"Backsights"

Essays in Virginia Transportation History

Volume One: Reprints of Series One (1972-1985)

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16. Abstract:

This is the first of two volumes of a project to compile, convert to electronic format, and index the "Backsights" series of essays on Virginia transportation history. Between 1972 and 2007, these essays, by various authors, periodically appeared in various publications of the Virginia Department of Transportation, originally in the *Bulletin* and subsequently in the newsletter of the Virginia Transportation Technology Transfer Center. The essays will be presented in two volumes: Volume I, the current volume, includes all the articles in the initial series (1972-1985); Volume II will include all the articles in the second series (2000 to 2007). These articles cover a wide range of subject matter, from topics specific to Virginia transportation through the years to articles that place Virginia transportation in a national and international context. The topics are as diverse as short biographies of pioneering road and bridge builders; major early highways in Virginia; the role of women in 18th and 19th century transportation; early road and bridge specifications and building practices; the growth of railroads; the evolution of public transportation in Virginia; the varying experiences of travelers throughout Virginia's history; the rise of the automobile age; the history of taverns in Virginia; and transportation-related historic preservation and cultural resource issues.

Although the majority of these articles are long out of print, copies have been regularly requested and utilized by historical and cultural resource researchers, as well as by members of the general public. The requests for specific articles, as well as for information on early roads, turnpikes, canals, etc., have demonstrated the need for this compilation.

These volumes will provide direct electronic access to all of the "Backsights" essays from the inception of the series in 1972 through 2007, along with a comprehensive index for each volume. These essays are utilized by VDOT environmental and cultural resource personnel, as well as by transportation historians, academic and professional historical and cultural resource researchers, and interested members of the public.

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FINAL REPORT

"BACKSIGHTS": ESSAYS IN VIRGINIA TRANSPORTATION HISTORY: VOLUME I: REPRINTS OF SERIES 1 (1972-1985)

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In Cooperation with the U.S. Department of Transportation
Federal Highway Administration

Virginia Center for Transportation Innovation and Research
(A partnership of the Virginia Department of Transportation
and the University of Virginia since 1948)

Charlottesville, Virginia

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DISCLAIMER

The contents of this report reflect the views of the author, who is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Virginia Department of Transportation, the Commonwealth Transportation Board, or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation. Any inclusion of manufacturer names, trade names, or trademarks is for identification purposes only and is not to be considered an endorsement.

The general utility of artificial roads and canals is at this time so universally admitted, as hardly to require any additional proofs. It is sufficiently evident that, whenever the annual expense of transportation on a certain route, in its natural state, exceeds the interest on the capital employed in improving the communication, and the annual expense of transportation (exclusively of the tolls) by the improved route, the difference is an annual additional income to the nation.

—Albert Gallatin, *Report on Internal Improvements*, 1808

Dec. 12th, Wednesday. Hard frost. Left Fredericksburg at nine, A.M. Reached Stafford, C. H., at half-past eleven, Dumfries at five minutes past three, P.M., and Occoguon at half-past five. I made no stop except to breathe the horses, from Dumfries to Neabsco, sixty-five minutes three and a half miles. The five miles beyond Dumfries employed nearly two hours. Roads indescribable.

—John Randolph of Roanoke, 1821

The measures necessary to be taken for affording the means of travelling with rapidity and safety, and of transporting goods at low rates of carriage, form an essential part of the domestic economy of every people. The making of roads, in point of fact, is fundamentally essential to bring about the first change that every rude country must undergo in emerging from a condition of poverty and barbarism. It is, therefore, one of the most important duties of every government to take care that such laws be enacted, and such means provided, as are requisite for the making and maintaining of well-constructed roads into and throughout every portion of the territory under its authority.

—Sir Henry Parnell, *A Treatise of Roads*, 1833

ABOUT THE AUTHORS OF "BACKSIGHTS" (SERIES 1: 1972-1985)

The great majority of the articles in "Backsights" (Series 1) were written by Howard H. Newlon, Jr., and Nathaniel Mason Pawlett. Both gentlemen had long careers with the Virginia Transportation Research Council (now the Virginia Center for Transportation Innovation and Research).

Howard H. Newlon, Jr., received his bachelor's and master's degrees in civil engineering from the University of Virginia. He joined the Research Council staff in 1956, with concrete as his area of specialization, and subsequently built an international reputation in concrete research. He became the Research Council's Assistant Director in 1968. Intensely interested in the history of materials and structures, in 1972 he inaugurated the Council's history research program, including studies of historic roads and bridges in Virginia. He became Associate Director of the Research Council in 1975 and Director in 1981. Following his retirement in 1989, he continued as a consultant to the Research Council for transportation history projects for many years. He is the recipient of numerous awards for his work in engineering and history, including an Honor Award from the National Trust for Historic Preservation and the American Society of Civil Engineer's History and Heritage Award.

Nathaniel Mason Pawlett received his master's degree in history from the University of Virginia and also undertook extensive post-degree work there. He joined the Research Council staff in 1973 and served as Faculty Research Historian until his death in 1995. As principal investigator for most of the Research Council's history projects, his work included numerous studies of early roads, transportation-related records and structures, and significant figures and issues in transportation history.

A number of other individuals also contributed one or more of the articles in "Backsights" (Series 1). Dan Deibler, co-author of "Early Virginia Road Markers: 1725-1828," was a Research Analyst at the Research Council at the time his article was written. Barbara E. Hensley ("A Boulevard for Bessemer") was a Graduate Assistant at the Research Council. John Melville Jennings ("A Site on the Potomac") was Director of the Virginia Historical Society. Emory L. Kemp ("Lemuel Chenoweth: Pioneer Covered Bridge Builder of Western Virginia") was Professor and Chairman of the Department of Civil Engineering, West Virginia University. Ann Brush Miller (author of "The Pine Stake, the Tombstone and the Bee Tree: The Story of the Orange County Colonial Roads Project" and co-author of "Surveyors of Still Another Kind") was Research Historian and Executive Director of the Orange County (Virginia) Historical Society. Independent scholar Dr. William E. Trout III ("Edward Lorraine's Nine-Mile Tunnel"), a geneticist by profession, was Vice-President of the American Canal Society.

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FOREWORD

by

Ann B. Miller
Virginia Center for Transportation Innovation and Research

It is almost impossible to consider the social, political, and technological developments that make up the fabric of Virginia's history without taking into account the evolution of its road system and the related water and rail transportation systems. Despite this, the history of transportation in Virginia has been largely unwritten. Other than a paucity of works on roads, few volumes treat the overall development of canals and railroads in Virginia. Most of those works that do comprise either articles buried in periodicals of limited circulation or theses or dissertations lying unknown to the general public on the shelves of the libraries, colleges, and universities around the nation. It was to remedy these deficiencies, as well as to inform the personnel of the Virginia Department of Highways and Transportation (now the Virginia Department of Transportation) of their history, that the "Backsights" series was conceived in 1972 by Howard H. Newlon, Jr. (then Virginia's Assistant State Highway Research Engineer, later the State Highway Research Engineer and Director of the Virginia Transportation Research Council [now the Virginia Center for Transportation Innovation and Research]).

The first essay of Series 1 of "Backsights" (1972-1985) appeared in the *Bulletin*, a publication of the Virginia Department of Highways and Transportation [now the Virginia Department of Transportation] in December 1972; "Backsights" essays continued to be featured in the *Bulletin* until 1985, when the publication changed to a tabloid format and long articles, such as the "Backsights" essays, did not fit with the new format. Howard H. Newlon, Jr., and the late Nathaniel Mason Pawlett (then Faculty Research Historian for the Virginia Transportation Research Council) were the authors of the major portion of Series 1, although other Research Council staff, academic and historical society personnel, and independent scholars were also represented.

"Backsights" subsequently became a feature in the *The Road Ahead*, the newsletter of the Virginia Transportation Technology Transfer Center Center. A number of the early "Backsights" were reprinted in *The Road Ahead*, and beginning in the year 2000, new "Backsights" essays were published. In mid-2006, the Virginia Transportation Technology Transfer Center moved to the Center for Transportation Studies at the University of Virginia. "Backsights" essays appeared for another year in *The Road Ahead*.

The current volume, *"Backsights": Essays in Virginia Transportation History: Volume I: Reprints of Series 1 (1972-1985)*, includes all the essays in the original series. *"Backsights": Essays in Virginia Transportation History: Volume II: Reprints of Series 2 (2000-2007),* published in a separate volume, includes all the essays in Series 2. Because of space and various other concerns, some of the illustrations in the original "Backsights" articles are not included in either volume, although descriptions of and the captions for such illustrations are.

With their "popular" orientation, the "Backsights" essays probably constitute the best survey of Virginian transportation history readily available to the public. Repeated requests for specific articles, as well as for general information on early roads, turnpikes, canals, etc., demonstrated the need for this compilation. The "Backsights" articles were collected and converted to electronic format, and an index was prepared for each volume. Except for the correction of minor misspellings or punctuation errors, the insertion of an occasional bracketed note providing further information, and some reformatting, the text is unchanged from the way it appeared in the *Bulletin* and *The Road Ahead;* because of this, perceptive readers will notice occasional repetitions of material.

“BACKSIGHTS”: ESSAYS IN VIRGINIA TRANSPORTATION HISTORY: VOLUME I: SERIES 1 (1972-1985)

Benjamin Wright: America's First Civil Engineer

Howard H. Newlon, Jr.

["Backsights" No. 1: originally published in the *Bulletin*, December 1972]

The development of highway technology has always been closely associated with the profession of civil engineering, which provides many of the tools necessary for the design, construction, and operation of roadways and structures. Those who practice this profession obviously are the beneficiaries of the legacy handed down through many earlier practitioners, and it is of some interest to know where this all began in America. In 1968, the American Society of Civil Engineers bestowed the designation of "father" of Civil Engineering in America upon Benjamin Wright. Although very few recognize the name, and fewer still his works, Wright was associated with many of the important projects of the early 19th century. Toward the end of his illustrious career, he was engaged to work on the James River and Kanawha Canal and lived briefly near Scottsville, Virginia. Thus his career is of local as well as national interest.

Benjamin Wright was born on October 10, 1770, in Wethersfield, Connecticut. At an early age he was taught the rudiments of surveying and law by his uncle, Joseph Allyn Wright, in nearby Plymouth. Late in 1789, he rejoined his family in Fort Stanwix, now Rome, New York. Surveying prevailed over the law and his work on the family farm.

As was the case with many of the early American engineers, Wright's professional career was closely involved with the surveying and construction of canals in the northeastern United States. In 1794, he assisted William Weston, a famous English engineer, in surveys for what later became the Erie Canal. When construction of the Erie Canal began in 1817, Benjamin Wright was its chief engineer. Having served as state assemblyman and judge, he was able to cope effectively with both the technical and political problems associated with the project.

The Erie served as a training ground for many of America's early engineers, including Canvas White, Nathan Roberts, David Bates, and John B. Jervis. Wright located other canal routes, including the Farmington (Connecticut), the Delaware and Hudson, and the Chesapeake and Delaware. After the completion of the Erie in 1825, he became consultant on the Blackstone Canal in Rhode Island, and was then chief engineer of the great Chesapeake and Ohio Canal in Maryland.

A new facet of Wright's career began with the appearance of the railroad in America in the late 1820s and early 1830s. Many, including Claudius Crozet, principal engineer of Virginia's Board of Public Works, saw the railroad as an alternate form of internal improvement to the canal. Apparently sensitive to the significance of this new mode of transportation, in 1827 Wright made his first studies on the use of steam locomotives.

In 1832 Wright was appointed chief engineer of the St. Lawrence Ship Canal, as well as street commissioner of New York City. He also became a corporate member of the newly formed New York and Albany Railroad and undertook a series of studies for supplying New

York with water. This period emphasizes the diverse demands placed upon the profession of civil engineering but at the same time reflects its long-standing role providing for the necessities of society.

In 1835 Wright was appointed chief engineer of the New York and Erie Railroad, whose route he had earlier surveyed. Following his wife's death in 1835, he became consultant for the first railroad in Cuba, a project that was completed by his oldest surviving son, Benjamin Hall Wright, in close collaboration with his father.

Wright resigned from the New York and Erie Railroad in 1836 for less arduous work, but even in his late sixties he was consulted on major projects. In 1839, at the age of 69, he was engaged on the James River and Kanawha Canal. He lived briefly at Scotts Ferry (Scottsville). Information about this period of his career is not extensive, but research for a biography on Benjamin Wright being done by Neal FitzSimons, Chairman of the American Society of Civil Engineering's History and Heritage Committee, may shed additional light upon this locally important aspect of Wright's professional career.

In 1839 he also was made chairman of the committee to prepare the constitution of a proposed society of civil engineers, and it was resolved by the group that "the name of Benjamin Wright . . . be placed at the head of the list (of members)." This, along with other testimonials to his accomplishments, led to his honored place in the profession. He apparently became ill and returned to New York, where he died in August 1842, and was buried in Marble Cemetery in New York City.

In Benjamin Wright we see an engineer who displayed versatility in several important areas of civil engineering, who was intimately associated with the early developments of transportation in America, and to whom civil engineers can trace with pride their lineage.

[*Image in original:* Engraving of Benjamin Wright. *Caption:* Benjamin Wright.]

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A Search for Heritage

Howard H. Newlon, Jr.

["Backsights" No. 2: originally published in the *Bulletin*, January/February 1973]

Since the appearance of the initial "Backsights," in the December 1972 *Bulletin*, a research project has been approved for the Research Council under the rather formidable title of "A Proposal for Initiating Research on History of Road and Bridge Building Technology in Virginia." The purpose of this project is to establish a coordinated effort to locate, evaluate, preserve, and disseminate information relating to the construction of roads and bridges in Virginia.

The project is particularly timely for at least three reasons. First, in recent years an increased interest in history has been particularly evident in fields of technology such as engineering. The History and Heritage Committee of the American Society of Civil Engineers has been particularly productive since its formation in the mid-sixties. More recently, several of the founder and technical societies have established archival efforts in conjunction with the Smithsonian Institution. Efforts to utilize the techniques of the archaeologist for the study of the development of technology are reflected in the formation within the past year of the Society for Industrial Archaeology.

Paralleling the efforts of the national technical bodies and the developing academic interest is increased governmental support, particularly as reflected in the National Historic Preservation Act of 1966. Most important and pertinent among the governmental programs are the activities of the Historic American Engineering Records, a part of the National Park Service, established in cooperation with the ASCE and the Library of Congress to record significant engineering structures, such as bridges, canals, and tunnels.

