Introduction

ROBERT MILLS, CARTOGRAPHER

by Gene Waddell

In 1826 when Robert Mills presented the South Carolina Senate with a copy of his *Atlas,* it passed a resolution which praised "with just feelings of national pride and individual admiration, the zeal, industry, enterprize and skill of the author. . . . "[1] He had produced the first atlas of an American state,[2] and, as he later noted, South Carolina was "now acknowledged to be in advance of her Sister states. . . . "[3]

As a cartographer, Mills took justifiable pride in his work and was deserving of the Senate's praise. He had "devoted all his time, talents, and means" for four years to complete the *Atlas* and an accompanying volume of *Statistics.*[4] However, several dozen other individuals had been working since 1815 to assemble the information that Mills utilized to create the *Atlas.* At least twenty surveyors had prepared careful surveys of every district in the State by 1821, and John Wilson, the former Civil and Military Engineer, had made substantial revisions in these surveys to use them as a basis for his 1822 Map of the State. Credit for the *Atlas* belongs, thus, to many individuals, but as will be shown, the credit belongs to no one more than to Mills.

George Blackburn proposed a map of the State in 1815 because he needed a job. A year earlier he had been Professor of Mathematics and Astronomy at South Carolina College, but he resigned when its trustees refused to give him a vote of confidence. His numerous suspensions of students and his generally excessive discipline had so provoked the entire student body that on 8 February, 1814, he was burned in effigy, his house was damaged with brickbats, and the militia had to be called out to quell a full-scale riot. He nevertheless was allowed to continue teaching until 30 November.[5]

On 2 December, 1815, in a handsomely printed petition, Blackburn defended himself as a teacher and recommended himself for "a great work; the publick calls for a good map of our state. . . . " He noted that South Carolina was "the only State, east of the Mountains, that has not a map, constructed upon a large scale, and calculated to answer all the topographical purposes of the geographer, the historian, the legislator and the states man." He outlined all of the steps that would be necessary to prepare such a map and presented his qualifications. He suggested that existing plats and maps could supply much of the needed information if free access were provided to them. He estimated that one year would be needed for astronomical observations and two or three years for the whole plan.[6]

Although Blackburn impressed the Legislature with the need for a map, he did not convince them that he was the person to undertake it. The committee which considered his proposal reported that such a map would have "advantages . . . so numerous and universally admitted as to render unnecessary a particular detail," but it mentioned advantages especially for defense, commerce, and public works. The committee proposed an appropriation of five thousand dollars for each of two or three years, but instead of placing Blackburn in charge, it requested the Governor to superintend the project and to appoint a fit person to undertake it.[7]

The Governor, David R. Williams, decided to give Blackburn one year to accomplish as much as he could and to demonstrate "a just regard to economy of money and time." On 14 February, 1816, he wrote Blackburn expressing confidence in his ability, but warning him that if he failed to follow instructions, "I shall not hesitate to dismiss you from the service of the State." "Thunder and Lightening" Williams had a temperament not unlike Blackburn's, and he imposed similarly rigid discipline. Blackburn was required to submit week-

ly transcriptions of all his notes. Williams allowed that astronomical observations could be made "as may be deemed necessary," but he stipulated that landmarks were to be carefully recorded. He instructed him to traverse the entire state with an odometer attached to his vehicle and to use it

> to mark all the water courses that intersect your route; all the ferries, bridges & c. that you cross, together with all the noted points such as cities, towns, villages & court houses upon these routes; and the residences of such land holders, as may appear upon the map without incumberance. also, extensive mills, manufacturies & Iron works.

He also instructed him to descend rivers and note the location of falls and other obstructions and to propose locations for canals.[8]

From March through August, Blackburn travelled throughout the State. His journal and reports are not known to survive, but his determinations of latitude were printed and enable his route to be reconstructed.[9] His observations were later considered accurate,[10] but they were insufficient to convince the Legislature that he could prepare the map he had proposed. In December, when it met again, he was not rehired.

Presumably, Blackburn had done too much of what he had considered necessary for the first year of the project; he had confined himself too exclusively to astronomy and even then to the determination of only latitude. He must not have received the equipment necessary to accurately determine longitude, and his perambulations must not have provided results that inspired confidence.

On 19 December the Legislature asked the Governor to appoint surveyors to prepare district maps which could be used for compiling an accurate map of the State. The report of a joint committee of both houses called for maps to be based on actual survey, to have a scale of a mile to half-an-inch, and to indicate

> . . . the election districts and parishes, the roads with their courses and distances, the towns, villages and taverns, the ferries, bridges, manufactures, mines and mineral springs, the rivers and creeks, with their courses, rapids, falls, and all obstructions to the navigation, the variations in the face of the country, shewing the extent of the swamps, of the level, hilly and mountain land.

