.[61] As the style of choice for civic architecture in the coming decades, neoclassicism would have a marked impact on the marble industry. The producers of the highest-valued marble in the United States for 1889 were: Vermont, Tennessee, and New York.[62] All had displays at the World's Columbian Exposition.[63] Georgia, whose enormous beds of grey-veined white marble had only

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[61] Just a few years after the Chicago fair, architect Cass Gilbert cited the European and American tradition of erecting public buildings of light colored stone as a justification for his choice of white Georgia marble over Minnesota granite for the Minnesota State Capitol. Neil B. Thompson, *Minnesota's State Capitol: The Art and Politics of a Public Building* (St. Paul: Minnesota Historical Society, 1974), 26-27.

[62] Although Vermont, New York, Maryland, and Georgia produced more volume of marble than Tennessee, according to data taken from the 1889 census, Tennessee ranked second only to Vermont in the value of marble sold. G. P. Merrill, *Stones for Building and Decoration* (New York: John P. Wiley & Sons, 1891), 115.

[63] Under the "building stone" category in Department E: Mines, Mining and Metallurgy, New York had a total of sixty-three listings, most of which were types of limestone or granite and five of which were for marble. Vermont had four listings, three for marble and one for granite. Tennessee had three listings, all designated as marble: J. Oellig Brown showed marble from both Knox and Blount counties, and T.S. Godfrey, Knoxville, had two displays, one of marble and one of Gray-Knox marble. Both men were among the owners of the Great Bend Marble Company, which had some sort of partnership agreement with John J. Craig by 1885. Knox County Public Library, McClung Historical Collection, Craig/Candoro papers. Other states exhibiting marble in this category were: California (one listing), Colorado (one listing), and Missouri (one listing). Another section of Department E included mining and manufacturing concerns. Tennessee was represented by Standard Marble & Stone Company (no city designated) and companies specializing in coal, brick, and iron ore. The list of companies representing marble in this section (which was overwhelmingly dominated by coal, iron, and precious metals) is more extensive, perhaps some of this stone, particularly in the western states, was under prospect and not yet quarried for building stone. Listed by state, the number of companies were: California (1); Colorado (3); Massachusetts (6); Missouri (8); Nevada (3); New York (5); North Carolina (3); Vermont (10); Wyoming (5).

begun to be worked on a large-scale basis after the 1883 arrival of the Marietta & North Georgia Railroad in the town of Tate, did not exhibit at the Exposition, nor did Alabama. The former would soon become one of the top sources of marble for public buildings across the United States, the latter as well, but on a much smaller scale. By 1924, Georgia would rank third in American production, behind first-ranked Tennessee, and second-ranked Vermont.[64] Alabama's white marble, highly valued as a sculptural material because of its pure whiteness and ease of carving, also fit the bill for post-"White City" use, but may have proven unsuitable for exterior construction.[65] Capitol officials had selected Alabama's pure white marble for flooring in the Old House of Representatives (now Statuary Hall) during the United States Capitol Extensions project of the 1850s.[66] American Renaissance architect

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World's Columbian Exposition 1893 Official Catalogue, M.P. Handy, ed. (Chicago: W.B. Conkey & Company, 1893), 24-26, 47, 48, 76, 82, 94, 102, 109, 126, 133, 150.

[64] Dan Hill Latham, Jr. "Georgia Marble: A Study of its Production and Architectural Use Before World War II," M.A. Thesis (Athens: University of Georgia, 1999), 192-195; Case, 72.

[65] A prime example is the exterior of a handsome American Renaissance-style federal post office in Mobile (1914). The fact this is building is no longer extant suggests that the pure white marble may not have been entirely suitable for exterior use, as is sometimes evident in the surface dissolution and stained surfaces of white sacchroidal or "sugar marble" grave makers. Association for Gravestone Studies http://www.gravestonestudies.org [accessed 4 October 2010]; Merrill, 18.

[66]Italian sculptor Giuseppe Moretti, commissioned to create a cast iron sculpture of Vulcan, the Roman God of fire, for the Birmingham iron industry at the 1904 St. Louis World's Fair, moved to Alabama and became involved in several marble business partnerships during the 1910s and 1920s. Ed Dodd, "A Brief History of the Marble Industry in Sylacauga," *Alabama Heritage* XX (1991), 35, 38-39. Alabama marble from

extraordinaire Cass Gilbert would again select it for interior use in the United States Supreme Court building in early 1930s. The large Corinthian columns inside the building, which were milled and carved by Knoxville's Gray-Knox Marble Company, would come from Sylacauga-area quarries. [67]

Even prior to this "Second" Classical Revival, however, the eclectic styles favored by mid-nineteenth century American architects—many of whom had taken British aesthetic philosopher John Ruskin's theories of the supremacy of hand-wrought materials and medieval styles to heart—mandated solid masonry construction, in many cases purposely avoiding the mass-produced materials of the industrial revolution.[68] Ruskin's insistence on integrity of materials also fostered an appreciation for colorful contrasting surfaces.[69] The architecture that followed along these lines grew the market for native stone as well as for unusual, often imported, marbles. One tenet of the École des Beaux-Arts was that certain styles and materials be used for particular building programs: aspiring and airy French Gothic for

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the Moretti-Harrah Company would be used again in the 1920s when the old tile floors of the House corridor were replaced with black and white marble, as specified by Thomas Hastings, Carrère & Hastings, acting architectural consultant. Architect of the Capitol, Capitol Building Records, Correspondence from David Lynn, Architect of the Capitol, to Mr. Walter M. Jackson, Principal, Selma High Schools, 18 March 1935.

[67]Ibid.; Knox County Public Library, McClung Historical Collection, Barksdale Jones, former President, Gray-Knox Marble Company, recorded slide talk.

[68]William H. Jordy, *Progressive and Academic Ideals at the Turn of the Century: American Buildings and Their Architects,* IV (1972, repr., New York: Oxford University Press, 1986), 11.

[69] Meeks, 8.

churches and universities, and sturdy and confident palaces with castellated rooflines for houses, schools, and office buildings. Architects like Richard Morris Hunt, whose patrons William H. Vanderbilt and sons Cornelius Vanderbilt II and William Kissam Vanderbilt were among the earliest Gilded-Age wealthy, created wholesale imitations of French châteaux from limestone, marble, and granite.[70] Stone was so much in demand that, as they had been in the early republic, imitations of the appearance of stone were also used.

Beaux-Arts-educated Henry Hobson Richardson was also an advocate of unusual building materials. In contrast to Hunt, Richardson was a "creative eclectic"—an innovator who borrowed from the accepted architectural vocabulary but used a freer hand in customizing designs for his clients during a brief but brilliant career in the 1870s and 1880s.[71] As his influence spread to the Mid-west, some building projects demanded that the stones be transported from the eastern United States. Instead of the smooth-faced, light-colored ashlar so long favored for public buildings, Richardson and his followers ordered brick, rough-hewn granite, shingles, slate, and a variety of dark-colored sandstones, for civic as well as domestic architecture. Soon after the Civil War, limestone quarries were opened in Southern Illinois, in Ohio, and in Michigan to meet these new demands.[72] During

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[70]This "château" style was not only used in Canada for mansions, but also for Canadian banks, railroad terminals, and grand hotels. It proved so popular that it was adopted by the Canadian Pacific Railroad as a corporate style. *Money Matters*, 65-66.

[71] Meeks, 17.

[72] Jordy, 12.

this period, what is now known as Richardsonian "Romanesque," heavily rusticated, enormous and earthbound arches, Italianate towers, and defined stone courses, began to be widely used for public buildings. The impact of this style can be seen, even after Richardson's death in 1886, in railroad terminals, where it seems to have found long-lasting resonance.[73] With railroad lines making inland transport of heavy cargo possible, cities like St. Paul saw their state's native red sandstone and limestone, along with fancy polished interior stone, used in local buildings, such as Boston-trained Edward Bassford's Richardson-influenced Merchants Bank.[74]

Thus, in the decades following the Civil War, the building fabric itself became a visible symbol of American wealth, enterprise, and ingenuity. Choice and rare

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[73] Indianapolis's Union Station (Thomas Rodd, architect, 1886-89), Union Terminal in St. Louis (Theodore C. Link, Edgar D. Cameron, architects; George H. Pegram, engineer, 1891-94), Louisville's Union Station (H. Wolters, architect, 1882-91), and Chicago's Illinois Central Terminal (1892-93) show similar treatments of architectural elements and construction. Meeks, figs. 135,138, 140; Grow, 74, 79-80, 83. Similar in style, Nashville's Union Station (1900), designed by engineer Richard Monfort from local "Bowling Green" limestone, also reflects Richardson's influence. Lancaster, 16-17; Grow, 76-78. It is interesting to note that Monfort designed a very different style of terminal in 1904 for the L&N station in Knoxville. This substantial brick building has tiled roofs with both pavilion and hipped profiles, rusticated limestone quoins, and a stepped, wall gable dormer. Knoxville's Southern Railway terminal, completed that same year, was designed by architect Frank P. Milburn. Also of brick, it is simplified Gothic-revival style with tall, stepped Dutch gable ends. Carroll Van West, *Tennessee's Historic Landscapes: A Traveler's Guide* (Knoxville: University of Tennessee Press, 1995), 72, 74-75; Edwin P. Alexander, *Down at the Depot: American Railroad Stations from 1831 to 1920* (New York: Bramhall House, 1977), 178.

[74] In addition to rough-hewn red sandstone, this building featured contrasting polished gray granite pillars, and interior pink, possibly Tennessee, marble wainscoting. The young Cass Gilbert worked for a time in Bassford's office. Leonard K. Eaton, *Gateway Cities and Other Essays* (Ames, IA: Iowa State University Press, 1989), 56.

materials became marks of status. Neither Richardson's death, nor the rise of the American Renaissance style for public buildings, which was led primarily by two of his former draftsmen, Charles McKim and Stanford White, lessened the impact of his work in the residential realm. [75] Richardson's influence continued to be felt well into the 1930s, when the Arts and Crafts Movement gained a secure foothold in the imagination of many middle class Americans. The emphasis on materials, interiors featuring exotic patterns and textures, and asymmetrical designs that created private spaces unreadable from the exterior continued to manifest, even in the modest Arts & Crafts cottages and bungalows that attracted many middle class Americans. And there also continued to be a demand among the wealthy for more ambitious, eclectic-revival homes using prestige materials, which often included colorful and unusual interior marbles.