The second development that contributes to the timeliness of the research effort is the recognition that the accelerating pace and magnitude of construction at all levels of government and industry bring the threat that many historic structures, and, more importantly, the technology of their design and construction, will be lost. These concerns are reflected in Presidential Executive Order 11593 signed May 13, 1971.

It should be emphasized that the thrust of the activities discussed earlier is the preservation of the technology rather than of the structures themselves. In some exceptional cases, preservation of the structures may be warranted because of national, regional, or local significance. The preservation of Humpback Bridge near Covington is an excellent example. Significantly, the December 1972 *Bulletin* contained an article describing the Department's current efforts to preserve the Cartersville Bridge.

Many other structures of technical significance exist in Virginia. Many of these, hidden among the byways, may appear insignificant but exhibit the continued year-in and year-out performance which resulted in the engineer's work being taken for granted. An excellent

example is a comparatively small bridge on Route 637 in Bedford County. This bowstring truss, which underwent some modification over the years, was, according to Robert Vogel, Curator of Civil Engineering of the Smithsonian, one of the last surviving examples of its type. Dating from about 1875, this small bridge provided almost one hundred years of service—an enviable record. Unfortunately, it was replaced in 1972 by its more contemporary counterpart, a steel pipe. Fortunately, the components of this truss were retained and hopefully it can continue to serve in some capacity. *[NOTE: This structure was subsequently re-erected at the Ironto Wayside, off I-81 in Montgomery County, where it is used as a footbridge.]*

[*Image in original:* The bowstring truss in its pre-1972 location in Bedford County, Virginia. *Caption:* This small bridge on Route 637 in Bedford County gave nearly 100 years of service before it was recently replaced by a pipe. Photo by Jack E. Boucher for the *Historic American Engineering Record.*]

Although serious attempts to record the history of technology have traditionally been considered as academic, with the ever-increasing pressures for documenting the impact of new construction on existing environmental features, including historic and other landmarks, the need for competent and thorough documentation of such structures takes on added practical and immediate significance.

A third contributor to the timeliness of the research is the approaching observance of the nation's Bicentennial in 1976. The Engineer's Joint Council is encouraging and coordinating the participation of the engineering community in this observance. The public interest in the Bicentennial will also provide an opportunity for the Department to reflect the very important contributions of road building to the development of the area and the country.

The details of the research project will be developed through consultations within and outside of the Department, but the following activities are worthy of consideration.

- An inventory of published and unpublished archival information currently held by various state and local agencies relating to road and bridge construction in Virginia.
- An inventory of structures built prior to about 1920 with detailed studies of the very oldest or structurally unique bridges.
- A similar inventory for roadways.
- Development of information as input to the state's observance of the Bicentennial, and publications for dissemination of this information.
- Establishing of liaison among the operating divisions of the Department and national and local groups interested in various types of historical studies.

Response to the project has been enthusiastic. This is good because it will depend greatly upon voluntary efforts of a large number of people.

In the speech made famous by his plea for liberty or death, Patrick Henry also said, "I have but one lamp by which my feet are guided, and that is the lamp of experience. I know of no way of judging the future but by the past." The dictionary defines heritage as "a legacy—something transmitted by or acquired from a predecessor." It is the rich heritage left by our

predecessors in the road-building effort in the Commonwealth with which this project is concerned.

Roads from the Past: Introduction

Howard H. Newlon, Jr.

["Backsights" No. 3: originally published in the *Bulletin*, March 1973]

Many of the highways which today extend throughout the Commonwealth extend also back in time along post and stage roads, turnpikes, plank roads, and Indian trails over bridges and ferries from which the view progressively changed from that of primeval forest and Indian hut to log cabin and burgeoning town. Highway transportation in the New World literally began in Virginia, which was the site of the first bridge, the first highway law, and the first state Board of Public Works to oversee all forms of internal improvements and transportation.[1]

Several significant serious studies of road development and early transportation have been made but have received limited attention outside of academic circles. Notable among these are three dissertations: one each from Columbia University, the University of North Carolina, and the University of Virginia.[2, 3, 4] These studies, which focus primarily upon the political and economic aspects of transportation policy, contain some limited insights into the technology of road building.

With the early need to move the money crop, tobacco, and with so many magnificent waterways in the Tidewater, the roadways began as important connecting links between the rivers. During the development, two formidable physical barriers to transportation had to be overcome as the frontier moved westward. The Fall Line interrupted navigation of the rivers, while the mountains of the Blue Ridge and the Alleghenies restricted overland passage.

[*Image in original:* Montage of 19th century transportation methods (wagon, canal boat, sailing ship). *No caption.*]

Road building in Virginia prior to the creation of the Virginia Department of Highways in the early years of the twentieth century can be divided conveniently into four periods. Any such division is somewhat arbitrary but the four-period classification reflects the influences of significant changes in political or technological factors that greatly influenced roadway development. The four periods may be identified as follows:

<u>Settlement and Growth: 1607-1782</u>

This period is bounded by the settlement at Jamestown and the period immediately following the War of Independence. It begins with the improvement of crude Indian trails and bridges as described by Captain John Smith. The latter boundary could as well be the beginning (1776) or the end (1781) of the war period, but 1782 is selected because in this year the General Assembly enacted a statute for a general survey of roads through the Blue Ridge, This action officially recognized a critical need to develop transportation connections between eastern Virginia and the Alleghenies, a need which was to influence significantly subsequent road policy.

Experimentation: 1783-1815

This period continues until the year prior to the creation of the Board of Public Works in February 1816. This Board was created to answer Virginia's need for better land and water transportation through canals, railroads, turnpikes, and bridges, and it was the first such body in the New World. Also, in 1815 the newly organized Committee of Roads and Internal Navigation of the General Assembly issued a report which illustrated some of the construction problems faced by the local county road surveyor. This period would be characterized as one of experimentation with a gradual evolution of state rather than county control.

Expansion: 1816-1865

The formation of the Fund for Internal Improvement and the Board of Public Works signaled the beginning of a period with greatly improved technology, increased large-scale projects such as turnpikes, and a general expansion of transportation funding and construction. It was during this period that Laommi Baldwin, Jr., Thomas Moore, and Claude Crozet, who successively held the position of principal engineer, greatly influenced the technology of road building in Virginia. The period ended with the Civil War, during which bridges were destroyed over a huge area and roads badly cut up. The separation of what is now West Virginia removed a large area which had been a pivotal point about which much of the State's transportation policy, as well as much controversy about it, had revolved. The end of the war thus seems a reasonable end point for this period.

Reconstruction: 1866-1906

This period is not as well documented by serious studies as are the three preceding ones. However, many structures built during the period are still in service. This was obviously a period of road reconstruction within the broader era of Reconstruction. The Civil War for the most part ended the turnpike era and the continued importance of railroads, as evidenced by the creation in 1877 of the post of Railroad Commissioner, did not encourage significant expansion of roadways. The Board of Public Works and the Post of Railroad Commissioner were dissolved in 1902 and their duties transferred to the State Corporation Commission. But the event which was most significantly to influence roadway development in Virginia occurred not in the Commonwealth but in a small rented brick shed in Michigan in 1892, where Henry Ford was building his first "gasoline engine." The following spring he marketed his first car, and suddenly the past was but prologue.

In subsequent "Backsights" these periods and projects and the individuals associated with them will be explored in more detail.

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Roads from the Past: Settlement and Growth 1607-1781

Howard H. Newlon, Jr.

["Backsights" No. 4: originally published in the *Bulletin*, April 1973]

When the settlers landed at Jamestown, they undoubtedly encountered a primitive transportation system consisting of the abundant natural waterways of the Tidewater and trails cut by the Indians. Since horses were not introduced into Virginia until two years later, the trails or paths made by the Indians were rudimentary, needing to accommodate only pedestrian traffic. This does not imply that these trails were haphazard or transitory. In fact, there were various classes of trails, just as there are roads today serving "interstate" as well as local needs.[1]

Two trails which were the forerunners of important interstate roads were the Great Indian Warpath and the Potomac Path. The former led from Creek County, Alabama, northward to the Great Lakes region of Pennsylvania and New York. Its eastern branch ran through the Valley between the Blue Ridge and the Allegheny Mountains, and by about 1750 it had developed into the "Great Wagon Road," by which the Valley was connected to Philadelphia. The Potomac Path, the forerunner of the strategic U.S. 1, followed the Fall Line from near Fairfax to Petersburg but is not extensively documented.[2]

In addition to trails, the Indians built bridges if necessary. Captain John Smith, in recounting a visit to Powhatan's village in 1607, described the bridge building of the Indians in these words: "Coming a-shore, landed amongst a many of creeks, over which they were to passe such poore bridges, onely made of a few cratches [tree trunks with forks] thrust into the ose [muddy ooze], and three or foure poles laid on them, and at the end of them the like, tyed together onely with barkes of trees, that it made them much suspect those bridges were but traps. Which caused Smith to make diverse [Indians] goe over first, keeping some of the chiefes as hostages until halfe his men were passed, to make a guard for himselfe and the rest."[3]

Based upon a letter written by Sir Thomas Dale on May 25, 1611, the first bridge built by the settlers was not a stream crossing but a wharf extending from the bank about 200 feet into the nearby channel. This was referred to in a later account (about 1625) as "A framed Bridge, which utterly decayed before the end of Sir Thomas Dale's government (1625), that being the only bridge (any way soe to be called) that was ever in the country."[4]

Even at this time across the mountains to the west stood the first bridge in Virginia (and perhaps in the world). When the Natural Bridge of Virginia was first seen in early colonial times by a white man, an aborigine trail (perhaps the Great Indian Warpath) traversed its deck surface. This in due time, like the other trails, evolved to a bridle path, and at about the time of the American Revolution or a little later, a road that is now U.S. Route 11 had come into use.[5]

The development of roadways in eastern Virginia subsequent to the Jamestown settlement was influenced by the need to move the main money crop, tobacco, and by the abundant and magnificent waterways of the Tidewater and Piedmont. Roads were needed

primarily as connecting links to the rivers, and consequently a great many bridges, ferries, and causeways had to be provided. The importance of roads was recognized by the 1632 Assembly with the passage of the first highway law in the New World. This law, with the epitome of simplicity, said in its entirety: "Highways shall be layd out in such convenient places as are requisite accordinge as the Governor and Counsell or the commissioners for the monthlie corts shall appoynt, or accordinge as the parishioners of every parish shall agree."[6]

As passed and subsequently modified through the years, the law directed that each court was to see that "convenient wayes'' were constructed to churches, to the county courts, to Jamestown, and from county to county. The first colony-wide levy was taken in 1691 as a military effort "for better defense of the country" against incursions of the Iroquois. Thus, the concept of blending peacetime requirements with those necessary for national defense, which much later appeared in the National System of Interstate and Defense Highways, authorized in 1956, has a long tradition in the United States.

Two formidable physical barriers profoundly influenced the extension of transportation facilities. These were the Fall Line and the mountains of the Blue Ridge and the Alleghenies. The fall line was an obstacle to navigation and was not overcome until the construction of the Great Falls Canal and the 3½ mile James River Canal at Richmond in the early years of the 19th century. The Blue Ridge separated the populous and politically powerful eastern Virginia from the rapidly developing but comparatively isolated Valley of Virginia and the Trans-Allegheny region. The problems of communications between eastern and western Virginia not only occupied a large portion of the efforts of those charged with the responsibility for transportation in the Commonwealth but were in large part the cause of the separation of what is now West Virginia in the 1860s.

In the mid-18th century, from the Valley of Virginia, two market areas were available: the distant city of Philadelphia via the "Great Waggon Road," and the closer eastern ports which lay over the mountains. Much trade found its way to Philadelphia but pressures to build roads over the mountains led in 1748 to the first enactment by the General Assembly of specific and local road legislation of a nonmilitary nature.[7] This statute enabled the court of Prince William County to make a levy of tobacco on its inhabitants to raise sufficient funds for clearing a road from Pignut Mountain, in modern Fauquier County, to the Blue Ridge at Ashby's Gap. This act marked the beginning of special petitions from local groups for roads through the Blue Ridge and was a significant step in the competition for trade between the two areas of Virginia.

Road construction during the period prior to the War of Independence was succinctly described by Jefferson in 1785. "The roads are under the government of the county courts, subject to be controlled by the general court. They order new roads to be opened wherever they think them necessary. The inhabitants of the county are by them laid off into precincts, to each of which they allot a convenient portion of the public roads to be kept in repair. Such bridges as may be built without the assistance of artificers, they are to build. If the stream be such as to require a bridge of regular workmanship, the county employs workmen to build it, at the expense of the whole county. If it be too great for the county, application is made to the General Assembly, who authorizes individuals to build it, and to take a fixed toll from all passengers, or

given sanction to such other propositions as to them appears reasonable. Ferries are admitted only at such places as are particularly pointed out by law, and the rates of ferriage are fixed."[8]

With the coming of independence, the view of the nation, as well as that of Virginia, turned westward. It soon became apparent that the county system would not furnish the necessary through-roads from East to West. In 1782 the Assembly of Virginia enacted a statute calling for a general survey of roads through the Blue Ridge and between several port towns.[9] The preamble to this act read in part "Whereas the roads from the passes in the mountain commonly called the Blue Ridge to the seat of government, and to other sea-port towns, and from one sea-port town to another, are so indirect and unfixed that great difficulty and expense both arose to the good people of this commonwealth travelling thereon, as well as greatly increasing the public charge of carriage . . ." Unfortunately this act, which was intended to be conducted and paid for from private funds, was largely ignored by the public and the Assembly was subsequently forced to find means to support the effort. But the seeds were sown for an era of experimentation and the gradual evolution of state rather than county control. This period will be discussed in the next "Backsights."

[*Image in original:* Conjectural map of early Jamestown (from Rose, *Historic American Highways*). *Caption:* (On the map) 1611 The First American Bridge.]

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Roads from the Past: Experimentation 1783-1815

Howard H. Newlon, Jr.

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At the end of the American Revolution the attention of the new nation shifted from England and Europe, on whom trade and political life had depended for over a century and a half, to the areas in the west. Beyond the mountains was a rich and vast region whose trade was coveted by the merchants of the Atlantic ports. They feared particularly its possible loss to the Spanish port of New Orleans. Political leaders realized that the loss of economic control would be followed by the loss of political control as well. Several states, among them Maryland, New York, Pennsylvania, and Virginia, set out to capture this trade through a program of internal improvements. The general plan was to improve the natural waterways and to construct canals and supplemental portage roads where required. This plan signaled the beginning of the "Canal Era" and was to have a profound influence upon road development as well.