This information was needed immediately for improvements to navigation and for road building, and clearly, one man could not do all of the necessary work in one or two more years, as Blackburn had stated in his proposal.[11]

During 1817, the next Governor, Andrew Pickens, Jr., conscientiously visited every district to seek the best qualified surveyors. He informed the Legislature at its next session on 28 November, 1817, that he had made contracts for surveys of all but a few districts and that the surveyors understood they were not to be paid until their completed maps had been approved. He avoided responsibility for the quality of his appointments by telling the Legislature that it had to decide when a payment should be made. Some of the maps, he added, would probably be submitted within a month for their "inspection and approbation."[12]

Pickens' recommendation that no surveyor be paid until his work was approved had already not been followed. Three surveyors had been given advances in 1817: Thomas Anderson for Edgefield District in May; William Robertson for Abbeville in July; and Stephen H. Boykin for Kershaw and Lancaster in August.

By December, 1817, only Robertson of the three had fulfilled his contract. After a comparison with his journal, the Joint Committee on the Map called his survey "remarkably correct" and approved payment for it.[13] Two surveys by other surveyors were submitted and not approved. One was by Col. John Lowery of Chesterfield, and the Committee noted that the water "courses are not laid down with sufficient minuteness." It was returned to him and not approved until two years later. The other survey was of Marlborough District, one of only two of the *Atlas* maps which does not carry the name of a surveyor. It was evidently not approved until

March 1818, and judging from the records of payment, the surveyor was probably Thomas Harllee.

During the first year of the surveys, some of the surveyors must have been charged for the use of plats and other public documents needed to prepare accurate maps. In December, 1817, the Legislature passed an act authorizing anyone employed on the project to make free use of any information in the offices of the Secretary of State, the Surveyor General, and the Register of Mesne Conveyance. After a year of experience, the Legislature also decided to accept the recommendation of Major John Wilson, elected Civil and Military Engineer at the same session, to double the size of the district maps by changing the scale to one mile to the inch, thus enabling more detail to be represented more readily.[14]

No other maps were approved until December, 1818, when ten additional districts were submitted. Nine of the ten were approved and the surveyors paid; one was not approved until the following year.[15]

The lower coast proved to be a special problem. Evidently, no one was willing to accept a contract price for either the whole of Charleston or Beaufort Districts, not only the largest two districts in the State, but also the two which are most broken into islands. Charles Vignoles and Henry Ravenel worked separately on individual parishes and were paid a salary as well as a substantial sum upon the completion of their work.

During 1819, the maps of six districts were approved, two of which had been previously rejected.[16] Seven of the eight maps which remained to be completed were approved in 1820, leaving only Sumter district to be resurveyed.[17] Sumter had been begun by one surveyor, who sold his contract to another surveyor, whose work proved to be inadequate. Stephen H. Boykin, who had turned in exceptionally detailed maps of Kershaw and Lancaster Districts, was intrusted with the production of another map to enable the manuscript for the Map of the State to be completed. He worked during the winter of 1820 and by 24 March, 1821, had submitted an approved map.

Altogether, if two attributions are correct, twenty surveyors worked on the twenty-eight district surveys. Thirteen surveyors prepared a map of one district each. One surveyor, Henry Ravenel, surveyed a portion of a district; another surveyor, Charles Vignoles, completed the remainder of the district Ravenel had worked on and also surveyed the whole of an additional district. Two surveyors, Thomas Anderson and John Lowery, prepared two surveys; and three surveyors, Stephen H. Boykin, Marmaduke Coate, and Thomas Harllee, prepared three surveys.

The compensation for preparing the surveys varied substantially. In many cases, individual surveyors must have suggested the price to be paid without any knowledge of what others were receiving because some were paid only a third as much per square mile as others. The terrain seems to have made little difference; the surveyor for the mountainous district of Pendleton was paid only 98¢ per square mile while the surveyor of Union was paid $1.76. For the excellent map of Sumter that Stephen H. Boykin agreed to prepare at the last minute, he received only 66¢ per square mile.[18]

Although they were not consistently better paid, four surveyors were significantly more professional than the others, especially as mapmakers: Charles Vignoles, William Hemingway, Stephen H. Boykin, and Richard Thompson. The surveys by others required more additions and corrections and in general were closer in appearance to plats than to maps. While nearly all of the surviving surveys have a title, sometimes an embellished one, only five have a cartouche. Most are signed, but only four are dated. About a third have compass roses, legends, and scales (rarely elaborate ones). Borders were even less frequently used. While many of these features were becoming unfashionable (and, thus, are not included in the *Atlas*), their presence in the surveys generally coincides with more overall competence. With only a few exceptions, though, the level of competence of the surveyors at surveying was extremely high. All but one of twenty-nine surveys were eventually accepted, and only two others are known to have been returned for

revisions. On all of the eighteen surviving surveys,[19] the roads have been clearly drawn from actual measurement of the distances and angles. Not all features were surveyed, and many of the maps have only wavy lines for watercourses. Most have little line quality, and when roads and waterways are depicted with single lines of about the same thickness, neither stands out distinctly. The majority of the surveys have names written randomly in all directions and written in script of irregular size (instead of uniformly sized printing written as nearly horizontal as possible). A great deal of work remained for both Wilson and Mills.