Three examples of Tennessee architectural patronage, all using marble, illustrate the long-lasting impact of Richardson's Beaux-Arts eclecticism. As his marble businesses began to prosper, pioneering Knoxville marble man, John J. Craig, laid the cornerstone for a rustic weekend cottage in 1896. Built from rough-hewn pink marble, "Glen-Craig" was completed in time for a family Thanksgiving in

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[75] Some of Gilbert's earliest commissions in St. Paul were enormous brick, stone, and shingle eclectic-styled "cottages" for wealth citizen. Thomas R. Blanck and Charles Locks, "Launching a Career: Residential and Ecclesiastical Work for the St. Paul Office," in *Cass Gilbert, Life and Work: Architect of the Public Domain*, Barbara J. Christen and Stephen Flanders, eds. (New York: W.W. Norton, 2001), 47, 49-51.

1898.[76] In 1922, architect Hubert T. McGee designed a heavy and rusticated Italian Renaissance palazzo for Clarence Saunders, the Piggly Wiggly grocery-store magnate, in Memphis, Tennessee. The rough-hewn brownish-pink Georgia marble of which the house was constructed soon earned it the nickname Pink Palace.[77] In 1921, the elder Craig's son, John J. Craig II, commissioned a small headquarters building for the Candoro Marble Company partnership. Local architect Charles Barber, a University of Pennsylvania student of Beaux-Arts-trained Paul Cret, created a one-story Italian Renaissance pavilion with adjoining arcade to showcase Candoro's marble products, both local and imported.[78] Craig then commissioned Barber to design his own home. Barber's 1926-28 creation for the Craig family, called "Craiglen," was based on a mid-fourteenth century Florentine town house, the

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[76] Craig family photographs and papers donated by Lucy Cage Kennerly Gump, Knox County Public Library, McClung Historical Collection, Historical Photographs Copying Project.

[77] In addition to the better-known Georgia white marble, there are some veins in northern Georgia that share the same strata as Tennessee's colored stones. In a master's thesis on the Georgia marble industry, Daniel Latham identified one of these as "Etowah," which he describes as a pure calcite marble from Pickens County, Georgia that ranges in color from salmon to deep pink, with greenish black veins and splotches. Latham, 219, 232.

[78] An interesting corollary to the small corporate headquarters in Knoxville, is a 1912 headquarters building for Eastman Gardiner & Co., Lumbermen, in Laurel, Iowa. Built of brick, with a red tile roof, the one-and-one-half story building features a tall three-arched entrance reminiscent of the embedded window arcades of McKim Mead & White's Boston Public Library. The building's interior showcases its original local virgin pine floors as well as floors of "Republic" and "Ross" pink Tennessee marble. Steve Sanders, "Back to Prominence," *Laurel Leader-Call* 21 December 2008 http://www.leadercall.com [accessed 23 December 2008]

Palazzo Davanzati, whose illustrated history, including measured drawings by American artist-etcher Louis Conrad Rosenberg, had been published in 1922. The exterior is stucco, with a red tile roof, and marble steps, patio, and archways of Tennessee pink marble. The interior features carved marble column capitals and family crests, along with custom-made furnishings, all apparently copied from the Davanzati illustrations.[79] It is interesting to note Barber's use of polished Kasota limestone from Minnesota for the entrance hall and curved stairway to the second level.[80]

The success of the World's Columbian Exposition led to a dramatic rise in popularity of Beaux-Arts neoclassicism for public buildings. Gilbert's 1895-1905 Minnesota State Capitol is a fine example of the almost immediate impact of the "White City" on the state and city government architecture. Early in his career, Gilbert worked for two years at the New York firm of McKim, Mead & White, where two of the principals, William Rutherford Mead and Stanford White, like their mentor Henry Hobson Richardson, were École des Beaux-Arts graduates, and the

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[79]Thomas N. McAdams, *Marble Halls: The Story of the Craigs and Candoro Marble Company* (Knoxville: Thomas N. McAdams, 2003), 21, 23, 32.

[80] This same stone had been used by architect Cass Gilbert for a large portion of the interior finishes in his Minnesota State Capitol a decade or two earlier. Its use in St. Paul may have been a political concession to those who criticized the use of white Georgia marble for the building's exterior. Neil B. Thompson has chronicled the controversy over the use of non-native materials (in a state that prided itself on its fine granite) and the subsequent selection of Minnesota limestone for the interior. Thompson, *Minnesota's State Capitol*, 26-29, 58. The presence of the Minnesota limestone in Knoxville suggests that Craig's Candoro Marble Company, a mill and finishing operation formed in 1914 to serve Tennessee marble quarries, not only imported fine marble from Europe but also sourced stone from within the United States.

third, Harvard-educated engineer Charles McKim, had traveled extensively in Europe to see classical and neoclassical monuments first hand.[81] McKim, Mead & White would be the firm most closely associated with the rise of the "American Renaissance" style, which in its fullest manifestation also included symbolic sculptural programs and interior murals.

One of the most important stylistic precedents for public buildings of the next several decades was the firm's 1888-1892 Boston Public Library, with its light-colored granite exterior façade and Italian Renaissance-style arched windows. Such dignified classicizing exteriors, conveniently in visual harmony with the first generation of federal buildings, would soon prevail for civic architecture of all types: museums, libraries, railroad stations—even corporate buildings. McKim, Mead & White's 1896-1904 Rhode Island State House, a neo-classical showcase in white Georgia marble, along with Gilbert's capitol building in St. Paul, set the stage for the next generation of state capitols and city halls.

Loath as he might have been to admit it, Gilbert's domed white marble state house in St. Paul (like McKim, Mead & White's in Providence), in many ways emulated the United States Capitol. The Minnesota building earned Gilbert similar but lesser-scale commissions for state houses in Arkansas (1909-1912) and West Virginia (1921), but the immediate acclaim he received resulted in prestigious

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[81] The McKim, Mead & White firm, best-known today for its neoclassical revival work, was one of the primary successors to Henry Hobson Richardson's legacy. Richardson's lineage also includes the young Cass Gilbert, who had been employed at McKim, Mead & White until 1882, when he moved to St. Paul with their blessing, along with a host of projects for the Northern Pacific Railroad. Blanck and Locks, 46-47.

commissions for the United States Customs House in New York City (1902-1907), a permanent art museum for St. Louis (1901-1904), which was planned as integral part of the 1904 World's Fair, and Carnegie-funded library commissions for St. Louis (1907-12) and Detroit (1921). At the end of his long career, he was still creating buildings in the American Renaissance style, as evidenced by his United States Supreme Court (1935) in Washington, D.C.

In addition to increasing the demand for light-colored granites and marbles for the exteriors of such buildings, the symbolic sculptural programs and dazzling interior finishes that were usually a part of Beaux-Arts projects also demanded specific materials. For the Minnesota capitol, Gilbert enlisted Daniel Chester French, one of the best-known American sculptors of the day, to create a gilded quadriga (horse-drawn chariot group). With his long-time studio assistant Edward C. Potter, a Parisian-trained sculptor who specialized in animals and equestrian statues, French had created the major monumental sculptural groupings for the buildings of the World's Columbian exposition. For the New York Custom House (1900-1907) Gilbert also commissioned French to create monumental exterior sculptural groupings, this time from light pink Tennessee marble.[82] Potter is probably best

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[82]Although French executed these massive compositions in maquette form, then worked them up to half-scale plaster models, the carving was done by master stone carvers, the Piccirilli Brothers, whose names can be found on many of the major sculptural commissions of the period. www.chesterwood.org [accessed 18 January 2010] The Piccirilli Brothers, a father and six sons who had arrived in New York from Italy in 1888, had a studio in the Bronx, at 717 East 142nd Street, by 1905. They must have gotten quite familiar with Tennessee marble as a sculptural material, for they are also known to have carved another pair of Potter lions in the pink marble for J.P. Morgan's library in 1905-6 and a nine-foot tall pink marble vase from a

known today for his carvings of the New York Public Library lions, "Patience" and "Fortitude." These light-colored marble lions, designed by architects John Carrère and Thomas Hastings to flank the 1897-1912 Renaissance-style building's main stair, represent one of several instances in which this team of École des Beaux-Arts graduates chose pink Tennessee marble for decorative complements to their architecture.[83]

For the building's interior, Gilbert commissioned murals by some of the leading mural painters of the day, including Howard Pyle and Edwin Blashfield, and ordered a variety of exotically colored marbles for inlaid patterns in the lobbies and public spaces. His wish to use marble throughout the building was apparently thwarted by Minnesotan demands for economy—and perhaps also state pride. While the largest expanses of interior walls and wainscoting are of polished pink

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design by sculptor Paul Manship for the home of Cleveland industrialist William G. Mather between 1914 and 1916. New York Historical Society, PR042: Morgan Library; Virginia Byrne, "Rare Urn Debuts at NYC's Winter Antiques Show," *Post Journal* (Jamestown, New York) 22 January 2010.

[83] The architects also ordered the marble for a pair of flanking urns for the Fifth Avenue entrance to the home of Henry Clay Frick, now the Frick Collection museum. A recent Frick Collection Conservation Department report posted online cited the firm's original instructions: "1913 specifications by the architects for the stone contractors, William Bradley & Son, stated: 'The vases and the seats marked 'Marble' on the drawings shall be of the Pink Tennessee marble . . . and very fine rubbed finish. Marble shall be from the top layers of the quarries of the Victoria Marble Company, or the New Light Pink Quarry of the Grey Nagle (sic) Company, or the Light Pink Quarry of the Ross & Republic Marble Company.'" www.frick.org/conservation/urns.htm [accessed 8 May 2010] Thomas N. McAdams has identified the source of marble for NYPL lions as the Alexander quarry in Loudon County, which belonged to the Knox Marble and Railway Company. McAdams, 4.

Kasota limestone from Minnesota, Gilbert still managed to use a wide variety of colorful imported and native marbles and other stones as floor inlays and accents.