Thus the surrender at Yorktown in eastern Virginia portended a renewed awareness of the need for communications routes with the west. Support for improved routes with the areas beyond the mountains had just begun to gain momentum when it had been interrupted by the War. In 1782 the Assembly of Virginia had enacted a statute calling for a general survey of roads through the Blue Ridge between the Valley and the several port towns.[1] As the line of settlement pushed further westward, the problem of providing connections with the Trans-Allegheny arose.

Merchants in eastern Virginia, like those along the Atlantic seaboard, feared that trade from the Valley of Virginia cold be diverted to Philadelphia via the Great Waggon Road or to New Orleans via the Ohio River system and the Mississippi. They thus strongly supported, along with the settlers in the Valley and Trans-Allegheny region, the funding of the new transportation routes.

The nationwide interest that was developing in river navigation was shared and promoted in Virginia by leaders such as Jefferson, Madison, Washington, and Henry, all of whom maintained a greater interest in rivers than in roads. It was from this climate that the James River Company and the Potomac Company were incorporated in 1784 to canalize their respective rivers.

In 1785 the general road law was revised to get greater unity of action throughout the state. A problem relating to transportation facilities that was to plague the state in its efforts to connect east and west, and that in large measure led to the ultimate separation of what is now West Virginia, stemmed from the differences between the two areas of the state. In the east the towns were larger, capital was more plentiful, distances were shorter, and construction was easier. This situation encouraged the formation of private road building companies in this area. The west, on the other hand, was sparsely populated, the tax base was much smaller, and construction more difficult. Thus, public financing was usually required but difficult to obtain.

Times do not change very much! Although the right to collect tolls on roads had been granted by the Assembly in 1772 for repairs in Augusta and Nansemond, the enfranchisement of private turnpike companies did not begin in earnest until about 1795. Prior to 1811 most of the roads in the east were built with private funds while those in the west were directed by the legislature. This was the beginning of a "mixed enterprise" system using both private and public funds that was to be greatly expanded later and which was unique in America at the time.

A subsidiary method of road finance was the lottery. In 1790 a lottery "not to exceed four hundred pounds" was authorized by the Assembly for the purpose of "cutting a road from Rockfish Gap . . . to Nicholas' and Scott's landing on Fluvanna River."[2]

The general road law of 1785 stated that "Every surveyor of a road shall cause the same to be constantly kept cleared and smoothed, and thirty feet at least, unless the court shall by order entered of record authorize a lesser width."[3] The only requirement for bridges was that they have a width of 12 feet and be safe and convenient. These roads were generally cleared of vegetation. Paving of the central portion was uncommon and generally reserved for "turnpikes." An early act in Ohio provided that stumps, left in the road should not be more than a foot high.[4] Records indicate that the state of the county roads in Virginia was probably a little better.

In the period 1781-1815, nine turnpike companies were incorporated as shown in the accompanying table:

Name	Date	Route	Length in Miles
Manchester	1801	Manchester to Falling Creek coal mines	12
Little River	1802	Alexandria-Aldie	33¾
Fauquier & Alexandria	1808	Warrenton to Little River Turnpike at Fairfax C. H.	28½
Ashby's Gap	1809	Aldie-Middleburg-Paris- Shenandoah River	20½
Leesburg	1809	Leesburg-Dranesville	20
Snicker's Gap	1810	Aldie-Snicker's Ferry	33¾
Swift Run Gap	1810	Fredericksburg-Orange C. H.	36½
Fairfax	1813	Washington Bridge to Little River Turnpike	3
Falls Bridge	1813	D.C. Line to Difficult Run	13

Not all of these roads were completed, and the real "turnpike era" was not until the period 1816-1860.[5] The Little River Turnpike was constructed, however, and was in business until the mid-1890s. It is particularly significant, since it was built by one of the first turnpike companies to be incorporated in America.[6] The term "turnpike" was used in various ways but in general denoted a road with an artificial surface as opposed to one which merely was cleared of trees and brush.

Nationally, the slowness of the early state attempts to open routes to the west brought repeated demands from both east and west until the U.S. Congress was practically compelled to take some action. In 1806 Congress passed the Cumberland Road Bill to provide for construction of a road from Cumberland, Maryland, to the state of Ohio. The following year the Senate passed a resolution directing the Secretary of Treasury to prepare a report on internal improvements in the U.S. and 13 months later the Secretary, Albert Gallatin, prepared a comprehensive plan combining the many local independent projects into a national system of roads and canals.[7] The time was not yet ripe for this national scheme and sectional rivalries soon

forced abandonment of the program. Consequently, the internal improvements campaign was fought out on the state, not the national, level.[8] The die was cast, however, for consideration of a national transportation network.

> [*Image in original:* Carl Rakeman painting of Gallatin and Jefferson (from Rose, *Historic American Highways*). *Caption:* Artist Carl Rakeman's conception of Secretary of Treasury Albert Gallatin presenting his report on roads and canals to President Thomas Jefferson.]

In his report, dated April 16, 1808, Gallatin listed only three Virginia turnpikes: Alexandria to Middleburg (The Little River Turnpike) and two around Richmond. He wrote "South of the Potomac few artificial roads have been undertaken. From Alexandria one is now progressing, in a northwestwardly direction toward Middleburg. Another has lately been commenced from Richmond to Ross's coal mine; but the only one which, so far as any accounts have been received, is completed, extends twelve miles from Manchester, opposite to Richmond, in a westwardly direction to the coal mines of Falling Creek. This road, thirty-six feet wide, is gravelled and has cost $50,000, but the last four miles did not cost more than at a rate of $3,000 a mile. Yet it is sufficiently substantial, the route being very level, to admit wagons carrying four tons."[7]

For the most part, interest in internal improvements remained on a local level throughout this period of experimentation. Movement away from the time-honored practices was slow but the many successful experiments had proved that departures from extreme local control could be successful provided the administration of the projects was efficient. New methods of financing roads had worked; several privately operated turnpikes were in operation. Good roads had been established in the great market areas of Richmond and Alexandria, and the Blue Ridge had been crossed by adequate roads in several places. Canals had been opened around the falls of both the James and Potomac Rivers. Yet in spite of these local accomplishments, the principal problem of connecting eastern and western Virginia remained unsolved.[7]

The cry for greater state involvement continued. The state acted and in 1812 the Assembly appointed 22 commissioners to view and survey the James River west of Lynchburg and the New, Greenbrier, and Kanawha Rivers. Three commissioners were to locate the most convenient route for a turnpike from the mouth of Dunlap Creek in the James to the Greenbrier River.[9] This effort was ultimately to include the building of the Humpback Bridge and a route that followed the general location of what is now U.S. 60.

Governor Wilson Cary Nicholas on November 30, 1812, minced no words when he told the Assembly:

> "I cannot omit to press upon the attention of the Legislature the state of our roads, which is to us a subject of reproach. The condition of public roads is not unfrequently resorted to for the purpose of testing the extent of improvement in which they lie. Should we cast our eyes over the map of America, and compare the progress of Virginia with that of some of her sister states . . . how striking, how humiliating the contrast."[10]

Two weeks later a resolution was presented to create the Fund for Internal Improvement. This fund was to be used "exclusively for the purpose of rendering navigable the principal rivers and of more intimately connecting by public highways, the eastern and western waters of the state." Again the effort was interrupted by war. The War of 1812 delayed passage of the resolution but led to the formation of a standing House Committee for Roads and Internal Navigation. Subsequently, the Fund was approved and a Board of Public Works, the first such group in America, created to administer it. The period of experimentation had ended with an increased involvement of the state in road building, and a new era in the technology of road and bridge building dawned in the Commonwealth.

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Roads from the Past: Expansion 1816-1860

Howard H. Newlon, Jr.

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In 1816 the General Assembly created the Fund for Internal Improvement and established a Board of Public Works to administer it.[1] This landmark action came exactly one hundred years after Spotswood had led his Knights of the Golden Horseshoe to the top of the Blue Ridge. During the intervening years, these mountains and subsequently the Alleghenies further to the west had stood as formidable barriers to transportation connections between the two portions of the Commonwealth, a situation the Board was expected to solve.

The legislation passed in 1816 was essentially that which had been proposed in 1812 but which had been sidetracked by the war that began in the same year. Initially the value of the fund was more than $1 million and it was anticipated to grow to more than $10 million. The fund was to be used to canalize the rivers and to construct roads necessary to connect the canals.

The creation of the Board of Public Works, the first such body in the United States and a model in many respects for subsequent highway and transportation departments, initiated an unparalleled and almost unimpeded expansion in both land and water transportation in the Commonwealth.

The creation of the fund and the board was by far the most significant event in the history of transportation in Virginia to that time and ranks in importance with any subsequent development for several reasons. First, it culminated in the trend toward a statewide, coordinated system of routes as opposed to the fragmented road-building efforts of the individual counties. In the second place, the action created a special fund for transportation within the state treasury apart from general revenues, thereby placing the financing of transportation on a significantly sounder basis than in the past. This action also represented a specific commitment on the part of the state to provide routes between the east and west. Finally, the creation of the position of principal engineer, to be responsible to the Board, signaled a dramatic increase in the amount and competence of technology and engineering that would be applied to the various projects under the Board's jurisdiction.

So great was its influence that the period covered in this article could well be called the "Board of Public Works Era." An idea of just how dramatic was the growth during this period can be gained from a few statistics. By the end of 1815 eight turnpike companies had been incorporated, with but a very few miles in service. By 1840 this number had increased to 47 and by 1860 to 190.[2] The James River Company had by 1816 constructed a seven-mile canal around the falls at Richmond and cleared the river of obstructions to Crow's Ferry. By 1851 the canal was completed from Richmond to Buchanan.[3] In 1816 there were of course no efforts at rail transportation, but in August 1829, the "Stourbridge Lion," an early steam engine locomotive, was imported to the United States, and this signaled a new era in surface transportation. Because

of its timing, railroad development in Virginia was completely under the jurisdiction of the Board of Public Works.

Some of Virginia's transportation growth was obviously the natural consequence of the expansion of population and available technology occurring all over the nation, but in Virginia the fact that there was a formal and coordinated transportation effort enabled the expansion to take place in an orderly and directed manner.

The internal improvement fund was created through the transfer of shares held by the state in the stock of the Little River Turnpike Company; the Dismal Swamp, Appomattox, Potomac and James River Canal Companies; the Bank of Virginia; and the Farmer's Bank of Virginia. The total value was $1,249,211, of which a portion produced an annual income of approximately $100,000. Only this last amount could be used immediately for construction, but it was confidently predicted that in the course of 20 years the state would be able to construct public works up to a total value of approximately $10.5 million.[4]

With the exception of the bank stocks, all of the shares were from transportation companies. Thus, the concept of using the revenue from existing transportation facilities to finance subsequent facilities—a concept that was greatly expanded in the 20th century—has a long tradition in highway financing. The fund was used to supplement funds from private sources. When a company that intended to build a facility had raised three-fifths of the necessary funds by sale of stock, the state would supply from the fund the remaining two-fifths. This approach was the forerunner of today's "matching funds." Virginia was the first state to develop, and the only state to apply for the duration of the entire antebellum period, the principle of "mixed enterprise"—a combination of public and private enterprise—to her internal improvements program.[4]

The board consisted of thirteen members: the governor (president ex officio), the treasurer of the Commonwealth, the attorney-general, and 10 citizens "of whom three shall reside westward of the Allegheny Mountain; two between the Allegheny and the Blue Ridge; three between the Blue Ridge and the great post road (along the Fall Line)—and the residue, between the road and the seacoast."[1] Thus, the concept of geographically balanced citizen commissioners also has a long tradition in Virginia.

As important as the creation of an adequate financial base was the creation of a greatly expanded technological base in the position of principal engineer. As originally conceived, the services of the principal engineer were to be made available to the various companies, who would reimburse the internal improvement fund. In actual practice, the fund generally absorbed the cost of these engineering services.

During its formative years the office was filled by two individuals of considerable national reputation. The first principal engineer, appointed in 1816, was Laommi Baldwin, Jr. He would thus qualify for the title of "Virginia's First Transportation Engineer." Baldwin, whose father was also an outstanding civil engineer, resigned in 1818 and concentrated his activities on various projects in the Northeast.[5] Baldwin was succeeded by Thomas Moore, about whose life at this period little is known. Moore, who died in 1822, was succeeded by a

man who perhaps had the greatest impact of any individual upon transportation engineering in Virginia, Claude Crozet. Crozet served two terms, 1823-31 and 1838-43. The hiatus in his service resulted from a conflict with the legislature over the direction of transportation policy.

[*Image in the original:* Carl Rakeman painting of the Board of Public Works (from Rose, *Historic American Highways*). *Caption:* Artist Carl Rakeman's conception of Laommi Baldwin and the Virginia Board of Public Works.

Experience gained in the construction of roads had in 1815 led the newly formed Committee on Roads and Internal Navigation to issue a report which graphically illustrated the varied character of road building in the Commonwealth. It divided the state into three areas: Tidewater, Piedmont, and Mountainous West. The report stated: "The soil in the first division is sandy and level requiring but little from art and labor to make good roads, ditching and bridging being nearly all that is requisite. The second division contains a variety of soils and surface. Sand gravel and clay are its component parts. More art and greater expense will be required in this division; paved roads in many instances will be indispensable. The third division, although rough and mountainous, will require more art in the direction of roads, but less expense in structure; being dug out of the sides of hills and mountains, their base will be dry, solid, and permanent. Bridges in this division will be a considerable expense."[6]

The improving technology is further reflected in an early act prescribing certain regulations for the incorporation of turnpike companies. The act established permissible sizes of wheels and weights of vehicles. It further outlined the general requirements for regular and "summer" roads.[7]

Baldwin widely advocated paved roads as did his successors, all of whom were familiar with the ideas of the Scottish engineers McAdam and Telford. One of the first attempts at specifications was given by Baldwin, who wrote: ". . . a road bed thirty feet wide into which are placed large stones well beaten close to each other over the whole width. Upon this is another bed of stones broken to the size of about four inches, well hammered and rammed in, so as to fill all the cavities between the under stratum of large stones. The third and last layer should be coarse gravel or stone broken to the size of hickory nuts, thrown on evenly or rammed or rolled with a heavy iron roller. The first should be from a foot to eighteen inches thick, the second 12 inches, and the last about 10 inches in the middle and 8 at the sides."[8]

Few of the road sections or structures built under the guidance of the board survive, but many of the locations are followed by modern highways. Because of their length, four of the routes would probably qualify as the superhighways of the 19th century.[2] These are the Kanawha, which extended from Covington to Charleston (about 150 miles), the Staunton and Parkersburg (about 234 miles), the Northwestern, which ran between Winchester and Parkersburg (about 237 miles), and the Southwestern, which connected Buchanan and Bristol (about 175 miles). The Board also was overseer to the plank road craze that swept the nation in the mid-19th century. Roads in many localities still carry the designation "the plank road" as the only reminder of this short-lived technological development.