Even so, the men who walked the tens of thousands of square miles of the districts and who made the Map of the State and the *Atlas* possible deserve more than passing mention. The accomplishment of each man will be considered separately:

Thomas Anderson, Deputy Surveyor, prepared the surveys of Edgefield and Barnwell Districts. Both of his manuscript maps have survived and are signed by him,[20] and he is credited with having made both surveys in the *Atlas.* He was given an advance in May, 1817, for the Edgefield map and received a final payment for it in December, 1818.[21] He was paid a total of $1,250 for surveying the 1,702 square miles of the district. His manuscript is highly exceptional in being watercolored with blue for water, red for roads, and yellow for swamps. He was paid an additional $1,000 on 26 August, 1819, for his map of Barnwell (1,440 square miles). It is unusually detailed in that it often shows approximate boundaries of individual land holding; it was clearly based in part upon plats.

The Edgefield map was probably begun before the Legislature approved a change in scale because its scale is two miles to the inch (the scale of the *Atlas* maps). The Barnwell map has the new scale of one mile to the inch and so is twice as large as the published version and had to be reduced for it.

In 1820 Anderson was probably a resident of Edgefield District, where two Thomases are listed in the Census of that year. He, like the majority of the surveyors, possessed a firsthand knowledge of the regions he surveyed.

Charles Boyd, Deputy Surveyor, prepared a survey of Chester District, where he probably lived in 1820. His manuscript is dated 30 November, 1818,[22] and he was paid $1,000 the following month. When Gordon Moore soon afterwards presented a survey of York, it became clear that the boundary between the districts was two miles too long on one of the surveys. A resurvey exonerated Moore. Boyd had originally been hired by Governor Pickens to survey both of these districts, and if he had, his mistake might have gone undetected until he had been paid for both. Boyd had, in fact, begun the York survey, but Pickens directed him to desist. Boyd complained to the Legislature that his contract called for surveying both districts for $2,000 and that he would have charged $1,200 for Chester alone. He asked for an additional payment of $200,[23] but his claim was unjustified. Chester has 566 square miles and York 693, even disregarding the inadequacy of his work. The Legislature ignored his petition.

Stephen H. Boykin prepared maps of Kershaw, Lancaster, and Sumter Districts.[24] He worked on the adjacent districts of Kershaw and Lancaster at the same time, receiving a $200 advance for both in August, 1817, and an $1,800 payment for both on 21 December, 1820. He prepared the map of Sumter District between 20 November, 1820 (when John Lowery petitioned for an additional payment for his map of Sumter), and 28 August, 1821 (when he, Boykin, received a payment of $1,100).

In December, 1821, the Senate wanted to know "whether more than one Surveyor was employed to make a Survey of the District of Sumter & if so whether both of them have been paid & the reason why that course was pursued." The Committee on the Map reported that Governor Pickens had employed Daniel Dubose of Sumter District to prepare the map originally, but Dubose had delayed so long that the next Governor, Geddes, had hired Lowery to make one. Lowery's survey was approved by James M. Elford (the professor who replaced Blackburn), and Lowery was paid in full. Subsequently, the Legislature gave the Board of Public Works authority over the map project, and the Board rejected the map, stat-

ing that it was "defective & incorrect & can not be made to answer the purpose."[25] Boykin was then called upon so that a dependable survey could be produced in as short a time as possible.

Of Boykin's three maps, only the one of Sumter is known to survive. He must have made good use of plats to be able to compile so detailed a map of so large an area (1,672 square miles) in so short a time. Although his map of Sumter does not resemble a printed map as closely as the maps by Vignoles, Hemingway, and Thompson, its unusual clarity and minute depiction of watercourses make it one of the best submissions and one that required the least revision for use in the *Atlas*.

Benjamin Busbee received $1,400 for work on the Map of the State on 11 December, 1818. The voucher has "Benjamin Bugbee," and the *Atlas* plate of Orangeburgh District has "B. Busby," but the 1820 Census has only several Busbees, a form which survives. No manuscript map for this district is known to exist.

Marmaduke Coate surveyed Lexington, Newberry, and Richland Districts. One thousand dollars was paid for the Lexington survey in August, 1819, and although the manuscript is unsigned, the 1821 printed version has his full name, the *Atlas* plate has "M. Coate," and the inscriptions on the manuscript are in the same hand as his large-scale survey of Richland. The Lexington survey includes a street plan of Granby that is not reproduced in the *Atlas*.[26] The 1821 edition was handsomely engraved by James Wood and printed by Wright and Smith.[27] This version is more detailed than the *Atlas* plate, including distances between each change in road direction and additional placenames.

Coate was paid $800 for the Newberry map on 25 November, 1819. The manuscript is not known to survive, nor is a copy of the 1821 version that was also printed by Wright and Smith.

On 28 April, 1820, Coate received $1,200 for the Richland survey. It has a minutely detailed plan of Columbia's streets that is not reproduced in the *Atlas*.[28] This survey and the other two required relatively little revision to be included in the *Atlas*.

Henry Gray was paid $700 on 18 December, 1818, for the map of Laurens District; this amount was near the mean of $1.00 per square mile since this district contains 720 square miles. No manuscript map is known to survive.