A host of other architects quickly followed suit, creating neoclassical public and institutional buildings across the United States. This second classical revival was, of course, firmly grounded in an earlier tradition of states seeking to emulate the U.S. Capitol by adopting a classical vocabulary, building in light-colored native stone (or in fireproof building materials that could be made to look like stone) and ornamenting their otherwise plain interiors with decorative stone, terrazzo, or tile.[84] The underlying precedents of the early federal period generally held. During the immediate post-Civil War decades of architectural eclecticism, federal buildings continued to be constructed of similar materials, inside and out, even if not Grecian or Roman in style.[85]

Nonetheless, the scale, scope, and ornamentation of Gilbert's Minnesota

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[84] The North Carolina State Capitol (Ithiel Town and Alexander Jackson Davis, David Paton, 1833-1840); the Ohio State Capitol (Thomas Cole, Ithiel Town and Alexander Jackson Davis, 1838-1861); the Tennessee State Capitol (William Strickland, 1845-1859); and the South Carolina State House (John Niernsee, begun 1854); are examples of the first generation of classical-revival state capitol building. Tennessee marble was chosen for use for the interior finishes of the latter three.

[85] Tennessee marble had been widely praised at the time of its use in the interiors of the United States Capitol. "Views and Scenes at Washington," *New York Evangelist* 24 March 1859; "Sketches of Washington," *New York Observer and Chronicle* 22 January 1863. As an immediate consequence, it was ordered from the Hawkins County quarries for the South Carolina State House and the Ohio State Capitol. As quarries and railroads resumed operation after the Civil War, there was increased demand for the marble for interior use in public buildings. The New York State Capitol, whose Governor's Reception Room had been designed by Richardson, ordered one hundred rail car loads from the Knoxville Marble Company, "one of the Ross quarries." McAdams, 5; Monroe, *Harper's Weekly* (7 May 1887), 330.

capitol set new standards that many were quick to follow, particularly those states representing the moving wall of westward expansion. Montana, which achieved statehood in 1889, began building ten years later. Authorizing legislation passed in 1897 stipulated that only Montana builders and architects could be retained for the project. In 1899, Helena-based architects Bell & Kent designed a domed building reminiscent of both the Minnesota and Rhode Island state houses; additions were designed by New York architect Frank Mills Andrews, and the Billings architectural firm of Link & Haire, in 1905. The exterior, of Montana granite and Columbus sandstone, featured a shining copper dome that announced the state's newly discovered riches to all. The interior made generous use of Tennessee marble for stairs, hallways, columns, and fireplace surrounds.[86] These materials were, without doubt, hauled by rail. In fact, Albro Martin has argued that the entrepreneurial James J. Hill purposely built lines through Montana because of its mineral riches.[87]

Wisconsin, whose capitol building had burned in 1904, hired prominent architect George B. Post to begin planning a new one in 1906. Post, a civil engineer, had been a youthful protégé of R.M. Hunt's in New York City. He had also worked in Burnham and Root's office in Chicago during the planning for the World's Columbian, for which he had designed the Manufactures and Liberal Arts, an

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[86] Carroll Van West, "A Landscape of Statehood: The Montana State Capitol" *Montana: The Magazine of Western History* 37 (Autumn 1987), 73-75; National Park Service, National Register of Historic Places, *Montana State Capitol*, Lewis & Clark County, entered 1981.

[87] Martin, 292.

engineering accomplishment for its sheer size. In Madison, he called for white Vermont granite for the building's exterior. As had Gilbert in St. Paul, he created an interior rotunda that showed off a variety of marble colors and patterns, including slabs of Tennessee marble.[88]

About this same time, elected officials charged with overseeing the United States Capitol hired the New York firm of John Carrère and Thomas Hastings to design separate office buildings for the House and Senate. The true test of these handsomely appointed buildings was how well the American Renaissance, or second classical revival, style would work in proximity to the first. The firm was also consulted on an "extension" of the building's east front—the oldest section of the building—where the deteriorated original sandstone was to be replaced by white marble, the pediment sculpture finally executed, and needed alterations made to the building's interior.[89] The new office buildings must have found favor with their Capitol Hill patrons, for the record is unusually bereft of political criticism of their building project. Correspondence in the files of the Architect of the Capitol confirms that some of the firm's design suggestions for minor renovations to the House and Senate chambers were also carried out. As late as the 1920s, after the death of his partner, Hastings continued to advise Superintendent of the Capitol and Acting

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[88] According to Thomas N. McAdams, the Tennessee marble used in Madison came from the H.B. Stamps quarry in Hawkins County. McAdams, 15.

[89] Some of Carrère & Hastings's recommendations on the subject date from as early as 1904. However, the façade extension, of white Georgia marble, was not completed until January 1961, just in time for John F. Kennedy's inauguration. Allen, 380-81, 390-91, 426-428, 432.

Architect, Elliott Woods, on minor matters related to the aging Capitol building, such replacing tile floors with marble.[90]

Before Carrère & Hastings came on board, however, Woods had been involved in remodeling the space formerly occupied by the Congressional library, which had moved out of the Capitol and into its own building in 1897. He created a number of new committee rooms, for which marble flooring and marble mantels were wanted. Bids received in 1900 and 1901 from seven marble companies, including Evans Marble Company and L. Hilgartner & Sons, both of Baltimore, followed the customary protocol extending back to the days of Walter and Meigs. These specified that the work was to be done in "Vermont, Italian Statuary (white) and Sienna (gold), and either dark or gray Tennessee marble."[91] Even though the architect's report for 1901 stated that all of the mantels in the new rooms were Italian marble, bids received from Hilgartner & Sons and accepted by Elliott Woods indicate that three of the mantels furnished were of Tennessee marble.[92]

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[90] Allen, 411.

[91] In 1920, however, when Hastings was consulted about new floors for the corridors of principal floor and basement level of the old building, he summarily dismissed the notion of using Tennessee marble as "too modern," choosing instead "Glen Falls" black and Alabama White from Hilgartner & Sons. He suggested: "they are more the kind of marbles that Dr. Thornton or Latrobe would have selected." Thomas Hastings to Elliott Woods, 19 July 1920, Architect of the Capitol, RG 43:2, Capitol Building Files.

[92] Allen, 371, 477. Correspondence between the years 1900 and 1920 indicated that Tennessee marble was offered as an alternative to or in combination with the slightly more expensive Italian marbles in bids from a number of companies, including Evans, Hilgartner, and J.F. Manning & Company of Washington, D.C. Architect of the Capitol, RG 43:2, Capitol Building Files.

Between 1905 and 1910, the Kentucky State Capitol, considered too small and too poorly arranged for fire safety once electricity had been added to existing heat and light sources, was rebuilt. The new, domed building, Beaux-Arts neoclassicism exemplified, was designed by New York architect Frank Mills Andrews (who had recently completed work on the Montana State Capitol) and built of Indiana limestone. The building's interior includes white Georgia marble, gray Tennessee marble, and dark green Italian marble, as well as a hallway lined with thirty-six monolithic granite columns from Vermont. [93]

Such ambitious buildings, both in scale and detail, required building materials that were not only substantial in appearance, but could also sustain a sumptuous array of design and motif. Marble, which lent itself more readily to sculptural carving than granite, became, for many of these, the material of choice. Even though the vast majority of the buildings on the Chicago fair site had been temporary, the scale of the buildings that followed was made possible the use of iron and steel structures that could support cladding in veneers of light-colored stone or pale glazed terracotta tiles. In addition to white or light-colored marble, granite, limestone, and tile, the light pink Tennessee marble, which in its unpolished state appears to be a warm off-white color, began also to be specified by architects for exterior use in public buildings in Eastern cities, as well as in the South, the Mid-west, and West.

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[93] Kentucky: Division of Historic Properties http://historicproperties.ky.gov/hp/capitol/ [accessed 1 April 2011]

Given the timely exposure at the 1893 Chicago fair, important national publicity given Tennessee marble about this same time continued to bring it to public attention. *Limestones and Marbles: Their History and Uses*, by S.M. Burnham (1883), found among the personal papers of Knoxville's John J. Craig, is stamped and inscribed with his name and the date January 1894. Plates one and two featured images of colorful Tennessee marble. The author referred to Tennessee "the great marble-producing state of the Mississippi basin" and quoted Safford on the history of its use in the extensions of the national capitol, adding: "The Grayish-white is only a species of the Variegated, and on account of its great number of Corals and Crinoids, is sometimes called Coralline or Encrinal marble. It is below the Variegated, and forms a mass of light-gray, sparry limestone or marble, mottled with pink and red; sometimes it is white. It is worked at Knoxville, and in commerce it is often called Knoxville marble."[94] In G.P. Merrill's *Stones for Building and Decoration* (1891), he, as curator of geological specimens for the National Museum, also gave Tennessee's marbles prominent mention.[95]

As we have seen, so did many geology publications at this time. While perhaps more industry-focused, there is no doubt that they, too, had an impact on the rise in its use as a building stone.[96] An 1892 report by Arkansas State Geologist

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[94] S.M. Burnham, *Limestones and Marbles: Their History and Uses* (Boston: S.E. Cassino & Co., 1883), 76-77.

[95] Merrill, 102-103.

[96] See previous citations for Willis, 1888; Merrill, 1891; Branner, 1892; Ferris, 1894 in chapter two of this paper.

John C. Branner recorded that Tennessee ranked fourth nationally in production and second in value of marble produced during 1889.[97] In 1894, University of Tennessee Engineering School professor Charles Ferris noted that the flawless, close-grained pink and gray marbles from around Knoxville were beginning to compete with granite as a building stone, adding: "The Blackstone Memorial Library, at Branford, Connecticut is now being built with a four inch veneer of pink marble. As Branford is situated in the centre of the granite region of Connecticut, this speaks volumes in favor of Tennessee marble."[98] The varied colors and types of Tennessee marble had already insured its popularity for interior use. In at least two instances, late nineteenth-century patrons on a tight budget had to settle for painted imitations.[99] Since different methods of cutting (with or across the grain) could yield different patterns from the same stone, Tennessee's versatile and vari-colored interior marbles proved a ready complement to the rich décor of American Renaissance rooms. But it would be the durability of the pink and gray marbles, their high crushing strength, absorption resistance, and resistance to high temperatures, all

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[97] Branner, 190.

[98] Ferris, 27-28.