In 1831 in an action related to the controversy with Crozet, the 13-member board was abolished and a new board consisting of the governor, lieutenant governor, and treasurer of the state was instituted. After this revision, decisions concerning the location and construction of routes became increasingly a tug of wits and wills between the Whigs and the Democrats.[9]

The records of the Board of Public Works as well as those of the General Assembly are filled with extended discussions of bond financing vs. pay-as-you-go, state vs. private development of roads, requirements for tolls vs. free access, suggestions that some sections of the state received more than their share of funds while others received less, and many other still current controversies.

This was an era of unparalleled expansion and growth that laid many bases both physical and philosophical for later roads and policies. In April 1861, a shot was fired in South Carolina that was to change, at least temporarily, the character of Virginia's roads. These roads, conceived as routes to connect the east and west now became routes over which the conflict between North and South would be resolved. Once again peaceful roads became, hopefully for the last time, wartime roads.

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Roads from the Past: War and Reconstruction 1861-1906

Howard H. Newlon, Jr.

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Roads are always vital to the conduct of war and as a result suffer greatly from its ravages. Thus it was in Virginia during the period 1861-65. For the majority of Virginia's turnpikes the Civil War was a fatal blow. Only the most strategically located and exceptionally well built, such as the Valley and Little River turnpikes, were able to survive. In addition to physical damage it inflicted on the roads, the war and its ramifications had a significant impact upon every aspect of the internal improvements program.

The gathering clouds of war had provided the catalyst for the splitting of the State into two. A strong case can be made for the view that dissatisfaction with internal improvements was equal to or greater than opposition to slavery as a cause for the division. Editorials of the period reflect relatively little abolitionist sentiment in West Virginia. On the other hand, petitions and written concerns that the Trans-Allegheny was getting less than its fair share of money and improvements were manifold. Such dissatisfaction apparently was not without cause. While the State invested an average of over $1,000 per mile in turnpikes in the Valley and eastern Virginia, in the Trans-Allegheny, it spent a miserly $60 per mile.[1] The Trans-Allegheny turnpikes were not called "mud pikes" without cause.

The roads of the Valley were of particular importance to Jackson in his celebrated campaigns in that area. One of the most incredible of his escapades was the use of the Valley turnpike on two occasions to transport trains, captured from the B&O lines at Martinsburg, down the Valley to be placed on Confederate rails for shipment to Richmond. In May 1861, Jackson captured four small locomotives at Harpers Ferry. He moved them to Winchester over a branch line and then hauled them with horses down the Pike to Strasburg, where they were placed on the rails of the Manassas Gap Railway. This venture was so successful that in July he used the Turnpike again, this time to move much larger engines, each requiring a team of forty horses, all the way to Staunton. In this way, fourteen B&O engines "made the Gap" down the summer of 1861.[2] It was a tribute to the macadam surface of the Pike that it apparently survived with only modest damage.

> [*Image in the original:* Carl Rakeman painting of Confederate troops on the march (from Rose, *Historic American Highways*). *Caption:* Artist Carl Rakeman's conception of the Confederate Army passing the tollgate on the Shenandoah Turnpike.]

Because of their strategic importance and because most were constructed of wood, the bridges were especially vulnerable to devastation. Jackson and Ashby were without peers as bridge burners. The term "burning their bridges behind them" became an apt description.

A determination of the number of bridges destroyed is not easily obtained, because it is difficult to distinguish from records and writings between permanent structures and those built by the armies. The temporary structures were sometimes on pontoons, although submerged wagons commonly served as temporary substructures. Bridges were sometimes destroyed by mistake, as reflected in a telegram from General Lee to General Bragg in 1864 which said, "I have just learned that General Glary *[sic]* from causes unknown to me burned Meadow Bridge last night. Please cause it to be re-established as soon as practicable. Troops will assist in the reconstruction. Timber suitable for the purpose should be sent as there is none there. Meanwhile a pontoon bridge should be laid. It is important to this army . . ."[3] (Meadow Bridge crossed the Chickahominy north of Richmond.) Most bridges were destroyed by design, however. The 1862 report of the Valley Turnpike Company to the Board of Public Works stated "when our army came up the Valley last spring and summer they destroyed every large bridge (except Middle River Bridge) on the road and nearly every small bridge from Winchester to Harrisonburg." The report also expressed the difficulties of repairing the damage: "It is impossible to get hands to repair our road, and it is getting worse every day." The company got some help from friend and foe alike as indicated by the additional comment: "The federal army put temporary bridges over Stony Creek and Cedar Creek and they may answer the purpose until high water, when it is thought they will wash away, although all precaution will be taken to preserve them as long as possible. The government has rebuilt all the other (large) bridges that were burnt . . ."

The concern over the temporary bridges was well-founded because the report of the company dated October 1863 records: "The temporary bridge over Cedar Creek washed away last summer (leaving a bad ford). All contractors in army. No work done below Sparta because of enemy."

These reports reflect a portion of the tribulations that war brought to the road system. Perhaps the manifold problems are best summarized in the report made to the Board of Public Works by the Luray and Front Royal Turnpike Company dated January 1, 1870, which said:

> Gentlemen: Our last and ninth annual report was of date September 22, 1860, since which the operations of this company have been interrupted by the rude visitation of war, lasting for some four years, and leaving us in such condition that we could not make an earlier communication.
>
> There were but few subjects of public character which gave greater evidence of the devastating influence of war, than did our highways, turnpikes, and public roads. Especially was it the case with our road, as it became the thoroughfare for the movements of each army, with their parks of heavy artillery, trains of wagons, forage teams, troops of cavalry, &c., at all seasons, whether wet or dry, and in advancing or retreating, as the exigencies of military interest demanded, during which no repairs were done upon it. Our road bed was terribly cutup and suffered to wash into gullies. The bridges were either destroyed by fire or worn out for want of attention, and few of the streams were left with proper crossings. The road became almost impassable.
>
> At the time of our last report there was a balance of $517.36 in the hands of the treasurer, which sum has been absorbed by the payment of taxes and debts due by the company, and from the report of the Committee appointed to settle with the treasurer, there is a balance due him of $13.29.

Despite the bleak outlook the Company decided to resume its operations rather than to return its roads to Page and Warren Counties, but ultimately the latter course was necessary. The report, however, emphasizes the dual aspects of the dilemma facing the turnpike companies: physical damage and depleted funds.

After the war, the Board of Public Works continued to receive reports from some companies now in the newly created state of West Virginia, although these sometimes indicated that the local authorities would not permit the collection of tolls. These reports continued until the litigation between the states was settled. An important part of the litigation between the two Virginias was concerned with the distribution of state debt that had existed at the beginning of 1861, much of which was a result of the internal improvements program. Virginia claimed that the new state should assume one-third of the debt because it contained one-third of the former population and one-third of the territory. West Virginia asserted that it should bear only that portion of the cost of the improvements within its boundaries. The latter view ultimately prevailed despite the argument that the residents of West Virginia had been and were benefited by the eastern improvements. The division of the cost of the improvements. particularly the interstate routes, posed a special problem for the expert accountants.[4]

The Board of Public Works gradually began to transfer the state's interest in turnpikes to the counties in which such roads lay. The rebuilding of the roads and the creation of new roads largely took place under county control. The county records of meetings of boards of supervisors and circuit court proceedings reflect the expansion of local efforts and the large portion of the county officials' attentions that were directed toward road matters, including the appointment of road commissioners to open or maintain specific roads and to contract for bridges. Scarcely recovered from the ravages of war, the road system was devastated by two severe floods, one in 1870 and another in 1877.

Attention to railroad transportation was altered by the creation of the office of railroad commissioner in 1877. The character of the Board of Public Works gradually changed from its earlier primary concern with transportation. In 1884 it became responsible for registering all the property of the state, real and personal. With the drafting of a new constitution, the Board of Public Works went out of existence in 1902, and its duties were assumed by the State Corporation Commission.

The road and bridge building efforts of the counties continued, but the same need for coordination that had led to the formation of the Board of Public Works in 1816 resulted in the creation of the State Highway Commission in 1906. The act provided that the "commissioner, together with professors of civil engineering of the University of Virginia, Virginia Military Institute, and Virginia Agricultural and Mechanical College and Polytechnic Institute, one such professor to be designated by each of the boards of visitors of said institution, shall constitute the State Highway Commission."[5] All were required to be civil engineers.

Thus began a new era in road development in the Commonwealth. But perhaps the event that was most significant to subsequent developments during this period occurred not in the Commonwealth but in Michigan, where in 1893 Henry Ford marketed his first car. The motor age was born. The periods of transportation development characterized by settlement,

experimentation, expansion, and reconstruction suddenly became but a prologue for an era of unimagined highway construction.

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The Punctured Dragon of the Potomac

Howard H. Newlon, Jr.

["Backsights" No. 8: originally published in the *Bulletin*, September 1973]

The simultaneous use of facilities by various types of transportation has received increasing attention in recent years as a potential solution to the complex problem of moving people and goods in urban areas. The technical literature and the popular press are replete with discussions of "multi-modal facilities" and "joint use of rights-of-way." While these ideas might appear to be new, they are in fact extensions of solutions sought by earlier transportation engineers and planners, as evidenced by a novel and interesting structure that for twenty years simultaneously carried horse drawn canal boats, carriages, and pedestrians on an elevated crossing of the Potomac at Georgetown. The difficulties of maintaining a watertight seal in the trough-like wooden structure was evident from the numerous leaks that spurted water to the Potomac below and earned the structure the somewhat disparaging designation of "The Punctured Dragon of the Potomac." But despite its leaky appearance, it served its time and owners well, and its history reflects for modern planners and engineers the need for adaptation and modification of facilities to meet changing conditions.

In the early 1830s the Alexandria Canal Company was formed, and soon afterward it initiated efforts to span the Potomac with an aqueduct that would extend the Chesapeake and Ohio Canal into Virginia. This was the third location at which the Potomac was bridged, the first being the Chain Bridge and the second the Long Bridge crossing between Maryland Avenue and Alexander's Island on the Virginia Shore. Ithiel Town was hired as the Company's bridge consultant. Town, an architect and bridge promoter from Connecticut, had patented in 1820 a wooden bridge truss consisting of a latticework of thick wooden planks pinned at the intersection points. This type of truss was a distinct departure from earlier bridges, built by such men as Theodore Burr, in which arches and exterior supports were used. Town himself built his lattice bridges, many of which were covered, and granted the rights to build them to others for a royalty of $1 per foot. He was very active in North Carolina, and his methods spread northward, especially into Southside Virginia. No Town lattices survive among Virginia's covered wooden bridges—the last was Montgomery's Little River Bridge north of Floyd that was removed in 1944. Burr-type arches can today be seen in two of Virginia's covered bridges—one over the North Fork of the Shenandoah near Mt. Jackson and the other, Humpback, near Covington.

Competition among bridge builders was keen for the projects offered by various groups, and when the Alexandria Canal Company announced plans to span the Potomac, Town, who maintained an office in Washington during the Jackson administration, was on the job. He had several years earlier been disappointed when the contract for rebuilding the Long Bridge had been awarded to others. The preference of the Canal Company was for a stone structure, but Town and his partner, Alexander Davis, ultimately constructed a wooden bridge over stone supports to enclose the waterway. The length of the structure was 1,446 feet across 9 spans, with the wooden trough 17 feet wide and 7 feet deep. This Georgetown aqueduct served for 30 years to carry boats across the Potomac between the C&O Canal and Virginia's tidewaters.

[*Image in original:* Photo and diagram of the aqueduct (from Allen, *Covered Bridges of the Middle Atlantic States*). *Caption:* For 30 years this aqueduct served canal boats, carriages, and pedestrians crossing the Potomac at Georgetown. *Inset:* A diagram of the aqueduct.]

During the Civil War, the trough was drained and served as a roadway for troops deployed to protect Washington. After the war the aqueduct took on a prophetic and unique character. In 1866, the superstructure was rebuilt, using the Howe truss plan. The builders laid on a top-story roadway with high railings on the roof, but canal boats continued to cross, pulled by teams of animals plodding the perched towpath. On the roof, carriages and pedestrians traversed the river. Some of the pedestrian traffic consisted of those on both sides of the river who enjoyed a leisurely stroll. This multi-mode facility served for twenty years until the U.S. Government purchased the canal in 1886 and the facility was abandoned in favor of a new iron truss bridge. The ruins of the old aqueduct supports can still be seen west of Key Bridge.

For fifty years this wooden structure bridged the Potomac, serving successively as a canal, a military defense line, and a multi-mode structure, adapted and modified as necessary to meet the changing requirements. Thus, the "punctured dragon" can serve as a symbol to modern planners and engineers faced with the complex and perplexing task of providing flexibility and adaptability in the solution of current urban transportation problems.

Acknowledgment

This article is based primarily upon descriptions in *Covered Bridges of the Middle Atlantic States*, by Richard S. Allen, the country's leading authority on covered bridges. To date he has published four volumes of a projected series. His diligence and scholarship are evident in the books, which are must reading for anyone interested in wooden bridges. His permission for me to draw so heavily on his labors is greatly appreciated.

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"With Good and Responsible Individuals": A Look at Contract Specifications of 140 Years Ago

Howard H. Newlon, Jr.

["Backsights" No. 9: originally published in the *Bulletin*, October 1973]

When the magnitude and complexity of the projects required to meet the transportation needs of the Commonwealth increased beyond the capacities of local authorities, state action was necessary. This action took the form of authorization by the General Assembly for the construction of specific projects, normally by contract with craftsmen who were the forerunners of our road contracting industry.

The action of the General Assembly usually established the amount and source of money to be spent for a project. Sources included local or statewide levies, lotteries, and the internal improvement fund. The physical limits of the project and geometric factors such as width and grade were also set by the Assembly.

After 1816 the major road-building effort was made by the various turnpike companies under the guidance of the Board of Public Works. Naturally, as it became necessary for the various governmental bodies to contract for the construction of roadways and bridges, it became necessary for specifications to be prepared, usually for each project. These specifications, while much briefer than those currently necessary, reflect most of the major concerns of today's road builders.