John Harllee (c. 1790-1870) signed a receipt for $700 on 16 December, 1819, and it is marked "for the map of the State for Williamsburg District." The manuscript of this district also has "Jno. Harllee."[29] The *Atlas* map incorrectly has "I. Harlee." John was the son of Thomas Harllee, the surveyor who will be considered next, and he was also the grandson of a surveyor; as in other professions during the 18th and early 19th centuries, sons still frequently followed the example of their fathers.[30] John was about thirty at the time, and he had probably not studied with any surveyor except his father because his manuscript, although probably accurate, has the same crude embellishments such as scribbled lines and muddy watercolors to indicate marshes.

Thomas Harllee (c. 1767-1827) was an experienced surveyor and the son of a surveyor. Notably, three of his sons were surveyors (David S. and Peter, as well as John). Although he and John were competent surveyors, neither was a cartographer, as is evident from their manuscript surveys.

Thomas was paid a total of $2,800 in 1818. Neither of the two payments made that year indicate which districts he was being paid for, but the amount of money makes it probable that he made surveys of three districts. In the *Atlas* "Thos. Harlee" is credited on the Marion plate, which is dated 1818. The Horry plate has only "Harlee," undoubtedly meaning him and not John (who received a total of only $700).[31] Since Thomas was a resident of Marion and he was asked to do the adjacent Horry (and his son did the adjacent Williamsburg), the third survey he did probably followed the general pattern of Governor Pickens' choices and was either for the adjacent district of Marlborough or Darlington, the only two *Atlas* maps which are anonymous. Darlington is less likely because the manuscript for it is in a different hand and style; the Marlborough manuscript is not known to survive and so cannot be compared, but it was submitted and not

approved in December, 1817, and he was paid $700 in March, 1818. Furthermore, no other payment seems applicable for this district so it can be safely attributed to him.

Thomas Harllee was a prominent citizen of Marion, and he served as a State legislator from 1802-1810. He was Clerk of Court and also Ordinary from 1810-1826. He left a large estate, and the inventory of it includes a "surveying compass & Chain" valued at $10.00.

William Hemingway surveyed Georgetown District, and in December, 1820, the Legislature appropriated $1,722 for his work.[32] He is listed as a resident of Georgetown in the 1820 Census, and he died that year on 18 November.[33] An entry in the "Journal of General Peter Horry" for 1 October, 1812, suggests that he employed slaves to assist in his work; the General "sent Scipio & Hardtime . . . to Carry the Chain for Mr. Hemingway the Surveyor. . . . "[34]

John Lowery probably surveyed three districts, but only the Chesterfield plate is definitely based on a survey by him. He probably prepared the Darlington survey as well.[35] His Sumter survey was not used. Lowery was paid $700 for Chesterfield in May, 1819, but he had initially submitted it for approval a year-and-a-half earlier, in December, 1817.[36] He was paid $1,000 for his Sumter map on 21 June, 1820, but as has been noted, Stephen H. Boykin had to make an entirely new survey and map. His surviving survey of Chesterfield has single ink lines for both roads and creeks, and it omits numerous names that appear in the *Atlas.*

On 20 November, 1820, before his Sumter survey was rejected, Col. Lowery petitioned the Legislature for further compensation. He said that when Governor Pickens had asked him to undertake this survey, he agreed to, but out of regard to Daniel Dubose, who had been asked by Governor Geddes to do it, he called on Dubose and explained the situation. Dubose was dissatisfied because he had already done part of the district. Lowerey wrote, "I wished at the time I had never undertaken the Job." To satisfy Dubose, Lowery gave him $400 out of the $1,000 he eventually received. The remainder, after he deducted this payment and his expenses, was "but a trifle for the laborious toilsome job I have done for the State."[37] He received nothing more.

The unsigned Darlington survey may be by Lowery. Certainly, it resembles his Chesterfield survey more closely than any of the other sixteen surviving surveys, but there are enough differences to make an attribution to him questionable. The chief problem with an attribution is that there is no mention of another payment to him that could be for Darlington. Since there seems to be no payment assignable to anyone for Darlington, he may have done the survey and not been paid for it after his Sumter map proved to be unusable.

Gordon Moore had completed his survey of York by December, 1818, but through no fault of his own, he was not paid until a full year later. He petitioned the Legislature for additional work that he was required to do and for interest, and he was compensated. His petition states that he was to have been paid $1,000 upon completion of a survey and that he had finished before the one of Chester was approved, but illness prevented him from submitting it for approval until one or two days later. The Civil and Military Engineer, Wilson, had ordered him to resurvey the boundary between Chester and York because upon comparing the two surveys, "it was found that there was a difference of two miles." His resurvey satisfied Wilson "that his first measurement was strictly correct" and that the error had been made by Charles Boyd. The Legislature voted him $100 for the extra work and $70 in interest.[38]

Henry Edmund Ravenel (1795-1859) was President of the Union Bank of Charleston during much of his adult life, but as a young man he practiced surveying.[39] He was only twenty-three when he received his first payment for work on the district surveys. Altogether, he received $3,800 between April, 1819, and December, 1821; he was paid four hundred dollars as a quarterly salary until January, 1820, and then $500 the following April, $1,600 on the approval of his work in January, 1820, and a final payment of $100 in December of 1821. The payments for 1820 and 1821 are all marked for a survey and map of St.