[99] The Salt Lake or Mormon Tabernacle, constructed 1864-67, included faux-painted white pine benches with "oak" surfaces and columns of the same wood that were decorated to mimic Tennessee marble. http://utah.official-city.com/salt-lake-tabernacle-salt-lake-city-utah-3 [accessed 29 January 2011] In 1872, the enormous gothic Trinity Methodist Church in Atlanta, which had broken ground in 1870, had a basement interior painted to look like Tennessee marble. *Atlanta Daily Sun*, 18 April 1872.

noted by Ferris, that also made them suitable for flooring and guaranteed the widespread dispersion of Tennessee marble across the country over the next several decades.[100]

Chicago being the terminus of at least eleven railroad lines by the time of the World's Columbian Exposition, one natural extension of the fair's influence was a proliferation of Beaux-Arts-influenced railroad terminals across the country. These stations marked large city termini and appeared at important nodes on the cross-country rail lines. They quickly became important public showcases for stone construction and many of their decorative interiors featured marble. Proclaiming the prosperity and status of railroad corporations, they also proved a boon for architects, who had the almost unprecedented opportunity to see their visions fulfilled on a massive scale and with massive budgets. No doubt encouraged to take advantage of free or low-cost long-line freight shipment, they used prestige building materials to make these new terminals exciting civic spaces. The terminals soon became destination locations for public enjoyment and edification, their scale and richness a source of local pride.

The grandest of these, McKim, Mead & White's massive Pennsylvania Station in New York City (1905-1910), was built of light pink Milford granite hauled to the site in over one thousand Pennsylvania Railroad cars.[101] Charles McKim designed the innovative curved steel-frame vaulting and glass ceiling to admit daylight into

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[100] Ferris, 19, 20, 28.

[101] Steven Parissien, *Pennsylvania Station: McKim, Mead and White,* Architecture in Detail series (London: Phaidon Press, 1996),13.

the multi-leveled concourse, and modeled the long barrel-vaulted waiting room, which rose to a height of one hundred and fifty feet, on the Roman Baths of Caracalla. In further imitation of that classical monument, the walls of the waiting room were covered in the same warm-toned Italian travertine marble as the original. William Symmes Richardson, McKim's young protégé, who carried out the final details after McKim's death in 1909, noted that the use of the buff-colored travertine was a practical rather than decorative decision, since it tended to take on a polished patina through use instead of absorbing dirt.[102]

In 1902, the Pennsylvania Railroad's main competitor, the New York Central Railroad, held an architectural competition for the design of a new and enlarged Grand Central Terminal. The massive building would straddle the innovative tunnel system originally created under Park Avenue to handle smokestack emissions, organize the new electric lines, and accommodate increased passenger traffic. Railroad officials rejected three firms, including Daniel Burnham's and McKim, Mead & White, in favor of St. Paul's Reed & Stem. The officials later appointed the New York firm of Warren & Wetmore to the project as consulting architects.[103] In keeping with his Beaux-Arts training, architect Whitney Warren devised a building scheme inspired by the notion of train station as portal to the city. Accordingly, the building's granite and limestone exterior emulates a triumphal gateway; however,

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[102] Ibid., 12, 17.

[103] James Marston Fitch and Diana S. Waite, *Grand Central Terminal and Rockefeller Center: A Historic-critical Estimate of Their Significance* (Albany: New York State Parks and Recreation: Division for Historic Preservation, 1974), 2-4.

because of the station's elevation above street level, the three large arched entrances actually function as upper level light sources for its enormous concourse. The central space, dominated by an oval vault painted deep blue, with the constellations delineated, rises one hundred and twenty-five feet from the floor. In its use of plain glass for the windows and clerestory and with walls clad in plain, light-colored marble and simulated stone, the interiors were in keeping with the toned-down classical simplicity of Pennsylvania Station.[104] The latter, now demolished, may have employed a light-colored marble for the floors of its huge waiting room—perhaps a light shade of durable Tennessee pink to match the beige Italian travertine walls. From photographs, the flooring in the enormous Pennsylvania Station concourse, a solid-color material installed in a non-skid pattern, does not look like marble. Its design was probably part of McKim's plan that this most functional area of the station should reflect its utility. In contrast, one fo the most beautiful elements of Grand Central Terminal is the smooth dark pink marble flooring from Tennessee.[105]

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[104] Ibid., 4-6.

[105] Wayne Powell, http://academic.brooklyn.cuny.edu/geology/powell/613webpage/NYCbuilding/TennesseeMarble/TennesseeMarble.htm; http://www.grandcentralterminal.com/info/walkingtour.cfm, [both accessed 1 April 2011]; Angela Carr, "Union Station and Its Architectural Heritage," *Historic Structure Report: Toronto Union Station* (Montreal: Fournier Gersovitz Moss & Associes Architectes, 2005), 19.

The Warren & Wetmore firm also designed Winnipeg's Union Station (1908-1913). This building was one of the first Canadian terminals of Beaux-Arts style. New classically inspired stations soon arose in Ottawa and Vancouver. Canada's grandest Beaux-Arts exemplar, Toronto's Union Station, although it was being planned in 1905 by the New York firm Carrère & Hastings, was not completed until 1919. The massive terminal was intended to serve three major railroads: the Grand Trunk Railroad, the Canadian Pacific Railroad, and the Canadian Northern Pacific. Carrère & Hastings, probably for political reasons, affiliated with several Canadian architects, including Ross & MacFarlane (later Ross & Macdonald); Hugh Griffith Jones, assistant chief architect for the Canadian Pacific; and John MacIntosh Lyle, a Beaux-Arts trained architect who had once worked in their firm in New York City. All were given credit for the final building. Constructed of Indiana limestone, it rivaled Pennsylvania Station in scale and in its barrel-vaulted great hall. The flooring, shipped by rail, was of Tennessee marble laid in a herringbone pattern to match the hall's coffered ceiling.[106]

During the early decades of the twentieth century, Tennessee pink and gray marble was widely used for flooring not only in railroad terminals but also in other public buildings. Georgia's Macon Terminal Station (1916), a Beaux-Arts-style building with a central columned entrance portico and flanking wings, by New York City architect Alfred Fellheimer, served the city's fifteen operating railroads. The

[106] The similar patterning of marble flooring evident in photographs of the no longer extant Pennsylvania Station suggests the possibility that the concourse flooring of that station might also have been of marble. Carr, 20, 22-26.

building is of limestone, with interior floors and walls sheathed in Tennessee pink marble.[107] San Francisco's City Hall (1915) boasts ten acres of Tennessee marble, including a spectacular cascading staircase of pink marble and matching flooring set off with a diamond-like pattern of darker marble in its central rotunda. The domed building, designed by Beaux-Arts-educated architects John Bakewell and Arthur Brown, Jr., was the centerpiece of a City Beautiful plan initiated for the Panama Pacific Exposition.[108] Winnipeg's Manitoba Legislative Building (1913-20), a provincial capitol building designed by Beaux-Arts architect Frank Worthington Simons, features a central rotunda floor with a similar decorative treatment using Tennessee marble as the predominant field and accents of Vermont black and green.[109]

One of the finest showcases for Tennessee marble in this era set a precedent for many of the federal buildings that would be erected during the Great Depression. James Gamble Rogers's courthouse for New Haven, Connecticut (1913-1919) used Tennessee pink marble on both interior and exterior. In 1910, the city of New Haven had invited Cass Gilbert and Frederick Law Olmsted to create a unified plan for future additions to its central green space. Their plan required that all new

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[107] Fellheimer and Steward Wagner, partners in the successor firm to Reed & Stem, also created Cincinnati's flamboyant Art Deco-style terminal in 1929-33. Grow, 121.

[108] San Francisco City Hall, virtual tour, downloadable .pdf at http://www.sanfrancisco.gov [accessed 28 March 2011]

[109] Manitoba Legislative Building tour, http://www.gov.mb.ca/legtour/legbld.html [accessed 2 April 2011]

buildings be created in harmony with existing structures. Rogers, also the architect for Yale University, was hired by the U.S. Treasury Department. His charge was to create a building in keeping with local design regulations that would also be immediately recognizable as dignified federal architecture. His neoclassical design has a Corinthian-columned entrance portico, a triangular pediment, and niches on either side of the entrance. The exterior cladding is pale-colored Tennessee marble; the outside steps of pink Milford granite. In the interior, the same marble, polished to show its pink color, was used for the main staircase, the elevator lobbies, and for twenty monolithic columns in the second floor lobby outside the courtroom.[110] This building's simplicity has worn well; its fresh appearance evidences the crispness of effect that must also have attracted architects to Tennessee's durable buff-colored stone. Rogers was one of the last private architects to be granted a contract for a building erected under the auspices of the Treasury Department. Federal government projects to come, during the massive Depression-era building boom designed to boost local economies, would be governed by a design template created by architects within the Washington bureaucracy.[111]

In comparison, the Library of Congress, by Washington architects Paul Pelz and John Smithmeyer, is a testament to the era of cyclical architectural fashion that

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[110] Richard C. Lee U.S. Courthouse, New Haven, historical building description. http://www.gsa.gov/portal/ext/html/site/hb/category/25431/actionParameter/exploreByBuilding/buildingId/0901 [accessed 26 January 2010]

[111] Christine Kreyling, *From Post Office to Art Center: A Nashville Landmark in Transition* (Nashville: Frist Center for the Visual Arts, 2001), 25-26.

existed in federal construction projects during the decades following the Civil War. This type of architectural eclecticism is likely what Gilbert and Olmsted's report for the city of New Haven was designed to prevent. To be fair, the Library of Congress design had been conceived prior to the World's Columbian Exposition. With its construction overseen by the U.S. Corps of Engineers and completion delayed until 1897, it is unlikely that the original plans could have been updated even if some had recognized that it would seem out of step with the times by the time it opened.[112] Even so, the library's mural program, probably influenced by that of McKim, Mead & White's Boston Public Library, included some of the same artists employed in other American Renaissance buildings, and its interior showcased many fine and exotic materials, including Tennessee marble. However, the building's singular style marked the end of the era of eclectism in federal architecture. The American Renaissance style would continue to predominate over the coming decades as Americans embraced the predictable appearances of buildings designed for public use like railroad terminals, libraries, post offices, and courthouses.

During the two decades following the World's Columbian Exposition, libraries, some of the first public manifestations of individual largesse, which had at first had retained the trappings of wealth and egoistic architectural preference, also became truly "public." Architectural historian Richard Guy Wilson has credited Charles McKim with adhering to the Beaux-Arts principle that appearance should reveal function by borrowing from both the Bibliothèque Saint Genevieve in Paris as

[112] Allen, 369.

well as public gathering places such as the Roman coliseum for both its significance and its design motif of arches running the length of the facade.[113] The prominence and popularity of McKim, Mead & White's Boston Public Library had a decided influence on the library as a building type: organized for ease of use, with interior lighting symbolic of the "enlightenment" that comes from learning.[114] Even though the London-based financier, George Peabody, and the Chicago real estate man, Walter Newberry, some of the first philanthropists to endow library buildings in the United States, had turned to professional architects like Henry Hobson Richardson to create romantic, medieval-style buildings in acceptable academic style, it was McKim, Mead & White's elegant and austere Boston Public Library, a demonstration of the Beaux-Arts principle of "public" character and the first library erected with public funds, which became the longest-lasting precedent for a new wave of library buildings.[115]

As the City Beautiful movement spread across the country following the Chicago fair, library and museum buildings took on a familiar appearance. The proliferation of neoclassical style for library buildings was also spurred along by the

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[113] Wilson, 48-49.