Typical of these are the specifications prepared for the construction of a nine-mile section of turnpike road adjacent to the James River and Kanawha Canal through the Blue Ridge Gap north of Lynchburg. In March 1831 the General Assembly stated:

> Be it enacted by the general assembly, That the sum of nine thousand dollars of the income of the fund for internal improvements be, and the same is hereby appropriated to the construction of a road for the passage of carriages and heavy loaded wagons, from a suitable point at or near the lower end of the James River Canal at the mountain section, to a point on or near the North river at the upper end of the said canal . . .
>
> In the formation of the plan of the said road, just regard shall be given to the following objects, to wit: the preservation of the canal; the conduct of the travel on said road to the toll bridge of the James River Company, and the termination of the road eastwardly, at a point favorable for its intersection with the Lynchburg and Blue Ridge turnpike, and westwardly, with roads to Lexington and Natural Bridge.

In February 1833, the Assembly reaffirmed and slightly amended its previous action:

> . . . Provided, That the said president and directors shall be able to contract with good and responsible individuals for the completion of the said turnpike road, for a sum not exceeding nine thousand dollars: Provided, however, That in the location and construction of said road, between the lower end of the canal, and a point at or near the upper end thereof, the said president and directors or their agents may depart wholly or in part from the margin of the canal, selecting such other route as may be deemed most suitable.

The assembly also established the grade by stating:

> Be it further enacted, That no part of the said road shall be made at an angle of elevation exceeding five degrees.

A field book prepared in 1833 shows the survey of the road by William Paxton and contains an extract form the specifications for the project. Paxton was one of the several consulting engineers hired by the Board of Public Works during the hiatus in Claude Crozet's tenure as principal engineer. The specifications read as follows:

1. The width of the road to be 22 feet of actual carriage way (exclusive of ditches) raised in the center not less than one foot, neatly rounded and smoothed on top from side to side.

   No ledges or large stones to be left under and within one foot of the surface of the road, nor any stone left on the surface larger than an egg.

2. All embankments or filing to be raised one tenth higher than the proper height, to allow for settling.

3. No perishable materials to be used in the construction of the road, or left on the carriage way, but all trees, stumps, logs, brush, roots, etc. are to be removed at least thirty feet from the center of the road, on both sides thereof, except on the sides of steep hills, they are to be removed from the upper side of the road to below the foot of the embankment. Nor is any stone to be thrown on the bank above the road.

4. On the sunny side of the road, thriving young trees may occasionally be left for the purpose of shade, and such trees may be left at the foot of the embankment on steep hill sides.

5. Where walls are indispensable, they are to be built of good dry masonry, at least two fifths of their height thick at the base, and never less than two feet thick at top, resting on good foundations, cut so as to dip into the hill, and battered on the outside three inches to the foot.

   But where walls can conveniently be dispensed with, the embankments are to be permitted to take their natural slope.

6. Paved gutters are to be made across the road at such places as are designated in the field notes of the Engineer, and at such other places as may be found necessary for the preservation of the road.

   No gutter is to be less than 8 feet wide, to be increased in width in proportion to the quantity of water that may have to pass over them.

   The gutters to consist of a bed of gravel or broken stone not less than nine inches thick, held up by a wall across the lower end or protected by a pavement of large flat stone extending quite to the foot of the embankment.

   The depth of the gutter not to be more than one twenty-fourth part of their width, descending from the upper to the lower end, not more than two inches.

7. Culverts may be substituted for gutters at such places only as can be covered two feet thick with good materials, these dimensions and construction to be varied according to the localities of the place, but never to be less than 18 inches square in the opening.

8. Ditches are to be made on both sides of the roads, one foot wide and one foot deep, to be increased in dimensions as circumstances may make it advisable, to conduct the water that may collect on, or along the sides of the road, to the gutters or culverts, and thence into sufficient drains to carry off the water, so as to prevent as much as possible any abrasion of, or water soaking in to the road.

9. The bridge over Snow Creek is to be not more than 40 feet span, 15 feet high, and 18 feet wide in the clear.

   Abutments to consist of good dry masonry, at least two fifths of their height, thick, at the base, the bottom or first course of stones to be large and flat laid carefully on a solid foundation, and each successive course to consist of headers and stretchers alternatively.

   One header at least in every five feet of each course in the face of the abutments to bind well on the headers of the back courses, those headers to correspond with the middle of the interval between like headers in the preceding course.

   The wing walls to be of like masonry, raised one foot above the levels of the road, curved so as to suit the direction of the road approaching the bridge, and descending from the bridge at an angle of two degrees.

   On the top of the wing walls are to be laid good white oak sills, not less than one foot square to receive the hand railing.

   On the top of the abutments are to be laid good white oak sills, one foot square and 24 feet long. On those sills are to be laid 7 sleepers at equal distance from each other, of good white oak or white pine not less than 8 by 12 inches square, free from sap, injurious knot, split and unsound places.

   Across the sleepers 8 feet asunder are to be laid joists 5 inches square and 24 feet long of good white oak, let down by square notches, so as to bring the upper surface even with that of the floor, binding together the sleepers, and well pin'd with good locust pins through and through. The intermediate spaces between the joists being occupied by 2 ½ inch white oak plank sound, well seasoned, laid close, well pin'd with good locust pins, the planks of the floor to project 9 inches beyond the outer sleepers.

   Handrailing to consist of upright posts 4 by 5 inches square, inserted into the joists, sills on the wing walls, and braced into the projecting ends of the joists and sills, capped with a railing 4 by 5 inches square, and rounded on top, the spaces between the posts to be occupied by diagonal crosses, or upright balusters, all of good heart pine or poplar well painted.

   Great care is to be taken at al short turns to cut well round the axis of the road, the outer circle never being less than 100 feet in diameter.

These specifications take into consideration most of the significant items necessary for the construction of modern roads, including environmental factors such as shade trees.

Although a clearly stated and understood specification continues to be a vital requirement, perhaps of equal or greater importance is the need, in the words of the 1833 General Assembly, "to be able to contract with good and responsible individuals."

Build Us a Bridge

Howard H. Newlon, Jr.

["Backsights" No. 10: originally published in the *Bulletin*, November 1973]

The broadside pictured with this article is typical of the advertisements by which the local road commissioners in the late 19th century responded to the entreaties of the people to "build us a bridge." Many of the records of the County Boards and Courts deal with requests for improved transportation facilities of various kinds.

The evolution of bridges in Virginia, as throughout the nation, reflected developments in technology and changing requirements imposed by the users. Bridges were built only when the growing volume of transportation justified the expenditure of time and labor—labor that was also needed to obtain the bare necessities of life—food, clothing, and shelter. The first bridges were, no doubt, simple beam-type structures consisting of felled tree trunks supported at their ends and providing passage over small streams. When the width to be bridged exceeded the length of available trees, multiple-span structures were constructed with intermediate supports.

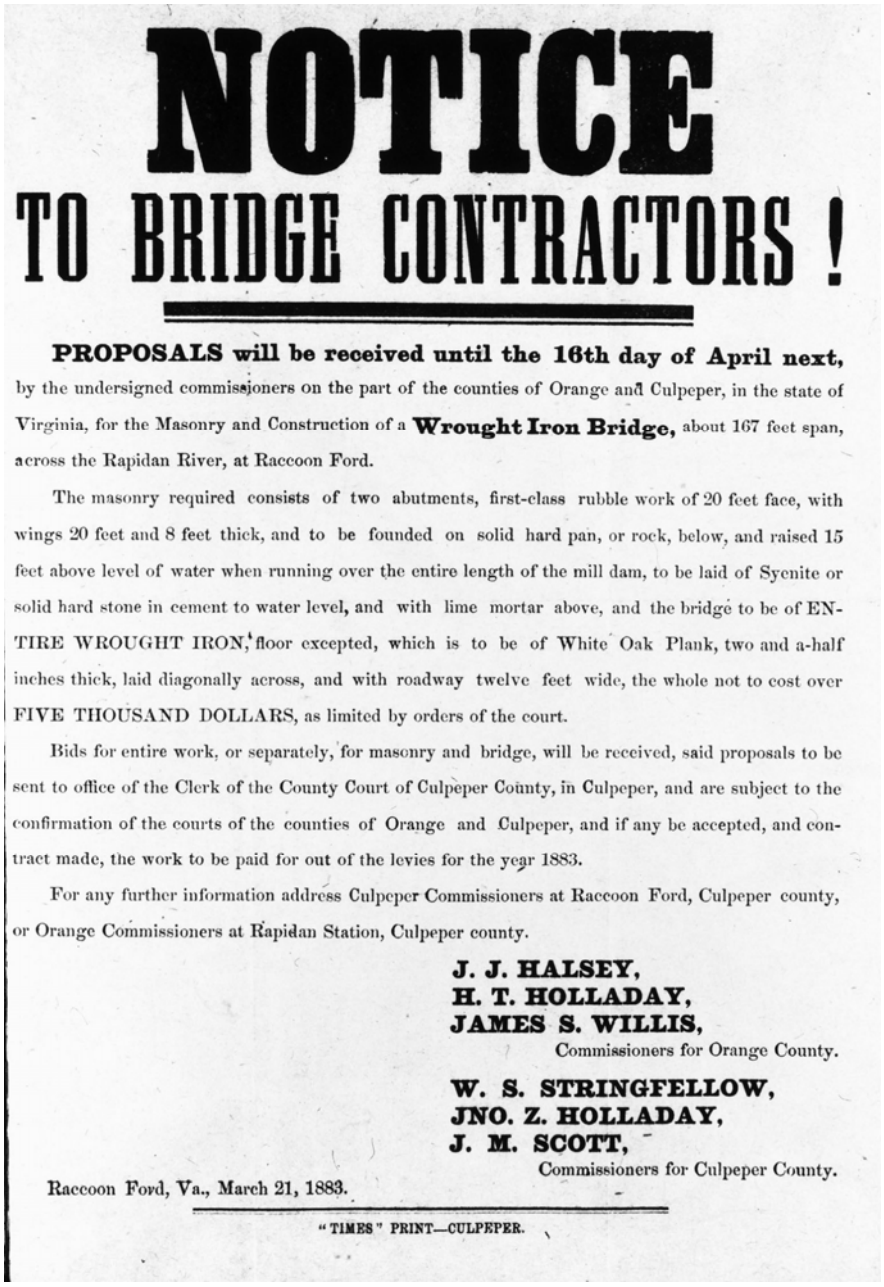
Stone masonry found limited use in abutments and piers, but the cost and time involved prohibited stone lintel and arch-type bridges. The construction of the bridges depended, in the main, upon the abilities and background of the locally available craftsmen. In 1785, Jefferson, in his *Notes on the State of Virginia*, said:

> Such bridges as may be built without the assistance of artificers, they (the local inhabitants) are to build. If the stream be such as to require a bridge of regular workmanship, the county employs workmen to build it at the expense of the whole county. If it be too great for the county, application is made to the General Assembly, who authorizes individuals to build it. . . ."

These bridges were undoubtedly built with minimal, if any, plans and specifications and depended upon the experience of the local builder. After 1816 the Board of Public Works through its principal engineer developed more detailed specifications, an example of which was given in the October 1973 "Backsights" ("With Good and Responsible Individuals").

As the longer and more sophisticated structures became necessary and as materials such as iron and later steel became available, patented designs and procedures developed. Long span wooden bridges, some covered, followed the principles developed by such men as Burr, Town, Howe, and Haupt, through whom during the 19th century there evolved a basic understanding of the science of bridge design.

In the latter half of the 19th century, spurred by the demand of the railroad for long spans to carry heavy loads along with the increasing availability of iron and steel, patents were issued in rapid succession for trusses identified with the name of inventors such as Howe, Pratt, Whipple, Bollman, and Fink.



NOTICE
TO BRIDGE CONTRACTORS !

PROPOSALS will be received until the 16th day of April next, by the undersigned commissioners on the part of the counties of Orange and Culpeper, in the state of Virginia, for the Masonry and Construction of a **Wrought Iron Bridge,** about 167 feet span, across the Rapidan River, at Raccoon Ford.

The masonry required consists of two abutments, first-class rubble work of 20 feet face, with wings 20 feet and 8 feet thick, and to be founded on solid hard pan, or rock, below, and raised 15 feet above level of water when running over the entire length of the mill dam, to be laid of Syenite or solid hard stone in cement to water level, and with lime mortar above, and the bridge to be of ENTIRE WROUGHT IRON, floor excepted, which is to be of White Oak Plank, two and a-half inches thick, laid diagonally across, and with roadway twelve feet wide, the whole not to cost over FIVE THOUSAND DOLLARS, as limited by orders of the court.

Bids for entire work, or separately, for masonry and bridge, will be received, said proposals to be sent to office of the Clerk of the County Court of Culpeper County, in Culpeper, and are subject to the confirmation of the courts of the counties of Orange and Culpeper, and if any be accepted, and contract made, the work to be paid for out of the levies for the year 1883.

For any further information address Culpeper Commissioners at Raccoon Ford, Culpeper county, or Orange Commissioners at Rapidan Station, Culpeper county.

J. J. HALSEY,
H. T. HOLLADAY,
JAMES S. WILLIS,
Commissioners for Orange County.

W. S. STRINGFELLOW,
JNO. Z. HOLLADAY,
J. M. SCOTT,
Commissioners for Culpeper County.

Raccoon Ford, Va., March 21, 1883.

"TIMES" PRINT—CULPEPER.

The Raccoon Ford bridge broadside.

Initially, individuals such as the Chenoweth Brothers and subsequently companies with names like Champion, King, and Variety developed the special expertise and experience to build bridges to meet the expanding needs. After the Civil War, when the construction of roads and bridges returned essentially to local control, the local commissioners became more and more dependent upon these companies to furnish the technical expertise. In the last quarter of the 19th century, the companies supplied bridges to meet needs such as stated in the broadside issued from Raccoon Ford. In many cases, companies would present from their "catalogs" a variety of bridges from which the commissioners selected the best to meet the physical and fiscal requirements.

A substantial number of the metal trusses from the period 1880-1905 survive and are currently the object of specific study by the Research Council. Unfortunately the survival rate of the various catalogs issued by the companies was not as high as that of the structures.

The initial survey of the counties in the Staunton District has identified six Ohio, two Pennsylvania, and one New York based companies represented by the surviving metal truss spans that predate the formation of the Highway Department. It is hoped that future efforts will be successful in locating from various sources information on these responses of the companies and individuals who responded to the call to "build us a bridge."

[NOTE: The survey noted in this article marked the beginning of the first survey of early metal truss bridges in any state in the United States. This survey and subsequent studies by the Virginia Transportation Research Council (now the Virginia Center for Transportation Innovation and Research) have covered Virginia's metal truss bridges, arched stone masonry and arched concrete bridges, non-arched concrete bridges, covered bridges, and movable span bridges, in addition to other subjects.]