Helena Parish, the portion of Beaufort District that includes St. Helena, Ladies, and Port Royal Islands. Vignoles is credited with the remainder of this district on vouchers and on the manuscript map. The *Atlas* credits Ravenel with work on the map of Charleston District, and he may have worked his first nine months in that district, but since the manuscript map of Charleston says that it was prepared entirely by Vignoles, Ravenel more likely spent a full year-and-a-half on St. Helena Parish. If the available information is complete, he received 38 percent of the money paid for the Beaufort and Charleston district maps and a survey of the Savannah River, yet he surveyed less than one-fifth of the total land area.

William Robertson completed, as has been noted, the first district map that was approved. He received an advance of $500 for Abbeville in July, 1817, and he was paid a balance of $650 in December, 1817. His "remarkabley correct" survey is missing.

Samuel A. Ruddock surveyed Colleton District and was paid a total of $1,200. He received a $100 advance on 26 April, 1820, and the balance on 10 June, 1820; the survey is dated the day before the final payment.[40] He was living in Charleston District in 1820 when the Census was taken. On 21 August, 1821, he was paid $200 for different work, this time "for reducing and copying Maps of Georgetown and Kershaw districts, and the survey of the State Line of 1772."

His own map of Colleton reflects a flamboyant personality that got him into trouble. It is the only one of the eighteen surviving surveys which has irrelevant decorations added, including pasted-on woodcuts of an American eagle and two ships. During the heated campaign for the United States House in 1820, with Joel Poinsett, Chairman of the Board of Public Works, running against John Gettys, the former Governor, another politician named James Hamilton, who was later a governor himself, got angry enough with Ruddock to tweak his nose.[41]

George Salmon surveyed Greenville district and received $800 on 19 April, 1820. He must have been one of the State's best surveyors to have been selected to run out a portion of its boundary with North Carolina in 1813-1815.[42] His manuscript map is not known to have survived.

Robert Stribling was paid $1,800 for the map of Pendleton on 5 December, 1818;[43] the Atlas plate incorrectly has "Scribling." Pendleton was the third largest district in the State with 1,836 square miles, and it was by far the most mountainous, yet, as has been mentioned, he was paid substantially less than other surveyors were paid for less difficult surveys. His manuscript was carefully prepared except for the representation of mountains, which are conventionalized and not shown with variations in height, as they are on Wilson's 1822 map.

When Stribling's survey was approved, the Joint Committee on Internal Improvements, Maps, singled him out for praise, expressing "their great satisfaction and high approbation, not only of the accuracy and minuteness with which said map had been executed, but also of the style and elegance of the execution." A year later, in 1819, after other surveyors had been paid better than he had, he petitioned for an additional sum, saying that he had had "no precident" to determine a fair price when he agreed to do the work for a set price. He belived that he deserved at least twice what he had received, but he knew, as he told the Legislature, that he was "at your mercy."[44] He received no further compensation.

John Allen Tharp surveyed Fairfield and for his work received $1,150 on 4 December, 1819. His original manuscript is clearer than most of the others because he differentiated waterways with watercolors and roads with dotted lines.[45]

Richard Thompson was a resident of Spartanburg District and was one of the best surveyors, but he prepared only the map of Union District.[46] He was paid $950 on 11 December, 1818. His manuscript map and a version of it that was printed in 1821 both survive and were both made to the scale of two miles to one inch (indicating that he probably began his survey in 1816). This printed version follows the manuscript more closely than the *Atlas* plate, and while both the manuscript and the initial printing are excellent, they share

some common faults such as the inscription of placenames in random directions and the indication of a mountain with a blurred gray area. James Wood was paid for the engraving in April, 1821, and Wright & Smith for the printing one month later.[47]

Charles Blacker Vignoles (1793-1875) received $6,240 between 1818 and 1820 for surveying all of Charleston District, all of Beaufort except St. Helena Parish, and all of the Savannah River. He was eventually salaried at $2,000 per year (compared to $1,600 for Henry Ravenel and contracts of $1,000 for a year's work given to some other surveyors), and he also received a substantial balance when his maps were approved. In June, 1820, he received separate payments of $2,000 and $1,550, probably for completing the Charleston and Beaufort maps respectively.[48] The cartouche of his Charleston map reads, "Surveyed, Compiled, and Drawn by Charles Vignoles," which is specific enough to preclude any participation by Henry Ravenel, who is given equal credit on the *Atlas* plate.[49] Since Vignoles was an Englishman and a visitor in South Carolina and Ravenel was a resident of Charleston District and was a descendant of 17th Century emigrants, Ravenel may have been called upon to make additions and corrections after the manuscript was completed. The major changes between the manuscript and the *Atlas* plate, though, is in the addition of personal names that Mills could equally well have provided.