[114] The American Library Association, one of the earliest professional groups in the country, was established in 1876. Soon thereafter, librarians began to make their opinions known, even lobbying architects over the practical requirements of library buildings. Van Slyck, 5.

[115] Van Slyck, 2, 3, 28. According to an article written by one of the library's reference librarians, the library's vestibule was lined with Tennessee marble. Frank H. Chase, "Boston Public Library," *Journal of the National Education Association* II,4 (1922): 131.

exponential influence of self-made billionaire Andrew Carnegie, who, over a period of less than twenty years, endowed more than sixteen hundred libraries in cities and towns across the United States. Carnegie's first libraries, in his boyhood hometowns of Dumferline, Scotland, in 1881, and Allegheny City, Pennsylvania, in 1886, were both fashionably eclectic in style. Carnegie sponsored a competition for his first major public architectural statement, to be built in Pittsburgh, home of Carnegie Steel. He chose the H.H. Richardson firm's successor, Shepley, Rutan & Coolidge's medieval-revival design over the proposals of C. Leopold Eidlitz (who had worked with Richardson on the New York State Capitol) and the Library of Congress's Smithmeyer and Pelz.[116] In the coming decades, as Carnegie continued the process of holding competitions for libraries in large cities, such as Atlanta (1901), Nashville (1904), St. Louis (1907) and Detroit (1913), variations on Beaux-Arts neoclassical style would become standard for the hundreds of Carnegie library buildings to follow.[117]

One of the first libraries to assume the American Renaissance style, however, was created as a private museum and library *de luxe* for banker and financier J. Pierpont Morgan. On the exterior, the Morgan Library (1901-1906) designed by McKim, Mead & White's Charles McKim, is a modest and moderate in scale

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[116] Shepley, Rutan & Coolidge were former associates of the just-deceased Richardson. Steffenson-Bruce, 27. It is interesting to note the transitional nature of this library's interior, which also included an attached music hall with such neoclassical features as Renaissance marble arches and Corinthian columns. Van Slyck, 10-11.

[117] Van Slyck, 56.

Renaissance-style building. Built to house Morgan's valuable collection of historical objects on paper (drawings, prints, books and manuscripts), its solid, box-like structure is reminiscent of a treasure chest or, perhaps, a bank vault. The material chosen for the smooth ashlar walls, laid "dry" as blocks of dimensional stone, was light-colored Tennessee pink marble.[118] McKim was so intent on impressing Morgan with the building's construction technology that he worked from a wax impression of the jointing on the Erectheum to ensure that the mortarless walls of the Morgan library had the correct appearance.[119] Whether Morgan himself had requested the specific building material for the exterior, or the McKim, Mead & White firm, which had used Tennessee marble for interiors of the Boston Public Library and the University Club in New York (1896-1900), had recommended it, at least three Knoxville-area marble companies were contacted about the project.[120] Nearly identical bids from three Knoxville-area marble dealers, the Ross Marble

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[118] An unsigned letter from general contractor Robert C. Fisher Company to building contractor Charles T. Wills, dated 26 October 1904, bemoaned the cost overruns. Yet, the anonymous writer described the building with pride: "So far as the writer is informed, this is the first time in history that any building has been erected in this manner from the time of the ancient Greeks. Furthermore to say when the ordinary buildings erected in the City of New York, such as private residences and office buildings and all buildings built by modern construction, will have tumbled and passed away, this little building will be standing as a monument similar to those now upon the Acropolis." New-York Historical Society, PR 042, Morgan Library, box 269.

[119] Wilson, 45, 221-223.

[120] The University Club exterior was pink Milford granite, with "white Norwegian marble, pink Knoxville marble and black Irish marble" used for trim and flooring in the main foyer. Wilson, 188.

Company, the Republic Marble Company, and John M. Ross, Marble Dealer, were prepared in September 1901.[121]

But further investigation into the suitability of materials was apparently needed; a year or so later, project architect Charles McKim received reports from two New York firms that had sent representatives south to assess the Knoxville area marble. The recommendations of Edward B. Tompkins, Robert Fisher & Company, and A.H. Tyson, Charles T. Wills' company, are included in memoranda prepared for McKim, dated 3 January 1903. In addition to spending time at the Ross and Republic operations, one or both of these men also inspected or at least considered the Evans Marble Company quarry at Forks of the River, the John J. Craig Company operations near Friendsville, and the [Tennessee] Producers Marble Company. Both New York firms suggested purchasing from John M. Ross, who had a quantity of marble on hand and enough of uniform color to satisfy the building requirements.[122] The Tompkins memo confirms that the Ross marble "conforms absolutely with the

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[121] That these three had some sort of business relationship is evident from these bids, which came from a similar address and quoted the same prices, while specifying different brands or types of marble. Ross's father had been one of the early Knoxville marble men engaged in commercial business. His heirs sold some or all of the quarry land to the Evans Marble Company in 1899. Son John was by this time engaged in his own quarry and mill operation. Frank S. Mead, whose father had come to the Knoxville Iron Company from New York soon after the Civil War, had bought property from both John M. Ross and the Ross Marble Company for the Ross-Republic Marble Company, which he appears to have organized, in 1900. Knox County Archives, Property Deeds; Knox County Public Library, McClung Historical Collection, Vertical file.

[122] Many years later, John M. Ross acknowledged in a letter dated 20 March 1923, to an architectural firm that his company's Ross-Pink was the marble used in the Morgan Library. New-York Historical Society, PR042, Morgan Library, box 382.

marble selected by Mr. Morgan, and can be quarried as Mr. McKim wishes it, some with veining and some without, while securing the greatest uniformity of color," which suggests that Morgan and/or McKim had initiated the quest for a specific marble. A follow-up letter from Tompkins, dated 8 January 1903, indicated that Fisher had secured the job.[123] He stated that "the entire order can be quarried and shipped in six months and considering the guarantee of the Railroads, via Atlanta for 15 day delivery from Knoxville into our Yard at Port Morris, consider the delivery absolutely conclusive."[124]

While the exterior of Morgan's library building included both sculpture-in-the-round and sculptural reliefs by contemporary artists, the interior was designed to incorporate such carefully selected architectural elements as an antique marble floor, antique columns and mosaics, and fifteenth-century Florentine doorways, mantelpieces, and a ceiling. Sculptor Adolph Weinman, who also designed monumental eagles and the two female figures symbolizing "day" and "night" for the porticos of McKim, Mead & White's Pennsylvania Station, created two horizontal sculptural relief panels in Tennessee marble for the space above the flanking niches

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[123] Charles T. Wills was a builder who apparently oversaw the Fisher Company, which was the main subcontractor for the building. New-York Historical Society, PR 042, Morgan Library, boxes 268-69.

[124] The Tompkins memo of 3 January 1903 stated that the railroad route through Cincinnati (on the L&N) sometimes took from thirty to sixty days as opposed to the guaranteed fifteen-day delivery via Atlanta (on the Southern Railway). New-York Historical Society, PR 042, Morgan Library, boxes 268-269.

on either side of the building's arched entryway.[125] Edward C. Potter was commissioned to sculpt "maneless lions of the Assyrian type" from the marble, for the front entrance. There must have been some question as to either the design or execution of the lions, for eminent sculptor Daniel Chester French, having apparently been dispatched to inspect them, wrote to McKim: "It was a very difficult problem that you gave to Potter and he has solved it admirably."[126] French also seems to have served as a champion for American artist Andrew O'Connor, whose commissioned designs, which were to be carved in the marble by Piccirilli Brothers, were apparently delayed.[127] And there were other problems. A series of strikes in the building trades created embarrassing delays in the work and caused a disagreement over added labor costs between Wills and the Fisher Company. During the period of work stoppage, Wills wrote John M. Ross to inquire whether his company could execute a marble fence needed to mark the street boundary of the Morgan Library. Ross's carefully considered response had three parts: first, that he could not provide the high grade of workmanship nor did he have the machinery

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[125] Parissien, 11, 14; New-York Historical Society, PR 042, Morgan Library, box 269.

[126] Letter dated 5 February 1906, addressed: "Dear McKim" and signed: "Faithfully, French." New-York Historical Society, PR 042, Morgan Library, box 382.

[127] While the designing artist is credited as sculptor for monumental works like these, the common practice of the day was to hire expert artisan carvers, many of whom came from marble-producing areas of Italy, to produce large-scale pieces. Letters from Piccirilli Brothers and Daniel Chester French to McKim, Mead and White, dated 16 February 1905 and 27 February 1905. New-York Historical Society, PR 042, Morgan Library, boxes 268-69.

necessary to execute the job; second, he was concerned about shipping such finely finished pieces; and finally, he suspected that New York unions would prevent their members from setting any work cut outside of New York City. However well-founded the protectionist intentions of the workmen's organizations, they seem, at times, to have been sabotaged by their own logic. Wills reported to McKim, Mead & White that the Fisher Company had a difficult negotiation with the Reliance Labor Club (of marble cutters) and affiliated tradesmen: the cabinetmakers, the tile, granite and mantel association, who refused to set the antique marble pieces at the library on the basis that they had not been carved by union labor.[128]

Even before the library was finished, however, it attracted admirers. A letter in August 1905 from the Boston architecture firm of Winslow & Bigelow mentioned a group of trustees who hoped their proposed Shawmut bank could be created from the same marble.[129] Morgan must have been equally pleased, as the same Tennessee marble appeared several years later in the exterior construction of Morgan's bank at 23 Wall Street (1913-14). For this project, Morgan had chosen the firm of Trowbridge & Livingston in a competition—perhaps because he liked their work on the Bankers Trust Company (1910-12), a fifteen-story building of light-

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[128] John M. Ross to Charles T. Wills, 8 February 1905. For the same job, a proposal from George Brown & Co., Cut Stone Contractors, New York, indicated that they could furnish and set the Knoxville marble for $29,875.00. George Brown & Company to Charles T. Wills, 8 February 1905. Charles T. Wills to McKim, Mead & White, 26 June 1905. New-York Historical Society, PR 042, Morgan Library, box 268.