Citizen Tom Paine: Bridge Engineer

Howard H. Newlon, Jr.

["Backsights" No. 11: originally published in the *Bulletin*, December 1973]

Students of history learn early that pamphleteer Thomas Paine through his writings, particularly *Common Sense* and *Rights of Man,* exercised a unique influence upon the struggle for independence in both America and France and to a lesser degree in several South American countries. But few realize that soon after the new nation was born, his agile mind and drafting pen were busy producing various plans for intricate wooden and iron bridges. A contemporary of and correspondent with men such as Franklin, Jefferson, and Washington, his place in the history of political revolution is assured. Less widely appreciated is his early association with another revolution—the introduction of iron as a material for building bridges. Yet on the day after Christmas, 1786, Paine, Franklin, and others were gathered for a demonstration of his model of a single iron arch span which Paine had brought by sled to Franklin's house. It is interesting to those associated with technology that during this period almost as large a portion of his correspondence with the founding fathers was devoted to his bridge building efforts as to the changes taking place in world governments.

[*Image in original:* Engraving of Thomas Paine. *No caption.]*

Paine's deepening involvement in the French Revolution interrupted and apparently ended his extended efforts in the United States, France, and England to finance the construction of an iron bridge of his own design. Had his efforts been successful, he would have been credited with the world's second iron bridge (the first was completed in 1779 at Coalbrookdale in England). One of Paine's biographers has perhaps overzealously characterized him as "one of the leading bridge engineers of his day." While his efforts as a bridge builder were much less successful than his efforts to build new systems of government, they provide an excellent example of the versatility typical of many of the founding fathers and of their interest and competence in technology as well as politics.

Paine was born in England in 1737, the son of a corset maker, a trade into which he was apprenticed when he left grammar school at the age of thirteen. Afterwards his innate scientific ingenuity was refined largely through self-study.

After several dismissals from government service as a customs inspector and his second unsuccessful marriage, Paine arrived in Philadelphia in the fall of 1774 bearing letters of introduction from Benjamin Franklin, who was in London at the time. He came with the expressed purpose of establishing "an academy on the plan they are conducted in and about London, which I was well acquainted with." Engaged, largely through Franklin's influence, as a tutor for students in Philadelphia, he soon developed a literary reputation which gradually led to his becoming an editor and then publisher of periodicals and newspapers. It was from this base that his famous writings, credited with greatly uplifting the morale of the American forces during the difficult winter of 1778, emanated.

Following the American Revolution, Paine's interest in bridges emerged. After observing the icepacks in the Schuylkill River, he wrote that it was "impractical to erect bridges on piers." He adopted the idea of spanning the river with a single arch, stating that "the principle I took to begin with and work upon was that the small segment of a large circle was preferable to the great segment of a small circle." Ultimately he produced several models which he literally carried from country to country in attempts to obtain funds and authority for construction.

Of his initial plans to bridge the Schuylkill, he wrote, "The river can conveniently be contracted to 400 feet, the model therefore is for an arch of 400 feet span; the height of the arch in the center, from the chord thereof, is to be about 20 feet and to be brought off on the top, so as to make the ascent about 1 foot in 18 or 20." This plan was an outgrowth of an earlier plan to manufacture a bridge composed of a single arch combining a number of separate sections. This 300-foot structure was intended to span the Harlem River north of New York City and was to have been constructed of wood. He later took his models to England and France and advanced plans for erecting iron bridges across the Thames and Seine.

Influenced by his actions in the political sphere, he affectionately called one of his bridges a child of "common sense" and devised its arch of "thirteen ribs, in commemoration of the thirteen United States." He took the idea of his bridge "from a spider's web of which it resembles a Section." He supposed that "when Nature enabled the insect to make a web, she taught it the best method of putting it together." Nature also provided another of his ideas, "that of increasing the strength of matter by causing it to act over a larger space than it would occupy in a solid state, as is evidenced in the bones of animals, tails of birds, reeds, canes, etc., which were they solid with the same quantity of matter, would have the same weight with much less degree of strength." This concept was not original with Paine but aligns him squarely with those such as Fuller and Nervi who subsequently applied organic principles to structural design.

Paine likewise was not the inventor of the arch nor of the iron bridge, but the daring of his projects and his early use of iron set him apart as an innovator and practitioner of advanced technology. The patron upon whom he had counted for funds for his Schuylkill project suffered severe financial losses, and distrustful of the Pennsylvania Assembly, Paine determined to try his luck in France. In France he received the endorsement of the French Academy of Sciences as well as the active support of Jefferson and Lafayette, but despite these strong allies his efforts proved futile with the French court and he then decided to concentrate his efforts in England.

In England, he engaged the eminent iron works of the Walker Brothers, where an experimental 90-foot rib of an iron arch was fabricated and extensively tested. During the tests the works were visited by numerous scientific and political figures. One, Lord Lansdowne, thought that Paine might successfully bridge the Atlantic, reconnecting England and America.

His efforts are fully documented in extensive correspondence with Jefferson and other scientific figures and in a memoir to the U.S. Congress written in 1803 "as evidence that this new method of constructing bridges originated in America."

In one exchange Jefferson proposed that Paine use an exact catenary, which he had learned was "in perfect equilibrium." As for some of Paine's other suggestions, Jefferson

conceded that "the practical iron men are much better judges than we theorists." Paine responded that from his measurements "the catenary appears to me to unite with the arch of the circle or exceedingly nearly thereto so that I conclude that the treatises on catenarian arches apply to the semicircle or a very large portion of it." Paine was desirous of keeping the radial supports of equal length and continued to use the circular arch.

After several years of experiments interspersed with various political activities in London, he wrote, "On the success of this experiment, I entered into an agreement with the iron-founders at Rotherham to cast and manufacture a complete bridge, to be composed of five ribs of 210 feet span, and 5 feet of height from the chord line, being a segment of a circle 610 feet diameter, and sent it to London to be erected as a specimen for establishing a manufactory of iron bridges to be sent to any part of the world."

The demonstration bridge was erected in August 1790, "in a plain field where no advantage could be taken of butments without the expense of building them . . . ." As a result of an accident to his foreman, Paine had to assume direct responsibility for supervising the construction. Apparently the construction effort attracted considerable public attention, for Paine wrote that "the only way to render admission convenient will be by tickets and then people will not be consulting with themselves as to what they are to give." After about one month's experience Paine appeared to be satisfied with his efforts as he observed, "I am always discovering some new faculty in myself either good or bad—and I find I can look after workmen much better than I thought I could."

One aspect of Paine's bridge which presaged modern developments was the fact that it was portable. He wrote, "It renders bridges capable of becoming a portable manufacture, as they may, on this construction, be made and sent to any part of the world ready to be erected." After a year of demonstration during which Paine successfully attempted to gain approval for the financing and erection of the prototype, the span was taken down and the iron apparently reclaimed by the Walker Brothers. Paine felt in his words that the bridge would "produce a pretty general revolution in bridge architecture."

But Paine's intense championing of the cause of the common man against the Crown once again effectively removed his source of funding. Paine was convinced that the failure of his bridge building project was the result of Edmund Burke's attack on the French Revolution and his own subsequent defense of representative government. He wrote: "The publication of this work by Mr. Burke, absurd in its principles and outrageous in its manner, drew me, as I have said, from my bridge operations, and my time became employed in defending a system then established and operating in America, and which I wished to see peaceably adopted in Europe. I, therefore, ceased my work on the bridge to employ on the more necessary work, 'Rights of Man,' in answer to Mr. Burke." Even then the bridge construction effort was "crisis oriented."

In addition to Paine's efforts toward the construction of an iron bridge—efforts completely documented in his patent applications, memoirs, and correspondence—he may have been, as one authority suggests, the author of the anonymous design for a bridge over the Schuylkill in Philadelphia which appeared in the *Columbian Magazine* in 1787. The design was for a four-span wooden bridge unique in that it was to be covered. This was the first published

U.S. covered bridge design. Although Paine is associated with this design only by circumstantial evidence, it is typical of his career as a bridge engineer in that the covered structure, like his iron bridges, was never built but its innovative character served as the model for subsequent developments.

The approaching Bicentennial observance will bring with it a renewed focus upon the lives and contributions of the founding fathers. Undoubtedly, the emphasis will be upon their involvement in the political sphere. But those of us associated with technology can take justifiable pride from the fact that many of these men would be much honored by designations such as Franklin, inventor; Jefferson, scientist and architect; Washington, surveyor; and Thomas Paine, bridge engineer.

Transportation Departments—Full Cycle?

Howard H. Newlon, Jr.

["Backsights" No. 12: originally published in the *Bulletin*, January/February 1974]

Consideration by the General Assembly of legislation to create a Department of Transportation for Virginia reflects a trend which began in 1959 with Hawaii, and which by the beginning of this year [1974] has seen 23 states establish such organizations. Is the concept of a single agency to deal with the various modes of transportation a modern one? Certainly not in Virginia! More than a century and a half ago the General Assembly created the Fund for Internal Improvement and the Board of Public Works to answer Virginia's need for better land and water transportation through internal improvements that included canals, railroads, turnpikes, and bridges. This Board, authorized in February 1816, functioned with periodic modifications until 1902. It was the first such body constituted in the U.S. In numerous ways it influenced philosophically and physically the development of all forms of transportation in the Commonwealth.

Prior to the War of 1812, transportation facilities in Virginia, like those in the rest of the nation, consisted of natural waterways and roads of varying serviceability. A nationwide survey of transportation facilities reported by Albert Gallatin, Secretary of Treasury in 1808, lists for Virginia only three turnpikes: the Little River Turnpike, between Alexandria and Middleburg, and two turnpikes in the Manchester area south of Richmond leading to coal mines. Gallatin also describes the Dismal Swamp Canal construction in progress. Prior to 1816, fewer than ten turnpike companies had been incorporated by the General Assembly, although numerous toll road charters had been granted. The James River Company had been chartered in 1785, had completed a canal at Richmond, and improved the James for batteau navigation to Buchanan.

Some roads were authorized and constructed under the guidance of the General Assembly, but most local roads and bridges were constructed and maintained as described by Jefferson in 1785 in his *Notes on the State of Virginia*. After describing the navigation of the rivers, Jefferson wrote:

> The roads are under the government of the county courts, subject to be controlled by the general court. They order new roads to be opened wherever they think them necessary. The inhabitants of the county are by them laid off into precincts, to each of which they allot a convenient portion of the public roads to be kept in repair. Such bridges as may be built without the assistance of artificers, they are to be build. If the stream be such as to require a bridge of regular workmanship, the county employs workmen to build it at the expense of the whole county. If it be too great for the county, application is made to the General Assembly, who authorizes individuals to build it, and to take a fixed toll from all passengers, or given sanction to such other propositions as to them appears reasonable. Ferries are admitted only at such places as are particularly pointed out by law, and the rates of ferriage are fixed.

All roads in Virginia were the outgrowth of the first highway law in the New World, which had been passed by the House of Burgesses in 1632. This law, the epitome of simplicity, said in its entirety:

> Highways shall be layd out in such convenient places as are requisite accordinge as the Governor and Counsell or the commissioners for the monthlie corts shall appoynt, or accordinge as the parishioners of every parish shall agree.

After the War of 1812, freed from many of its European ties, the nation turned enthusiastically toward westward expansion and to developing more effective means of internal transportation, particularly canals and turnpikes. When the Virginia Board of Public Works was formed in 1816, only about 100 miles of canal had been constructed in the United States. One year later, legislation in New York authorized construction of the Erie Canal. The formation of the Board of the Public Works thus coincided with the beginning of the nation's canal era.

The Board included the Governor as president. He was assisted by directors consisting of the Treasurer, the Attorney General, and ten other citizens to be chosen annually by joint ballot of the Senate and the House of Delegates. The Board was responsible for chartering, funding, and supervising the internal improvements. The Fund, which totaled over a million dollars, was created by transfer of shares held by the state in the stock of the Little River Turnpike Company, the Dismal Swamp, Appomattox, Potomac and James River Canal Companies, the Bank of Virginia, and the Farmer's Bank of Virginia. The proceeds of the Fund were used to match private capital under a specified procedure. Virginia was the first state to develop, and the only state to apply for the duration of the entire ante-bellum period, the principle of "mixed enterprise"—a combination of public and private enterprise—to her internal improvements program.

The technology associated with the location, design, and construction of transportation facilities in Virginia came from the office of the principal engineer, and during its formative years this office was filled by two individuals of considerable national reputation. The first, appointed in 1816, was Laommi Baldwin, Jr. He would thus qualify for the title of "Virginia's First Transportation Engineer." Baldwin, whose father was also an outstanding civil engineer, resigned in 1818 and concentrated his activities on various projects in the Northeast. He was succeeded by Thomas Moore, an inventor who claimed among his credits a patent on the first refrigerator in the U.S. as well as service as engineer on the National Road. Moore was born in Waterford, in Loudoun County, in 1760 and died in 1822. After Moore's death his brother-in-law, Isaac Briggs, was appointed acting principal engineer. Briggs had laid out the streets of Washington and had been appointed by Jefferson as surveyor general of the Louisiana Purchase. Then came the second truly national figure and the man who perhaps had the greatest impact of any individual upon transportation engineering in Virginia, Claude Crozet. Crozet served two terms, 1823-31 and 1838-43. The hiatus in his service in itself reflects the continuing dilemma of those laced with the responsibility of applying the results from rapidly changing technology to large-scale public works, and the reasons for it are worthy of brief elaboration.

Much of the Board's transportation policy was guided by the need to establish communication and trade between populous and politically powerful eastern Virginia and the rapidly developing but comparatively isolated Trans-Allegheny region. The Board's major effort was the design and construction of the James River and Kanawha Canal. The canal had been begun in 1785 by the James River Company under its president, George Washington, and though prosperous, it had not progressed as rapidly as its promoters had hoped. An even more serious obstacle to its success was developing, however, because in August 1829, the "Stourbridge

Lion," an early locomotive, was imported to the United States; and in 1830 Crozet suggested that as a consequence of the recent invention of the locomotive, a railroad would be the most suitable method of transportation from the western terminus of the canal to the Kanawha River. No railroad using steam locomotives had operated in the United States at the time, so this was a bold recommendation. Crozet's vision and attempt to utilize this latest technological development put him at odds with powerful forces in the General Assembly, particularly Joseph C. Cabell, whose allegiance was to completion of the partially finished canal. Benjamin Wright (see "Backsights," December 1972) was employed in July 1831 to ascertain "with the principal engineer of this state, during the present year" the best route and mode of uniting the eastern (James River) and western (New River) waters.