The Beaufort map reads "the Parishes of Saint Peter, Saint Lukes, Prince Williams Surveyed by Charles Vignoles and Saint Helena Surveyed by Henry Ravenel." The manuscript is in the same distinctive hand as the Charleston map and was clearly drawn by Vignoles.[50]

Vignoles later distinguished himself as a leading railroad engineer in several European countries. In 1869, he was elected President of the Institution of Civil Engineers in England.[51]

James Whitten prepared a map of his native "Spartanburgh" and received $800 for it on 7 December, 1818. His manuscript is a careful, clear map, but is somewhat cluttered by a large script.[52]

In addition to the district surveys, a new survey of Charleston was prepared to be an inset for the Map of the State. This was probably prepared by John Wilson himself because he was paid one thousand dollars in April, 1817, on the account of the Map, and he was City Surveyor of Charleston. Since he is known to have surveyed parts of the City personally and since he undoubtedly knew which earlier surveys were most reliable, his selection to prepare the inset would have been an obvious choice. The payment to him was made about eight months before the first district survey was approved and before he became Civil and Military Engineer.[53]

The act that was passed by the Legislature on 19 December, 1816, not only called for the Governor to appoint surveyors to prepare maps of each district, it also authorized him to appoint "a draftsman to form a map of the whole" and someone to make additional astronomical observations. Neither service was needed until the district surveys had been completed and were ready to be fitted together. Eventually, Wilson was the person chosen to draft the final version of the Map of the State, and he did most of the revision and compilation in 1820.[54] On 30 March he was paid one hundred dollars for reducing and copying the survey of Abbeville. Since the original manuscript survey of this district was the first one to be approved and since this is the first known reference to reductions, this payment is likely to be for the beginning of the preparation of the Map itself. In making subsequent reductions, he had the assistance of Mons. E. Paguenaud, Eugene Reilly, B. Pettival, and the surveyor Samuel Ruddock.[55]

The final responsibility for the Map was Wilson's, though, and it carries his name with as full a justification as the *Atlas* carries Mills's because both men performed the role of cartographer. Of the numerous problems that Wilson had to resolve, the most common was allowing for the distortion inevitable in reducing a spherical surface to a plane. To make uniform allowances, he needed accurate coordinates for all parts of the state. While Blackburn's observations were helpful and are acknowledged on the Map, additional observa-

tions had to be performed by James M. Elford, particularly to determine longitude. Latitude had never been a problem in the preparation of South Carolina maps, but as late as 1802, the map used as a frontispiece in John Drayton's *View of South Carolina* has noticable horizontal distortions. Elford made a new series of observations, and his results are preserved in a bound journal that is dated 27 November, 1820.[56] A third astronomer, Professor Wallace of South Carolina College, took advantage of an eclipse on 27 August, 1821, to determine more precisely the coordinates of Columbia.

On the day following the eclipse, Boykin was paid for completing the final district map. Two weeks later, John Wilson was paid $1,500 for himself and Henry S. Tanner, the Philadelphia printer and publisher who was selected to engrave the Map. Tanner had established a reputation for large scale maps (and atlases), and he was probably chosen over the South Carolina printers who had already prepared district maps because of his experience and the size of his presses. Wilson went to Philadelphia to supervise the engraving and printing during the fall of 1821, and an initial press run of 50 copies was printed in 1821 (although the map carries a copyright date of 10 April, 1822). On 2 April, 1822, Tanner contracted to print an additional twenty-five hundred copies. This second printing had been completed by December, 1822.[57]

The total cost of the State map was $65,520.53.[58] For 2,550 copies, the cost per copy was $25.69, much more than a copy could have been sold for. The Legislature hoped to recover the full cost by eventually printing 5,000 more copies and selling all of them for $10.00 each. Two years later, sales had been so miserable that the Legislature considered it "indispensably necessary" to reduce the price to $5.00, and another printing was out of the question.[59] Initially, the Legislature had authorized agents in only two South Carolina cities, Charleston and Columbia; now agents were sought for "any other place within the state."[60] The poor sales were blamed on cotton prices, which were exceptionally low, but the map was impractically large as well. Copies are nearly four by five feet, much too large to be consulted easily, especially while out of doors. Although Wilson's map was by far the most accurate one of every part of the State that had appeared, it sold so poorly that the Legislature had no interest in supporting the printing of more of the district surveys.