[129] New-York Historical Society, PR 042, Morgan Library, box 269.

colored granite just across the street.[130] Like the library, Morgan's low-rise Classical Revival bank building was tastefully restrained and elegant in its simplicity.[131] And just as solidly built. An article in a trade publication entitled the *Real Estate Record and Guide* described the new bank as "a rival to the Parthenon," continuing: "The best skill which Athens could command at the height of her glory was given the construction. The quarries at Knoxville, Tenn. were torn to pieces to produce the blocks."[132]

One of Morgan's great admirers was Canadian railroad man and financier James Jerome Hill, with whom he had both a business and personal relationship.[133]

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[130] Morgan may already have known the architects. He was one of the founders of Bankers Trust, created in 1903 to serve as a subsidiary company that could handle extra-banking financial transactions. The Bankers Trust building, to which sixteen additional floors were added during a 1933 remodeling, originally had a light-colored, two-story marble-wrapped banking hall, which was removed during remodeling. (One can only speculate as to whether it might have been Tennessee marble.) Christopher Gray, "Bankers Trust: The Building Known for its Ziggurat Top," *New York Times* 21 January 2007.

[131] *Money Matters: A Critical Look at Bank Architecture,* 74-75.

[132] In a *New York Times* article about the bank building, the writer stated that it was constructed of the same pink marble as the library. Christopher Gray, "J.P. Morgan & Company Bank Headquarters-23 Wall Street-by Trowbridge & Livingston," *New York Times* 20 April 2003.

[133] The two men became acquainted during the height of "Morganization," when Morgan and his investors were shoring up the Northern Pacific Railroad. Hill, as an executive of the Great Northern, wished to form an alliance with the ailing Northern Pacific. After initial resistance to the idea, Morgan realized that Hill's managerial skill and knowledge of the railroad business could work to mutual benefit, and they worked together to prevent the takeover of the NP by rival financiers. The men remained close associates in the years thereafter. Michael P. Malone, *James J. Hill: Empire Builder of*

Late in his life, Hill left a legacy in the form of a library to his adopted city of St. Paul. It, too, would be constructed of Tennessee marble, which he had admired in Morgan's New York buildings. Hill earned the nickname "The Empire Builder," now immortalized in a train route across the northwestern states, by purchasing a defunct railroad in St. Paul with three partners in 1878 and parlaying it into the Great Northern Railroad.[134] A shrewd and hardworking businessman, he also established himself in banking and real estate, as well as in the wheat, cattle, and lumber interests that occupied his vast western holdings.[135] He, like Morgan, enjoyed collecting fine art objects and was equally interested in substantial, yet conservative, personal surroundings.

Hill and his chief railroad engineer Nelson D. Miller (or perhaps Colonel C.C. Hill, the man responsible for the stone bridge across the Mississippi at Minneapolis) may have designed the Richardsonian brick and stone block housing his Great Northern Railroad Company themselves. But Hill engaged Boston architecture firm Stearns & Peabody to build his Richardson-influenced home on the city's Summit Avenue.[136]

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the Northwest (Norman: University of Oklahoma Press, 1996), 181-184, 209-215; Martin, *Railroads Triumphant*, 328.

[134] Ibid., 4.

[135] Ibid., 90-91; Leonard K. Eaton, *Gateway Cities and Other Essays* (Ames: Iowa State University Press, 1989), 41; Hillstrom, 82.

[136] Eaton, 57.

When the city of St. Paul had approached Andrew Carnegie in 1901 about building a library for their city, he refused on the basis that Hill had the means to act in his stead.[137] Hill, concerned about the hard-won legacy of his generation and convinced that standardization of the public education system would lead to its failure, had for some years made a practice of contributing money to small denominational schools instead of to public coffers. After the city of St. Paul proposed to build a public library, however, Hill decided that he could best support motivated individual citizens by providing a sophisticated reference library to go along with it. As the city began to plan the building in downtown St. Paul's Rice Park, raising money through subscriptions, bequests, and public bonds, Hill offered to donate and furnish a separate reference wing. Typical of Hill's hands-on management style, he was largely responsible for engaging the same architect for both projects, and also brought along the contractor, supervising both personally until the building was completed.[138]

Architect Electus D. Litchfield, who had studied at the Brooklyn Polytechnic Institute and worked with Carrère & Hastings before opening a three-man practice with Evarts Tracy and Egerton Swartout on Fifth Avenue, was Hill's choice to design both buildings. He had first become acquainted with Hill in 1875, possibly through his uncle, Reverend William C. Pope, who apparently put his name forward for the

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[137] Jeffrey A. Hess and Paul Clifford Larson, *St. Paul's Architecture: A History* (Minneapolis: University of Minnesota Press, 2006), 97.

[138] Albro Martin, *James J. Hill and the Opening of the Northwest*, 1976, reprint (St. Paul: Minnesota Historical Society Press, 1991), 595-97.

job.[139] As soon as he received the commission in 1912, Litchfield was tasked by the library board with incorporating the suggestions of a professional library consultant into the plan, so that the library would reflect the latest in functional design features. In a letter to James J. Hill, composed several days after returning to New York from St. Paul, Litchfield wrote:

> The prospect of building the library for you and the people of St. Paul appeals greatly to my imagination, but entirely apart from that, the pleasure of meeting you and Mrs. Hill and of seeing your wonderful collection of paintings has been very great. I have been looking at Mr. Morgan's library this morning. You are correct in its length, which seems to be just 120 feet. Your library will probably have to be somewhat higher if built with two stories or one story and gallery, and therefore to be correct in proportion may have to be a trifle longer. You have set us a high standard in taking this building for comparison, but I shall do my "durndest," and I hope that you will not be dissatisfied with the final result.[140]

Using the Morgan Library as example, Litchfield wrote building specifications that called for "light colored Tennessee marble … it may be from the several of the Tennessee marble quarries but there shall be no greater variation in color and character than shown in the samples at the Architect's office … Colorado Yule or Georgia Cherokee Gray marble will be considered." The specifications also included the following note: "Whatever the walls of the building, set the floor slabs in the

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[139]"St. Paul's Central Library" http://www.stpaul.lib.mn.us/locations/central-history.html [accessed 12 October 2007]

[140] Electus D. Litchfield to James J. Hill, Esq. , 8 October 1912. James J. Hill Reference Library, James J. Hill Papers.

loggia of marble, as below specified [‘all of Tennessee marble’].”[141] Historian Michael Malone has suggested that Hill’s wife, Mary, and daughter, Clara, designed the building’s interior “fashioned in Tennessee pink marble.”[142] Three bids to furnish Tennessee pink marble were received from Victoria Marble Company, N.H. Brown & Company, and Fenton Construction Company. The latter bid, which included setting the marble in place, was accepted. Shipping receipts of marble sent from April through July 1914, indicate that fifty-eight rail car loads of Tennessee marble were shipped to St. Paul in care of Butler Brothers Building Company and the local C.H. Young Co., which was sub-contracted to cut and set the stone after all.[143] While it is not possible to determine origin quarry or quarries from these documents, it is interesting to note that the lines on which the marble was transported were primarily the Southern, Pennsylvania, and P & R lines.[144] Of the original bidders, the Victoria Marble Company operated quarries in the Asbury or

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[141] Electus D. Litchfield, “Specifications of Material to be furnished and labor to the performed,” September 1913. James J. Hill Reference Library, Louis W. Hill Papers.

[142] Malone, 268.

[143] The Fenton Company was involved in a concurrent public library project for the city of Knoxville. The Lawson McGhee Library (1915-1916) was designed by Grant C. Miller, Fullenwider and Dowling, Chicago with local architect A.B. Baumann. This no longer extant American Renaissance-style building, which was finished in terra cotta, sat upon a Tennessee marble foundation that came from the Ross & Republic Marble Company. The roof was red tile. The interior was Tennessee marble, for which the contractor was Fenton Construction. Historic American Buildings Survey (HABS-TN-213).

[144] Butler Brothers to Mr. Electus D. Litchfield, 10 December 1913, Statements of Account, James J. Hill to Butler Brothers, June-August, 1914, James J. Hill Reference Library, Louis Hill Papers.

Forks of the River section, and the name Brown, which was from time to time associated with T.S. Godfrey, in both the Asbury section and in Concord, suggests that even if the John J. Craig Company had been involved (Craig had various affiliates and partnership agreements with other local marble men), the marble came from his Knox County affiliates rather than the Blount County quarries.

The finished library building seamlessly joined the two wings into one façade, giving it the intended appearance of an Italian Renaissance palazzo, with entrances to the separate spaces through doors to the left and right. While it certainly bears resemblance to the Morgan Library, the St. Paul Public Library and James J. Hill Reference Library (1914-1917) also paid homage to the Boston Public Library in its scale and its continuous arcade of round-arched windows. About ten years later the Carnegie Corporation did fund two branch libraries in St. Paul, both in modified Renaissance style with similar round-arched window openings echoing those of the main library.[145]

Although some of the earliest designs for Carnegie's large city libraries were chosen by competition, after 1908 he more or less ceased funding large central libraries in favor of decentralized branches that would serve the populations of immigrants and new arrivals to the larger cities. As small library construction proliferated, James Bertram, Carnegie's personal secretary since 1897, began to wield informal design approval. The formula for funding also became standardized: a set amount of $2 per capita for towns with populations over one thousand that

[145] Hess and Larson, 98.

would donate a site for the building and levy a ten percent tax to fund future library operation.[146] Even though the Carnegie Corporation had no overt stipulation to use a certain architect or build in a certain style, the fact that Bertram published "Notes on the Erection of Library Bildings(sic)" in 1911, which included model library plans, suggests that they desired a certain amount of conformity.[147] The emphasis of the Corporation's advice, however, was not in advocating one style over another but a matter of efficiency. By promoting designs that had been effectively used elsewhere, the Corporation supported the increasing professionalization of architects and librarians.[148] Some architects, who became library specialists, received many commissions. Edward L. Tilton, who designed the George Peabody College for Teachers library in Nashville, Tennessee, was one of those. In fact, the Beaux-Arts-educated Tilton, formerly with McKim, Mead & White, carried a letter of introduction from Bertram.[149]

When the New York architecture firm of Ludlow & Peabody received the contract to oversee construction of buildings for the George Peabody College for Teachers campus in 1914 and began doling out projects to affiliates, including the

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[146] Carnegie donated more than forty one million dollars, much of it matched by recipient communities, for the building of libraries in American cities and towns, from 1899-1917. Van Slyck, 22.