Largely as a result of the controversy growing out of the Crozet proposal, the Board of Public Works was reorganized in 1831 with a requirement for annual approval of the principal engineer by the legislature. Also, Crozet's salary was reduced from $3,500 to $2,500. He resigned at the end of 1831 and spent the next six years in Louisiana. He returned to the position of principal engineer at the beginning of 1838 and remained in the post until 1843.

Although Crozet's recommendation for railroads as a better solution to Virginia's transportation needs than canals was ultimately vindicated, partisan controversy continued and culminated in 1843 with an act stating "that the office of chief engineer of the state be and the same is hereby abolished." A year earlier, his salary had once again been reduced, this time to $2,000.

The records of the Board of Public Works as well as those of the General Assembly are filled with extended discussions of bond financing vs. pay-as-you-go, state vs. private development of roads, requirements for tolls vs. free access, criticisms that some sections of the state received more than their share of funds while others received less, and many other now current questions.

Early design and construction specifications are also of technical interest and several have appeared in prior "Backsights."

Changes in transportation technology and political events brought about changes in the Board. At the close of the Civil War the dismal physical and fiscal state of the turnpikes resulted in their being for the most part returned to local control. The canal era was also ended. In 1877 the Office of Railroad Commissioner was created. In the new constitution of 1902, the State Corporation Commission assumed the duties and powers of the railroad commissioner and the few remaining responsibilities of the Board of Public Works. This realignment of responsibilities preceded by four years the formation of the Virginia Highway Commission.

Those faced with the numerous and complex problems and possibilities of modern transportation can gain valuable insights and perspectives, as well as much moral support, from the records of those who faced many similar issues a century ago. There is much truth in Patrick Henry's words: "I know of no way to judge the future but by the past."

Lemuel Chenoweth: Pioneer Covered Bridge Builder of Western Virginia

Emory L. Kemp

["Backsights" No. 13: originally published in the *Bulletin*, March 1974]

[NOTE: At the time this article was written, Emory L. Kemp, the author, was Professor and Chairman, Department of Civil Engineering, West Virginia University. He subsequently was involved in the 1991 reconstruction of the Phillipi Bridge (following the 1989 fire that severely damaged the structure). He later was instrumental in the restoration of the Barrackville Bridge in 1999.]

From the close of the Revolutionary War right up to the Civil War, leaders in Virginia were concerned with the development of adequate transportation systems which would cross the Appalachians and link Virginia directly with the Ohio and Mississippi Rivers.

New York had the Erie Canal, Pennsylvania had constructed a combined rail and canal system linking Philadelphia with Pittsburgh, and Baltimore was served by the National Road and later by the Baltimore and Ohio Railroad. Each coastal city saw its future as a port and commercial center in terms of a link with the West. Richmond was no exception.

As a result, in Virginia various transportation schemes were tried including canals, roads, and combinations of canals and roads. Later, railroads were to provide the most satisfactory means of transportation across the mountains to the Ohio River until the development of modern high speed highways. Three early routes are particularly noteworthy: the James River and Kanawha Turnpike, which was first authorized in 1785; the Old Northwestern Turnpike, which was associated with both George Washington and Claude Crozet; and the Staunton and Parkersburg Turnpike. This last turnpike was authorized by an act of 1823 that directed the Virginia Board of Public Works to undertake preliminary surveys to establish the route. The road was many years under construction, with building being carried on simultaneously in a number of counties. As late as 1860 acts were still being promulgated for reconstruction and repairs of the turnpike. The construction of the turnpike was more a continuous process than a short-term project. In an effort to provide suitable bridges all along the western portion of the road the Board of Public Works advertised for bids for the construction of timber bridges.

At this point a little known wagon maker and carpenter entered the story. Lemuel Chenoweth was born near Beverly, Virginia (now West Virginia), in 1811. Like Abraham Lincoln he received little formal education. (The local schools, at the time, were supported by funds from state penalties and fines and were at best limited and irregular.) However, as a boy he developed a considerable local reputation for his mathematical prowess. He was largely self-taught. Apart from wagons and furniture, Chenoweth had built several small timber bridges in the Weston area. Thus, when the time came to bid on the proposed bridges for the center section of the Staunton and Parkersburg Turnpike, he decided to try his hand. In his book on *Covered Bridges in West Virginia,* Calvin R. Conaway relates what has become an Appalachian folk legend:

Lemuel Chenoweth

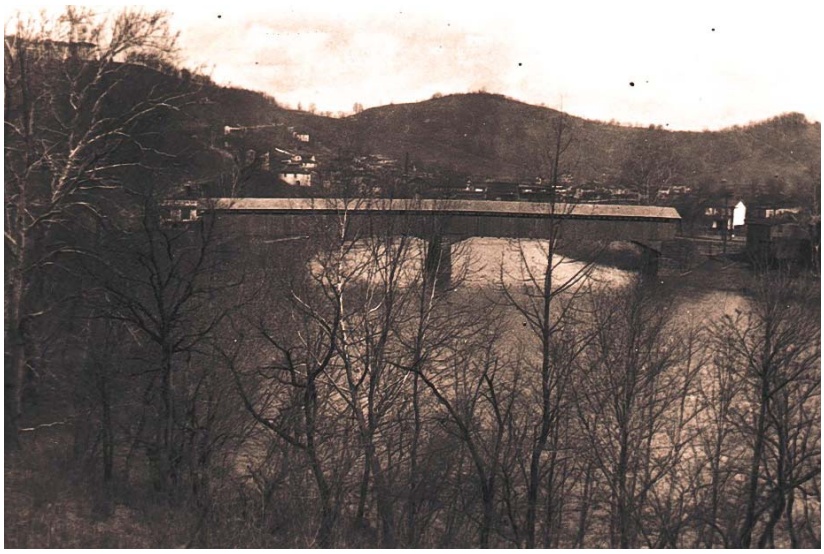
How Lemuel Chenoweth got the contract to build bridges for the State of Virginia is one of the famous stories connected with covered bridges in West Virginia. Sources of information vary as to the details but the main points are well established.

Although records in Richmond credit Lewis Wernwag with having designed the wooden-arch type of covered bridge, a story current in West Virginia relates that Chenoweth, a cabinet-maker by trade and a student of mathematics, arrived in Richmond in 1850 with a model of his bridge packed in his saddle bags. Bidders were present in large numbers from the east and north to get the bid for the construction which had been highly advertised. Many types of models were presented including iron structures, wire cables, cantilevers, stone arches, and many kinds of wooden bridges. Before the Board of Public Works of the Commonwealth of Virginia, then considering bids for the construction of bridges on the Staunton-Parkersburg Turnpike, Chenoweth assembled his model, "made of poplar, and nary a nail in 'er." Each bidder showed his model and set forth his claims of what weight his bridge would sustain. Mr. Chenoweth was one of the last called forward to show what he had. His plain wooden model didn't attract much attention but he created consternation among the other bidders when he placed his model between two chairs, stood upon it, and challenged the other bidders to put their models to the same test. Not one would do it, for they knew their models would be crushed. That he won the contract through this test has been disputed but he did build many covered bridges in West Virginia between 1851 and his death in 1884.

Just how many bridges were built by Lemuel Chenoweth under the contract with the State of Virginia or during his lifetime is undetermined. There is definite information from good sources that he built the following bridges: Philippi and Middle Fork, Barbour County; Barrackville, Marion County; Beverly, Randolph County; Weston, Stone Coal Creek, and Polk Creek, Lewis County; Buchannon, Upshur County; and the Greenbrier bridge at Marlington, Pocahontas County. Of the nine named the first five are still standing although the one at Beverly was rebuilt by Chenoweth in 1872-73. There is reason to believe that he also built three other bridges in Lewis County. An act was passed by the Virginia legislature in 1847 to build the bridge at Weston and the one across Stone Coal Creek and in 1848 the one across Polk Creek. Under this same act funds were provided for the building of three other bridges; one over the Tygarts Valley River at Huttonsville, one over the Hughes River, and one over Alum Fork. None of the three are still standing, however.

Of all of Chenoweth's bridges, only two—and they are among his most important—remain. They are located at Philippi and Barrackville, West Virginia. Both are constructed on the Burr System.

The Philippi bridge was built in 1852 and was used by both Confederate and Federal troops for the transportation of men and supplies during the Civil War. The first land battle of the War occurred at Philippi on June 3, 1861. Confederate troops under Colonel Porterfield were routed by Federal troops from General McClellan's army under Colonel Kelley. It was really a minor skirmish but McClellan made much of it.



Philippi Bridge

The handsome arch-truss design is "double-barreled" and has two spans, each 138 feet, 8 inches. The superstructure was constructed of clear yellow poplar. The abutments and central pieces were constructed by Emmett O'Brien. In 1934 the bridge was extensively overhauled with a reinforced concrete deck, supported on steel beams supported in turn by the original abutments and pier, and two additional new piers. The result is a bridge within a bridge since the timber arch-truss no longer carries vehicular loads.

The second extant structure is the bridge at Barrackville on the Fairmont and Wheeling Turnpike. This bridge was under construction while Chenoweth was still engaged on other bridges on the Staunton to Parkersburg Turnpike. On April 25, 1853, a contract was made between Austin Merrill, the superintendent of the Turnpike appointed by the president and directors of the Board of Public Works of Virginia, and Lemuel and Eli Chenoweth for the construction of the superstructure by December 1, 1853, if the abutments were finished by September. Thus, the builders had only two and one half months to complete all of the timber work.

The contract provision for the conduct of employees is of considerable interest in light of today's labor agreements. It says in part:

If any workman, labourer, or other persons employed in the execution of the work herein contracted for shall willingfully insult or maltreat travellers or others passing along, or shall be habitually intemperate, disorderly or unfaithful in this work the superintendent shall have the right forthwith to dismiss the offender from employment on the said work.

The accompanying interior view illustrates the details of the main truss and the framing of the sides and roof. The bridge is in essentially original condition and is a magnificent example of a Burr arch-truss. All of the main timbers were cut out of solid yellow poplar whereas the treenails (pronounced "trunnels")—the pegs used in the joints—are oak. The workmanship throughout is really first class and worthy of the New England shipwright tradition which gave birth to the timber bridge in this country.

Barrackville Bridge

The contract states that:

The said Austin Merrill superintendent as aforesaid for and in behalf of the said President and Directors and for and in consideration of the work and labour herein before agreed to be done by and on the part of the said Eli and Lemuel Chinowith [note the misspelling—this occurs throughout the document] agrees and binds the said President and Directors to pay the said Eli & Lemuel Chinowith the sum of twelve dollars and fifty cents per foot lineal measure in the manner following viz. Whenever the said Chinowiths shall have done to the amount of five hundred dollars worth of labour on said bridge they shall be entitled to a draft on the board of Public Works for four hundred dollars the said reservation of twenty-five per centum [evidently a mistake was made here, since the one hundred dollar reservation is actually 20 percent] which sum shall be kept by the President and Directors of the Board of Public Works as a standing guarantee for the faithfull execution of the work aforesaid until the final completion and reception of the same at which time the Chinowiths shall be entitled to receive said reservation or percentum reserved as aforesaid.

Many of the early covered bridges are credited to Louis Wernwag, including several of Chenoweth's bridges. Wernwag certainly was one of the most renowned bridge builders and was responsible for several outstanding bridges in Virginia. Nevertheless, because of the number and quality of bridges constructed by Lemuel Chenoweth, he richly deserves the title of Pioneer Bridge Builder of Western Virginia.

Current work on Chenoweth includes a complete structural analysis of the Barrackville bridge and research on Chenoweth and his covered bridges. Thus, any information on the subject would be most appreciated by the writer.

Acknowledgments

The writer acknowledges the research on the Barrackville Bridge by R. A. Smith of Wheeling. The Barrackville and Philippi bridges are listed on the National Register of Historic Places. In the case of the latter, a complete set of measured drawings, photographs, and a historical text have been prepared by the Historic American Engineering Record of the U.S. Park Service. The West Virginia H.A.E.R. Survey was jointly sponsored by the U.S. Park Service, the West Virginia Department of Natural Resources, and the Department of Civil Engineering, West Virginia University.

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The Plank Road Craze

Howard H. Newlon, Jr.

["Backsights" No. 14: originally published in the *Bulletin,* April 1974]

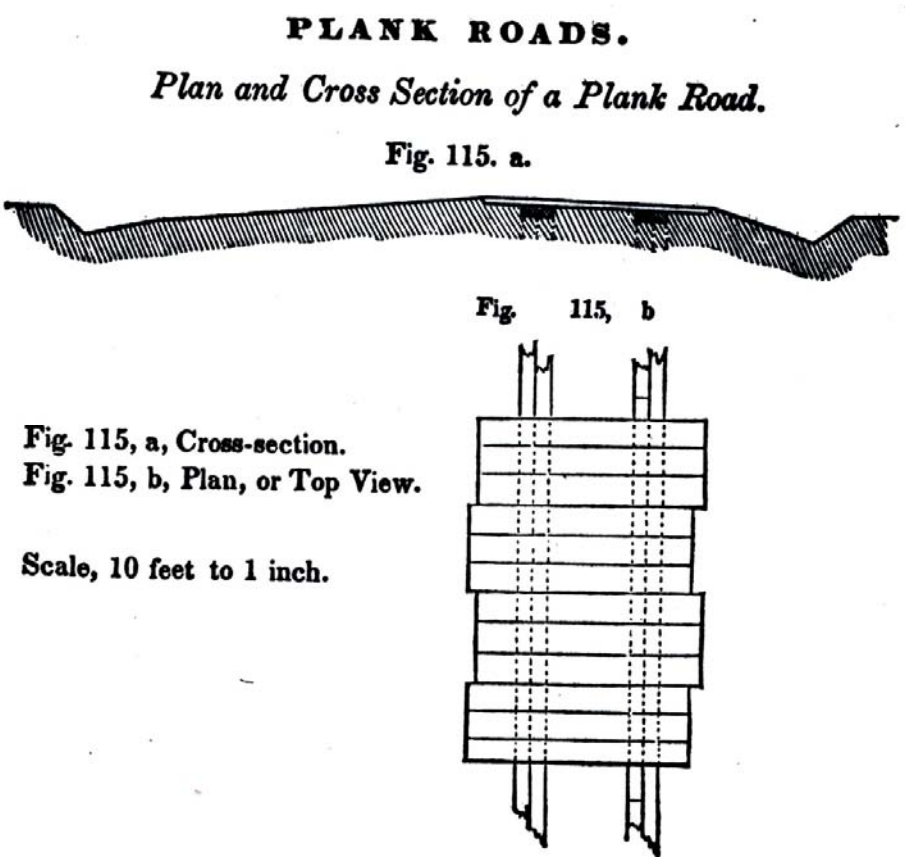
The search for a durable and economical paving material has occupied a major portion of the attention of road builders since the use of wheeled vehicles dictated an increased need for all-weather surfaces. A variety of materials and systems have been and continue to be proposed as *the* answer, but only a very few have actually fulfilled the promise of their promoters. As technology has become more sophisticated, so have the materials and processes proposed, but for a brief period during the mid-nineteenth century a large segment of the country was convinced that the final answer had been found: namely, wood.