In 1818, three years before Wilson's map was first printed, he had been instructed to make copies of the district maps available as quickly as possible.[61] Copies were needed by road commissioners and canal builders for work that was in progress. Numerous small payments on the account for the map during 1819 were probably for preparing manuscript copies of the surveys. The demand must have increased for five district maps to have been printed in 1821. The printing had been in preparation for about a year. On 26 April, 20 June, and 8 December of 1820, James Wood was paid one hundred dollars for engraving, and in 1821 he received payments in February ($380) and on 17 April ($100), when there is a note that the payment is for engraving the maps of Union, Lexington, and York Districts. In March, 1821, Wright & Smith received $500 for printing these maps and also for printing plates. On 18 May, James R. Schenck received $206.40 for paper and for "publishing" the maps (probably for selling them since he was a dealer for the Map of the State and he also supplied printing plates). By 10 June, Wright and Smith had printed maps of Newberry and Fairfield Districts.[62]

If the engraving of district maps had continued, an atlas would have been an inevitable result, but one was probably not envisioned in 1817 when the scale of the surveys was doubled; as a result some of surveys with the revised scale of one mile to the inch are about the size of Wilson's Map of the State. The first known mention of an *Atlas* was in about November, 1821, when one was proposed in the "Report of the Board of Public Works, to the Legislature of South-Carolina, for the Year, 1821."[63] The Legislature did not take action, so the proposal was put forward in more detail one year later in the Board's 1822 report. This time, a specific estimate by a Parisian printer was presented for reproducing the twenty-three district maps that had not been printed.

The "whole expense" for printing and reducing the surveys was estimated at an unrealistically low total of $1,780 for five hundred copies.[64] Although more than enough money to pay for this project remained in unexpended funds from the final appropriation made for the Map of the State, the Legislature also took no action on this recommendation.

During the same session, in December of 1822, the Board of Public Works was abolished and a Superintendent of Public Works replaced it. Abram Blanding, one of the two Acting Commissioners (that is, paid members) of the Board, was appointed to this new post and became responsible for all internal improvements except buildings. A separate Superintendent of Public Buildings was created, and after having served two years as the other Acting Commissioner of the Board, Robert Mills received a one-year appointment to this second post.[65] During the following year, Mills must have realized that he was not going to be reappointed and that the Legislature had no intention of appropriating money for an atlas, having twice taken no action on it. He asked Blanding to let him privately publish an atlas using the district surveys as the basis. Blanding gave his provisional approval, and the Legislature ratified the contract on 19 December, 1823.[66] Since Mills was not reappointed to his salaried position during the same session, he began to give his full attention to preparation of the *Atlas* and the *Statistics*.

During the following two years, he revised the district surveys and turned the work of twenty surveyors into a uniform set of maps.[67] He completed his work in 1825, but copies had not been received by 20 December, when the Legislature directed that he was only to be "paid as soon as he may deliver" the copies ordered.[68] They had not arrived within a month because he was not paid until 20 January, 1826. The actual date of publication (the initial distribution by him as publisher) may have been in 1826, but the plates themselves were certainly engraved and printed in 1825 because more than a month would have been required for binding and shipping.

Since most of the district surveys survive, Mills's contribution can be determined by comparing them to Wilson's Map and to the *Atlas* plates. First, there was the problem of scale. Nine surveys or half of the surviving number have the same scale as the *Atlas* maps (two miles to the inch) and so did not need reduction, but the other half employ the twice-as-large scale that Wilson had recommended (one mile to the inch). For Wilson, having two scales was not a particular problem; he had to reduce all of the maps, regardless, to a scale of six miles to the inch, and whether he reduced them one-third or one-sixth mattered relatively little. For Mills the change in scale meant additional work, and as financially embarrassed as he often was, he probably had to do this routine work entirely by himself.[69] He was, though, saved the effort of reducing four of the five districts that had already been printed because although four of the five surveys had been drawn to the larger scale, they already had been redrawn for publication; a fifth survey, Union, was the only one published in 1821 that originally had a scale of two miles to the inch.

Only one district is known to be represented by two separate manuscript surveys: Richland. One of the two manuscripts is the original by Marmaduke Coate and has the larger scale. The other manuscript is half the size, employing the *Atlas* scale, yet is more detailed and more finely drawn. It also has additions and corrections not on the original, and the inscriptions are almost certainly in Mills's hand. The *Atlas* plate for Richland has still further changes, so this reduced manuscript map of Richland is probably a prototype of the *Atlas* maps rather than one of the manuscripts actually used by the printer.[70]

As an example of the kind of correction Mills made, the original Richland survey has "Dorteys old house" written twice near the center of the north side; the prototype had the identical notations, but the easternmost of the two was struck through and changed to "Doughertys"; the *Atlas* version has "Doughertys" in both places. An example of an addition by Mills is the more carefully depicted limits of swamps and the depiction of individual sand hills, both of which go beyond the survey.

As has been mentioned in the section on surveyors, the original surveys varied greatly in the care with which waterways were shown, and many of the surveys have only thin, wavy lines for creeks. William DeBrahm in 1757, James Cook in 1773, and Henry Mouzon in 1775 had shown many of the State's waterways more accurately, but Wilson went even further beyond their example and obviously based his map not only on the surveys, but on previous maps, on plats, and on the studies of rivers that were being prepared specifically for improvements in navigation. Mills is still more specific than either Wilson or Thomas Harllee, for example, in his depiction of the Waccamaw River, so he definitely compiled information independently of the Wilson map and the surveys.