[147] The odd spelling is a purposeful use of an economical modern language being espoused by Melvil Dewey, who founded the Columbia University library program. Van Slyck, 233.

[148] Van Slyck, 35, 44, 65.

[149] Van Slyck, 57.

McKim, Mead & White firm, there was no funding for a library. Architect Charles Samuel Peabody was the nephew of George Foster Peabody, whose Peabody Education Fund had been an important catalyst for education in the post-war South and was now backing the creation of a college for teachers in Nashville.[150] A transcription of a telephone call between Charles Samuel Peabody's partner, architect William Orr Ludlow, and the Peabody College president, Dr. Bruce A. Payne, reveals that they had hoped Carnegie would fund the library. Having recruited an impressive gift from John D. Rockefeller the previous year, Payne was concerned that the lack of a library would impede his ability to retain faculty. His fall-back strategy, to try and recruit funding for the library directly through an architect must have worked.[151] Peabody's announcement for the 1917-18 year contained the following notice: "The College received a gift of $180,000 from the Carnegie Corporation, New York, for a building with a capacity of 200,000 volumes, reading rooms, seminar and conference rooms and research in educational problems. An annual appropriation of not less than $10,000 has been provided for

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[150] Mary S. Hoffschwelle, *Rebuilding the Rural Southern Community: Reformers, Schools, and Homes in Tennessee, 1900-1930* (Knoxville: University of Tennessee Press, 1998), 19.

[151] "Mr. Geo Foster spoke to Mr. Carnegie and told me that was a failure" ... "I have that $300,000 for endowment and the library and the summer school bothering the life out of me" … "I have failed for five years on every plan I knew ... the last stroke I can make is to try and get at this building through the architect." Transcription of telephone call, 14 December [1916?], Dr. Bruce A. Payne to William Orr Ludlow, Vanderbilt University Libraries, Special Collections, Peabody College Papers.

the library, which assures its permanent maintenance at a high point of efficiency."[152]

Tilton's library for the Nashville teacher's college, designed in 1917, was completed in 1919. His 1917 drawings specified marble for the flooring in the rotunda, book stacks, and toilets, with a note appended 28 March 1918 that read: "Submit marble floor diagram for approval."[153] Whether he chose the Tennessee marble for the project or left that to the local contractor, (Wilbur F.) Foster & (Robert Thomas) Creighton, is not reflected in existing documents, nor are the source quarries known. However, the light pinkish-brown Tennessee marble used for the rotunda flooring is in good condition today, while the white marble used for the interior steps is cratered and worn. Since Tilton designed many of Carnegie's libraries, it is likely that he specified marble flooring for others. Whether he had used Tennessee marble in previous projects, or used it thereafter, remains a subject for further exploration. The Carnegie Corporation ceased funding libraries in 1917, two years before Carnegie's death. But many cities and towns continued to build libraries along the Carnegie model during the 1920s, using many of the same architects.[154]

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[152] Vanderbilt University Libraries, Special Collections, Peabody College Papers, *Bulletin of George Peabody College for Teachers* V, no. 4 (1917), 19.

[153] Vanderbilt University Office of Campus Planning, Drawings for Peabody College Library, 1917, Edward L. Tilton, A.M. Githens, Associate, 52 Vanderbilt Avenue, New York.

[154] Van Slyck, 217-18.

Even though the explorations of form and economy in construction that had created the skyscrapers was beginning to impel modernist designs among some architects, Beaux-Arts neoclassicism continued to prevail in civic architecture over the coming decades. Architectural historian Richard Guy Wilson has suggested that the firm of McKim, Mead & White, whose influence lingered well into the 1930s and early 1940s, established certain norms for American public architecture: presenting not only 'good design' but also a reassuring glance at the "cultural heritage and accomplishments of Americans."[155] Christine Kreyling, writing about federal architecture projects of the 1930s, has further suggested that the desire for visual order might have been strengthened by anxieties brought on by increased immigration and shifts in the labor economy.[156] Even prior to the stock market crash of 1929, many must have felt at the mercy of powers beyond their control. The reassuring facades of public buildings provided a sense of local and federal government presence. The fact that they were built of materials that exuded strength added to the impression of government infallibility. Where these building materials were readily at hand, as in Tennessee, their familiar appearance engendered local pride, as well as adding prestige for local firms.

One of the strategies used by President Franklin D. Roosevelt's administration to prompt the economic recovery during the Great Depression was increasing allocations for the Treasury Department's architecture program, which

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[155] Wilson, 53.

[156] Kreyling, *From Post Office to Art Center*, 26-27.

created a raft of new federal building projects. Because these buildings adhered to a standardized design type: large rectangular blocks decorated with simplified, modernized (streamlined) versions of classical elements, and used local building materials whenever possible, they provided immediate work for local laborers and could be constructed in a short period of time.

Post office buildings with very similar profiles were erected in Nashville, Knoxville, and Chattanooga in 1932-33. All three projects employed local architecture firms and called for Tennessee marble. Nashville's Post Office (now the Frist Center for the Visual Arts), which still has a small post office operation on the lower level, was overseen by local architects Marr & Holman. While the exterior (figure 19) had originally been specified to be Tennessee marble, white George marble was used instead, with Minnesota granite for the exterior entryways and decorative carving. Most Nashvillians of the current day were unaware that the building was marble, as years of air-borne grime had turned the building gray before it was restored to its original light color during the 2001 renovation. Some of the decorative interior marble, and all of the pink marble used in the bathrooms, came from Tennessee. The contractor for the building, a newly-formed Cincinnati firm named Frank Messer and Company, went on to become a successful regional company.[157]

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[157] Fortunately, this company is still in business, but their early project files are in deep, remote storage and inaccessible at present. Information provided by architect Seab Tuck, Tuck Hinton Architects, design architect for the Frist Center. Personal interview, 25 February 2011.

Figure 18. Marr and Holman Architects, Post Office, Nashville, Tennessee, Courtesy Frist Center for the Visual Arts.

The architect for the very similar Knoxville Post Office, whose exterior is clad in a still light and lively Tennessee pink marble finished at the Candoro Marble Company, was Knoxville-based A.G. Baumann.[158] The foundation and exterior doorways of this well-preserved building (now used as a bank and office building, with a small branch post office accessible by a side entrance) are a slightly darker but complementary shade of polished granite. The dramatic lobby features an

[158] Knox County Public Library, McClung Historical Collection, Craig/Candoro Papers, Candoro Marble Company Cash Book, 1914-1918. This book includes pages titled "Sawing" 1928-1941. From January to April 1933, all sawing done at the Candoro mill was for the Knoxville Post Office.

unusual and beautiful combination of Tennessee gray and greenish red decorative marbles with a floor pattern composed of Tennessee pink and brown variegated marble. The building's large exterior decorative eagles, a common symbol in the federal architecture of this period, were carved by local artisan Albert Milani, who was employed for many years at the Candoro Marble mill.

Another building of the same period and very similar design is Chattanooga's Federal Post Office and Court House, by local architect Reuben H. Hunt, which is faced with white Cherokee Marble from Georgia. Hunt chose colorful marbles for the interior, including Tennessee dark pink, Vermont green serpentine, and a warm-toned yellow marble, with terrazzo for the floors.

Many other examples of federal buildings from this period are still extant, and reports of the marvelous materials and techniques employed on these projects surface regularly in media outlets.[159] Buildings as far away as California obtained Tennessee marble for their interiors. The Sacramento Federal Building, constructed during the same years as the three Tennessee buildings, was a Beaux-Arts design by California architects Leonard Starks and Edward Flanders.[160] Starks's Beaux-Arts credentials came from having worked as an apprentice architect for Arthur Brown, Jr. and, possibly through Brown (one of the architects of the San Francisco City Hall), as a designer during the 1915 Panama Pacific Exposition. It is interesting to note in

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[159] When I began my research on Tennessee marble, I set up a Google™ alert for "Tennessee Marble" and have received hundreds of links to articles, advertisements, and news stories.

[160] U.S. Post Office, Courthouse and Federal Building, Sacramento, National Register of Historic Places, listed 1980.

this building the use of modern manufactured products combined with traditional building materials. The doorways of the building, which sits on a foundation of smooth, gray granite, were cast terra cotta and its brick façade was covered with "granitex," a terracotta imitation of rusticated granite. There are terrazzo floors and the interior walls are lined with Tennessee pink marble, a gold-colored marble from Utah, and Tennessee brown marble wainscoting. One wonders whether the materials contracts were locally handled or whether the network of suppliers that had been in place at the height of the Beaux-Arts era was still able to furnish a variety of marbles to meet the demand of these showplace buildings.

While the John M. Ross Company was obtaining high-profile commissions in New York City, other Knoxville companies, including Frank S. Mead's Ross-Republic Company, and John J. Craig and his affiliates also did very well during these early decades of the twentieth century.[161] The Craig Company acquired some of the older quarries in Knox County and opened a promising vein of marble in Blount County, where John J. Craig and his partners in the Great Southern Marble Company had been leasing quarry land as early as 1888. With the opening of the Marmor Quarry near Friendsville in 1896, the John J. Craig Company began a string of quarry and mill operations in Blount County that would ultimately expand to six quarries.[162]

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[161] With the exception of Craig/Candoro company papers on deposit at the Knox County Public Library, McClung Historical Collection, and a recorded slide lecture by Barksdale Jones, a descendant of the founder of Gray-Knox Marble Company, which has been placed on deposit in the McClung Historical Collection, no business records for these companies are known to exist.

[162] Burns, 238.

The Craig Company built a tram road to connect their main quarry to what was then the Marietta and North Georgia Railroad, soon to become part of the L&N system, in 1902. Another of their affiliates, the Tennessee Producers Marble Company, became active in Blount County in 1907. The John J. Craig Company, alone and in partnership with other Knoxville marble firms, would become the major producers of Blount County marble. A cash book from 1909-1912 shows shipments via railroad to locations all around the United States, including Chicago, Cleveland, Milwaukee, Cambridge, Massachusetts, Mobile, New York City, Houston, St. Louis, San Francisco. The majority of this cargo went out on the L&N Railroad.[163]

One of the Craig Company's most important partnerships, Candoro, a centralized marble-milling and exporting firm, was created by a group of Knoxville businessmen in 1914, on property next to the Vestal Lumber Company, with its already extant south Knoxville railroad spur. Candoro, with John Craig as the primary partner, grew to become a leader in the marble finishing industry. The company took its name from its principal owners: John J. **C**raig, F.C. **An**derson, W.J.**Do**naldson, S.A. **Ro**dgers. Listed as a salaried employee in the John Craig Company records, prior to the founding of Candoro, was another industry patriarch, J.B. Jones. Jones, who appears to have been a sales representative for the company from 1904-1910, owned stock by 1916, which he sold back to Craig family members in 1941. He also owned quarry lands in Blount County, and also in Grainger County,

[163] Knox County Public Library, McClung Historical Collection, Craig/Candoro Papers, Cash Book, 1909-1912. Candoro records and deeds also show that in 1923, the Candoro company contracted with the Southern Railway to lay track to the Victoria Quarry, a property they had obtained in the Boyd's Bridge area of Knox County.

near Thorn Hill, Tennessee, traditionally the source of a dark gray marble, the closest that Tennessee has to black. Jones would later be one of the founders of the Gray-Knox Marble Company, which ran an enormous milling operation on Sutherland Avenue in Knoxville, marketing both Georgia and Alabama marble. His son, Barksdale, also an experienced marble man, oversaw such important projects as the East front extension of the United States Capitol, and recorded the marble finish work done by the firm for the United States Supreme Court in 1935.[164]

After the exuberance of the expansive 1910s and 1920s, large architectural projects of the type that demanded prestige materials became fewer and fewer. New building materials such as cast concrete slabs and glass window walls came into use with international modernism, and decorative carving of architectural detail began to be a lost art.

When representatives of the Andrew Mellon Foundation came calling in Knoxville in 1936 in search of a large quantity of Tennessee marble for the planned National Gallery of Art, their aim was to convince the most prominent of the Knoxville industry owners to work together, re-opening closed quarries if necessary. Their politically powerful client hoped to endow an art gallery filled with an encyclopedic collection of western art as a gift to a nation in need of a morale boost. The new National Gallery was intended to emulate earlier models of individual moral and corporate behavior from Mellon's earlier peers, like Carnegie,

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[164] Knox County Public Library, McClung Research Collection, Barksdale Jones, former President, Gray-Knox Marble, recorded talk with accompanying slides, ca. 2004, on deposit by Finnbar Saunders and Sonja Jones.

Morgan, and Hill, all beneficiaries of the American free enterprise system, like the Mellon family dynasty. Not surprisingly, the architect chosen for the project, John Russell Pope, a graduate of Columbia University and the Ècole des Beaux-Arts, was a latter-day exponent of the American Renaissance. Trained in the offices of McKim, Mead & White, Pope had recently completed the renovation of Henry Clay Frick's home into a public museum. The long-standing New York construction firm, Marc Eidlitz, founded by the brother of architect C. Leopold Eidlitz, had worked with him to transform the 1913-14 Carrère & Hastings mansion.[165] For the new national gallery, Pope and Mellon took the Morgan Library as their model. Intent on adhering to traditional models by now becoming iconic, they chose Tennessee marble for the new art gallery, and enlisted the Eidlitz firm to ensure quality craftsmanship in building construction.[166]

Representatives of the Mellon Foundation, the office of John Russell Pope, and the Eidlitz Company made exploratory visits to Knoxville in 1936. Young architect Malcolm Rice, a graduate of Yale School of Architecture, had already been dispatched by the Pope firm to investigate the quarries. Rice's stroke of genius was the creation of a scheme using different shades of marble in ascending layers from

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[165] "From Mansion to Museum: The Frick Collection Celebrates Seventy-Five Years" http://www.frick.org/exhibitions/75th/index.htm [accessed 5 April 2011]

[166] Years later, Malcolm Rice, an architect originally employed by the offices of John Russell Pope, who had been the primary marble consultant for the original gallery building, was called out of retirement in Knoxville to devise a plan for Tennessee marble use on I.M. Pei's East Building of the National Gallery. National Gallery of Art, Gallery Archives, Records of I.M. Pei & Partners, Correspondence from Malcolm Rice, marble consultant, 22 March 1973.

dark to light, interweaving them to achieve a subtle blend. This made it possible for the builders to use marbles from different quarries and still achieve the appearance of a seamless façade for the monumental structure. The Mellon team came to agreement in Knoxville on 1 October 1937 with the officers of the Gray-Knox Marble Company, the Candoro firm, the John J. Craig Marble Company, and Tennessee Marble Incorporated, who agreed to work together in supplying marble for the building.[167] Representing the famous "Ross pink" marble brand, the pink marbles mined by the Ross and Ross-Republic companies, was Alexander Harris, Tennessee Marble, Incorporated.[168] John M. Ross, in his late seventies, was already retired, and Frank S. Mead, who had been ill for some time, died that same spring.[169]

The resulting museum, one of the last major American Renaissance public monuments, was to be as solid and impressive as possible. The design was a restrained neoclassical style, very much like J.P. Morgan's library, with the Tennessee marble laid in blocks as dimensional stone. As at the Morgan Library and Morgan Bank, its creators could boast that it would last five hundred years.

While much of the work on this project was done at the Candoro mill, the mills of Gray-Knox and Tennessee Marble also crafted elements, and all three

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[167]National Gallery of Art, Gallery Archives, Records of the A.W. Mellon Educational and Charitable Trust Construction Files.

[168]Both of these quarries, now called Ross's and Mead's, are on the property of Ijams Nature Center, on the south side of the Tennessee River in the Island Home section of Knoxville.

[169] "Frank S. Mead, Marble Plant Developer, Dies," *Knoxville News Sentinel* 13 April 1936; "Obituary: Mead, Frank Seymour" *Knoxville Journal* 13 April 1936.

companies provided quarry stone. The building (figure 20) completed in 1941, featured a demonstration of excellence in marble craftsmanship that would come to be seen as a rare accomplishment in the years ahead.

Figure 19. John Russell Pope, National Gallery of Art, 1941. Courtesy Knox County Public Library, McClung Historical Collection, Barksdale Jones images.

In addition to the gigantic exterior turned column drums, there were three enormous lathe-turned marble fountains also created in Knoxville and shipped by rail to be assembled on site (figure 21). Two of the fountains were of dark pink marble; they stand today on either side of the mall entrance to the building.

Figure 20. Tennessee pink marble fountain being assembled on site, National Gallery of Art, circa 1940. Courtesy Knox County Public Library, McClung Historical Collection, Barksdale Jones images.

The special dark gray marble fountain in the building rotunda, which was carved by master artisan Levio Antonio Pellegrinelli, was also shipped by rail from Knoxville to Washington, D.C.[170]

A fitting tribute to the enduring legacy of Tennessee marble was its use in the ultra-modern styled addition created for the National Gallery of Art (figure 22) in the mid 1970s. While there are no classicizing details to be found, the harmony between the older and newer gallery buildings rests almost solely on the matching coloration of exterior stone—that of the 1940 building having retained its original

[170] Pellegrinelli, who was a graduate of the Carrara Academy of Carving Art, had immigrated to Boston in 1912. He moved to Knoxville in 1919 and worked there for the different marble firms throughout his career. "Noted Sculptor, A Knoxvillian 60 Years, Dies," *Knoxville Journal* 31 May 1982.

tone so well that visual agreement between the two buildings, even as disparate in style as they are, was still possible.

Figure 21. Aerial view, National Gallery of Art, original 1941 John Russell Pope (west) building, foreground, with 1978 I.M. Pei (east) building behind. Both buildings of Tennessee marble from Knox and Blount County quarries. Courtesy Knox County Public Library, McClung Historical Collection, Barksdale Jones images.

An agreement was reached in 1973 between Candoro, the John J. Craig Company, and the Georgia Marble Company (which had absorbed both Tennessee Marble Incorporated and Gray-Knox Marble) to provide Tennessee pink marble for the exterior cladding. Malcolm Rice, who had remained in Knoxville following the

original National Gallery of Art's completion, and whose daughter Joan was married to the great grandson of John J. Craig, came out of retirement to assist the I.M. Pei firm with sourcing and matching the panels of Tennessee marble.[171] Rice's grandsons, John and Jeff Craig, oversaw this massive project, working under the watchful eye and professional guidance of Rice, whose detailed schematic enabled them to mark and tag marble slabs from seven different quarries to be assembled by the contractor on the job site in Washington, D.C. This second and even more complex marble-matching design scheme also took longer to build than the first. Rice constructed a model wall at the Candoro mill in Knoxville so Pei and representatives from the Gallery could examine the proposed result in person. The marble came from six quarries near Friendsville, and one in Luttrell, and was turned into finished product at two mills: Candoro and the old Tennessee Marble mill, which were then under the auspices of the Georgia Marble Company. It was completed in 1978.[172] Today, Tennessee marble is being quarried only by the

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[171]National Gallery of Art, Gallery Archives, Records of the A.W. Mellon Educational and Charitable Trust Construction Files.

[172] The Craig family's multi-generational marble legacy ended with the sale of the Candoro Marble Company in 1980 to John de Giulio, who renamed the business Standard Art Marble & Tile, replaced many of the workers with an automated polishing line, and dismantled the company relationship with the stone and marble workers union. DeGiulio closed the company for good in 1986. Jeff Craig, interview with author, 14 September 2009.

Tennessee Marble Company, which is headquartered in Friendsville, Tennessee, and still has access to Knoxville and vicinity quarries.[173]

The story of Tennessee marble is one of continuity. It speaks about belief in the power and importance, both literal and symbolic, of permanent materials. Through decades of use, the marble—and those who worked it and promoted it—benefitted from political and private patronage. It was often a source of local, regional, and national pride. From time to time, the marble was also a tool of political and economic interests. Tennessee marble's cyclical revival as a meaningful choice for civic architecture, in such buildings as the United States Capitol Visitor's Center (2008), the East Tennessee History Center (2005), and the Howard Baker Center for Public Policy at the University of Tennessee (2008), reflect the continuing need, on the part of both sponsors and patrons, for public institutions that represent stability and permanence. And, perhaps also, a particularly American desire to convert the country's abundant resources into tangible reminders of our historical accomplishments.

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[173] Under the leadership of Monica Gawet, whose family has been in marble and granite business in Rutland, Vermont, for more than one hundred years, the Tennessee Marble Company, founded in 1993, acquired its last-surviving competitor, Tennessee Valley Marble Company, in 2007. Prior to the friendly acquisition, the two companies had worked in partnership to furnish marble for the United States Capitol Visitor's Center.

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