In justice to Wilson, his map is often more specific than the *Atlas* plates, especially for the intricate passages of coastal waters. Some of the surveys are also better maps than the *Atlas* plates, better in being more specific and in having more placenames. Except for the lettering, the 1821 printed map of Lexington is a better map than the one produced by Tanner. Since we have a prototype that was probably prepared by Mills himself, there can be little doubt that the engraving was not equal to the manuscripts that the engraver worked from. "H.S. Tanner & Assistants," which appears on most of the *Atlas* plates, might more appropriately have read "H.S. Tanner's Assistants."[71] Where there are errors between the original surveys and the *Atlas* plates, the engraver is more likely to be at fault than Mills, and this is particularly evident in the misspelling of names which Mills as a South Carolinian would have caught. Tanner ordinarily did better work, and the prototypical map of Richland indicates that Mills had higher expectations.

Comparing the surveys, the 1821 printed district maps, the 1822 Map of the State, and the 1825 *Atlas* plates, Mills appears to be responsible for about one-fourth to one-third of the information in the *Atlas*. Wilson also seems to have added about as much topographical information, but little new nomenclature. Both men had to minimize distortions uniformly and both had to supply much supplemental information about waterways, particularly Mills, since he had three times as many square inches of map surface to fill as Wilson.

A fair example of the additions and corrections Mills made for all of the *Atlas* plates is the revision of notations for the west side of the Pee Dee River in Darlington District. Starting at the south and reading north, the survey had "Lowder's Lake," but it was struck through and "Island" was written in. The 1822 map has "Lowder's Lake" correctly restored as well as "Island"; the *Atlas* has "Lowder's Lake" and "Williamson's Island." The survey does not name "Culp's Neck," but both printed versions do. Between Culp's Neck and Buckholt's Creek, Mills adds ten notations, largely names of property owners who are not on the survey or the 1822 map. Buckholt's Creek (on both printed versions) is "Buckles's Creek" on the manuscript. Most of the names near Society Hill are the same as on the survey and the 1822 map, but there are minor changes such as "Genl Williams Factory" (on the survey and 1822 map) to "Genl. Williams Cotton Factory" and as "J. Evans Mill" (on the survey) to "Evans and Edwards' Mill" (on the State Map and the *Atlas*).

Mills undoubtedly visited every part of the State to gather material for both the *Atlas* and the *Statistics*. As in preparing the *Statistics* he undoubtedly relied upon local sources for part of his information, local sources that were sometimes even more knowledgeable than the local surveyors. Since the manuscript surveys have few notes on them in a different hand, Mills presumably prepared uniformly scaled copies and then took them around the State with him to ask for additions and corrections and to check for himself on information that he could not readily obtain from plats or individual informants.

In addition to generally revising the surveys, Mills added a variety of supplemental information such as each district's relative "geological position," the bearing of its courthouse in relation to Columbia, the coordinates of the Courthouse, the distances between principal points, etc. His Darlington District plate shows streets and buildings which are not shown on the survey, yet the streets and buildings for

Columbia that are painstakingly shown on the survey and on the prototypical map of Richland are omitted in the *Atlas,* as are the surveyed street plans of Charleston and Granby. Again, cost probably forced the omissions. Towns other than Darlington are represented with sections of a conventionalized grid pattern, differing only in the amount of grid. Since Mills could have used the inset of Charleston as well as Vignoles street plan on the district surveys which already was at a scale of two miles to the inch, he must have been unable to. He may in addition, though, have planned a series of separate city and town plans.[72]

The difference in general appearance between the district surveys and the *Atlas* plates is striking, but this is due less to Mills personally than to his use of standard cartographic symbols and typography. The maps are readily comprehensible because waterways are boldly outlined and easily distinguishable from the lighter, parallel lines of roads. The engraver of the 1821 maps, James Wood, had succeeded in producing almost equally readable maps.

As a title page for the district maps and to provide a visual index to them, Mills inserted a map of the State at the front of his *Atlas.* Around the margins of the map is a brief summary of the type of information which appears in the *Statistics* and is partly based on information he was gathering for that volume, but the entire page is essentially a revision of the South Carolina plate in H.C. Carey and I. Lea's 1822 *Complete Historical, Chronological, and Geographical American Atlas. . . .*[73]

Although the *Atlas* represents the labor of at least two dozen people over a period of more than a decade, nevertheless, it is a major accomplishment of Robert Mills. The best cartographers try to ascertain that they are working from dependable primary sources, and they render their information into a form as usable as the scale will permit. They ordinarily cannot and do not attempt to gather data in the field. Mills did; he supplied information himself when it was missing, and he corrected it when he could determine that it was deficient. As a surveyor himself, he knew how to evaluate and make the best use of the work of other surveyors. He contributed to the project in a variety of ways that few men could have and that no one else was willing to do. Most areas of the state were not mapped more carefully for over a century, and innumerable placenames have their present form because his plates made them standard. Every new printing of the Atlas is additional evidence of the continuing value of his work.[74]

Mills wrote in the preface of his *Statistics,* "To advance the interests and honor of his native state, has been with him always paramount." The *Atlas* is only one of the ways he proved the sincerity of this statement. He also worked in South Carolina as an architect, engineer, and author.[75] He left much behind him, yet took almost nothing with him when he left the State and returned North to seek more dependable employment and more demanding commissions.

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