This wood was used to construct several thousand miles of plank roads throughout the country, with particular concentrations in New York and several Midwestern states. The first U.S. plank road was apparently built in Syracuse, New York, in 1837 by George Geddes. The previous year the first plank road in North America had been built in Toronto, Canada. There are indications that the process was brought to Canada from Russia, but the evidence has not been definitely confirmed.

The extent to which the method captured the attention of road builders and road companies is shown by a quote from W. M. Gillespie's 1854 *Manual of the Principles and Practice of Road Making,* a popular and comprehensive treatise on all aspects of road building. Gillespie wrote: "The most valuable improvement since McAdam's, and one superior in many localities, is the recent invention of covering roads with planks."

He goes on to describe the process: "In the most generally approved system, two parallel rows of small sticks of timber (called indifferently sleepers, stringers, or sills) are imbedded in the road, three or four feet apart. Planks, eight feet long and three or four inches thick, are laid upon these sticks, across them, at right angles to their direction. A side track of earth, to turn out upon, is carefully graded. Deep ditches are dug on each side, to ensure perfect drainage; and thus is formed a Plank Road."

Gillespie's diagram is shown in the accompanying illustration. The diagram and description emphasize the distinction between plank and "corduroy roads." The latter technique involved the laying of poles across swampy areas and then covering them with earth. One of the primary advantages, on the other hand, of a plank road was the smooth wearing surface provided by the sawed timbers, which permitted the movement of large loads as compared with those that could be pulled on rougher surfaces. One account from New York describes the feat of a two-horse team hauling six tons of iron 12 miles to Syracuse at the rate of three quarters of a mile per hour. The account stated that the limiting factor was the strength of the wagon, not that of the team or roadway. During the four years following the initial trial near Syracuse, more than 2,100 miles were constructed in New York State, with lesser amounts being built in other areas. Several states, including Indiana, passed general plank road laws. Robert Dale Owen, son of the



Plan and cross section of a plank road, from Gillespie's *Manual of Road Making*, 1854.

utopian socialist founder of New Harmony, Indiana, authored a treatise in 1850 on plank roads that summarized the laws of New York, Kentucky, Indiana, and Illinois.

The perishability of wood, particularly in contact with soil, causes the modern engineer to doubt the wisdom of his forebears, but a study of contemporary accounts suggests that the builders were actually early practitioners of a modern concern: cost-benefit analysis. The accounts are replete with extensive cost analyses which suggest that the decision to build plank roads was controlled by economic factors that overcame the recognized limited life of the wood. Initial costs per mile were from $1,500 to $1,800, as compared with $3,500 to $4,000 for macadamized surfaces. It was postulated that the roads would last seven years, after which they would be resurfaced. Since most were built by private companies and amortized by tolls, the paramount question was: "What will be the return on the investment?" In some cases, the return was upwards of 30 percent per year. Thus, the promoters "laughed all the way to the bank." This high return reflected both the comparatively low first cost and the fact that the smooth surfaces easily attracted commercial freight and farm traffic, because they were greatly preferable to the alternatives. Since most of the roads were built through wooded areas, the materials were readily available at the point of construction. The attraction of the smooth surfaces for commercial traffic produced excellent tolls in many areas, as reflected by the fact that the first road near Syracuse carried 161,000 teams (at a base toll of 1½ cents per mile) during the first two years. This traffic was reported to have caused a wear of one inch.

The roads were locally called the “farmer’s railroads.” This designation reflected the wide use of the roads by farmers to haul products to and from markets, and, strange as it may seem, the fact that these roads competed with the developing railroad system rather than with the other roads for freight traffic. In some states, particularly in the South, they impeded railroad development. In Alabama, for example, a railroad company incorporated in 1834 redirected its efforts to a plank road instead.

While a number of plank roads were built in Virginia, the attitude was at best one of cautious optimism. In its annual report for 1851, by which time the zenith of the plank road effort had really waned nationally, the Board of Public Works included reports from two plank road companies, and stated: “In Virginia they are but experiments whose every step is attended by doubts, but their success which may now be regarded as inevitable will be the dawn of a new era.”

No inventory of plank roads in Virginia has been found, but contemporary maps and records contain numerous references such as Jerusalem Plank Road, Staunton and James River Plank Road, and Westham Plank Road. Companies constructing connecting facilities included the Boydton and Petersburg Plankroad Company and the Lewiston Plankroad Company. Although the roads are long since gone, vestiges remain in some areas where current roads carry the local designation “the plank road.”

Perhaps the fact that plank roads were not developed as extensively in Virginia as in other areas can be traced to the long tradition of macadam construction begun by Baldwin and Crozet, plus the extensive system of road and water routes that was already in operation in eastern Virginia, where the most demanding commercial markets were located. The beginning of plank roads in the United States is precisely identified, but their demise was gradual. Few appear to have been built after the late 1850s. While the glowing promise of plank roads was not fulfilled, for about a decade they were an important economic force in the developing campaign to “get the farmer out of the mud.”

Thomas Telford—The Colossus of Roads

Howard H. Newlon, Jr.

["Backsights" No. 15: originally published in the *Bulletin*, May/June 1974]

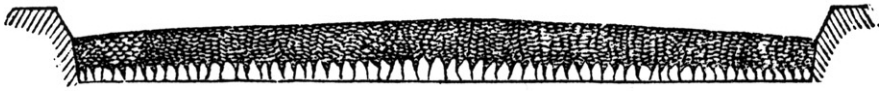
During the initial years of the formal statewide road building effort begun by the Board of Public Works in 1816, Virginia was indeed fortunate that the first three principal engineers—Baldwin, Moore and Crozet—brought to their task a thorough knowledge of the latest principles of road building. These principles were largely based upon the experience and engineering genius of two Scotsmen born a year apart and whose names, Telford and McAdam, even today describe types of road construction they developed. That they lived during an extraordinary period of technological development—the Industrial Revolution—undoubtedly served as an incentive to their genius. This period also produced, among others, John Smeaton, the first person to use the title "civil engineer"; bridge builders George Stephenson and John Rennie; steam engine inventor James Watt; and iron masters Abraham Darby and John Wilkinson. But Telford and McAdam were unusual men who were equal to their tasks and to whom American and other road builders trace their heritage.

Thomas Telford was born, the son of a shepherd, in Eskdale, Dumfriesshire, Scotland, in 1757. The death of his father during his first year meant that he was destined for minimal formal schooling. After completing parish school at the age of 14, he was apprenticed as a stone mason and plied his trade in Scotland until the age of 25, when he went to London. There he won a contract to repair the castle of Sir William Pulteney, a member of Parliament. Through the sponsorship of Pulteney he was later made surveyor of public works for Salop and then, in 1793, was made engineer for the Ellesmere Canal. The latter assignment brought him into the field of transportation and assured his career. He designed and supervised a number of large public projects including a variety of roads and bridges.

[*Image in original:* Engraving of Thomas Telford. *Caption:* A portrait of Thomas Telford from the 1836 "Transactions" of the Institution of Civil Engineers.]

Telford made his name in road building largely in the Highlands of Scotland, where his task was to revitalize and adapt for community purposes the military roads that had been built much earlier during the suppression of the Jacobite Rebellion of 1745.

Telford was among the first to bring sound engineering principles to bear on road construction. As a substitute for the haphazard methods in use at the time, he insisted on careful drainage of the foundation and adjacent terrain. His foundation, which came to be known as the Telford base, consisted of large uniformly sized stones which were overlaid with smaller irregular stones that gradually degraded under traffic to dust. This dust worked down into the larger stones to bind the surface. As opposed to other builders, Telford used only stones that were carefully graded and washed. This system, along with the slightly different scheme of McAdam's, was utilized in Virginia by Laommi Baldwin, Jr., when the Board of Public Works began to oversee the infant statewide network of roads.



This drawing of a Telford base appears in W. M. Gillespie's 1851 edition of *Manual of Road Making.*

Drainage, which was so important a part of Telford's scheme, was obtained by moderate cambering of the surface. The amount of cambering required careful attention to avoid canting the vehicles to an exaggerated angle. Overturned vehicles were commonplace when the camber became too much.

While Telford's name came in America to be associated with roads, his career included the design and construction of an enormous number of bridges. His initial effort was a three-arch span in stone over the Severn at Montford which still stands. Of his many bridges, perhaps two of his most interesting came respectively at the beginning and ending of his illustrious career.

In 1796, a few years after construction of his stone arch, he proposed and built a cast iron arch over the Severn just north of the bridge at Coalbrookdale, which Wilkinson and Darby had built in 1779**.** The Coalbrookdale structure was the first cast iron bridge in the world. Because of the difficulties surrounding the efforts of Tom Paine to build a similar bridge (see "Citizen Tom Paine: Bridge Engineer," in "Backsights," December 1973) it is to Telford that the honor goes for building the second cast iron bridge and for providing an impetus for the method's rapid development.

A second bridge, and certainly one of his crowning achievements, was the bridge over the Menai Strait between the Welsh Island of Anglesey and the mainland. Numerous solutions to this difficult crossing had been proposed. Telford, as indicated in a surprisingly calm statement recorded in his memoirs, said: "I recommended a bridge of wrought iron, upon the suspension principle." Telford's bridge, which spanned almost 600 feet, was the subject of his intense study and experiment for several years. His experiments included studies of ways to protect the wrought iron from rusting. As a result of his studies, he proposed methods for boiling the iron in linseed oil prior to painting. The experiments led Lewis Carroll to have the White Knight explain to Alice

I heard him then, for I had just
Completed my design
To keep the Menai Bridge from rust
By boiling it in wine.

No such exotic treatments were necessary. The bridge was begun in 1818 and completed in 1826, when Telford was 70. Its wrought iron eye-bars (or "chains") were replaced by steel in 1939 and it still carries traffic, far beyond anything that Telford could have imagined.

For his outstanding work, Telford was recognized by his peers by being elected the first president of the Institution of Civil Engineers in 1820. He also distinguished himself as a minor poet, since he occasionally wrote poetry under the pseudonym of Eskdale Tam. Another poet,

his friend Robert Southey, gave to Telford the labels “Pontifix Maximum” and “The Colossus of Roads.” The epithets were well deserved, for the impact of his genius extended far and wide, even to the then developing road system of Virginia, where Telford bases in numerous unknown locations still exist.

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Macadam Roads: A Product of the American Revolution

Howard H. Newlon, Jr.

["Backsights" No. 16: originally published in the *Bulletin*, July 1974]

"McAdam" and "macadamizing" have been important words in the road builder's vocabulary for over a century and a half. Macadamizing is a process for surfacing roads that was initially developed by John Loudon McAdam, a Scotsman born in 1756, a year before his road-building countryman, Thomas Telford (who was the subject of "Thomas Telford—The Colossus of Roads" in last month's "Backsights").

[*Image in original:* Portrait of McAdam. *Caption:* John Loudon McAdam.]

McAdam was born in Ayrshire, the son of a country gentleman. His father died when he was eighteen and he came to America as an articled clerk in his uncle's office in New York. During the War of Independence he made a sizable fortune as an agent for the sale of prizes captured from the American rebels. When the rebels became the legal government of the new United States, McAdam found himself penniless and returned to Scotland in 1783.

He was appointed a commissioner for highways, normally a rather drab and thankless task. But here that spark of curiosity and initiative that separates greatness from mediocrity asserted itself, and he set about to learn and understand everything that he could about the system (if it could be called that) of road building.

In 1816 he moved south to Bristol as inspector of highways, and there began the work that established his worldwide reputation. Like Telford, McAdam paid meticulous attention to the correct grading and selection of materials and to good drainage. The primary difference between the systems of McAdam and Telford was that McAdam dispensed with the elaborate foundations that were part of the Telford system. McAdam's was primarily a surfacing system which was widely applied to the repair of roads; however, it was also applied to new construction and demonstrated that a well-drained subsoil was capable of carrying the loads imposed upon it. The main advantage was its low initial cost as compared with the more extensive Telford system.

In 1816 McAdam published his book entitled *Remarks on the Present System of Road-Making*. This book was expanded in 1819, and with it his fame spread beyond his own country.

McAdam is said to have deduced the leading principles of his system from his observation of the passage of a heavy vehicle over a newly formed gravel road. He noted that the wheels sank in to a considerable depth until the pebbles were broken into angular fragments, which finally formed a compact mass. He concluded that the task of breaking the stones should not be imposed on the carriages, but rather should be performed in advance by manual labor.

McAdam and his disciples laid down rules for the quality of stone that were generally accepted. A major contention among practitioners was the size and grading to which the stone was to be broken. McAdam advocated a uniform size. He initially specified that the stone had to pass through a ring with an opening of 2½ inches. Other engineers promoted different dimensions, and French engineers recommended the use of all sizes from 1½ inches to dust.

Ultimately McAdam revised his recommendations to use stones on a weight rather than a size basis. He directed his overseers to carry a pair of scales and a 6-ounce weight as a standard against which to judge the acceptable size of the stones.

From W. M. Gillespie's *Manual of Road Making,* published in 1851, an idea of the procedure can be gained. Gillespie writes:

> The laborer sits before the pile, and breaks the stones on it, or on a large concave stone as an anvil, on which the stones to be broken are placed, resting only on their ends, so that, being struck sharply in their middle, they break into angular fragments. Children with smaller hammers can do the lighter work, so that a whole family may be employed. The workmen should not be paid by the day, but at an equitable price per cubic yard. A medium laborer can break in a day from 1½ to 2 yards of gneiss; but only ½ to ¾ yard of hard boulders.

McAdam generally specified a uniform thickness of 7 to 10 inches for the finished rock, consisting of layers tightly packed by rolling and tamping.

It is sometimes difficult to separate roads built exactly to McAdam's standards from those constructed from similar procedures but referred to under the general term "macadamizing." For example, in 1817, Laommi Baldwin, Jr., principal engineer for Virginia's Board of Public Works, laid down elaborate specifications for stone-surfaced roads in Virginia consisting of three layers. The bottommost layer, from a foot to 18 inches thick, was to contain large stones. The middle layer containing stones "broken to the size of about four inches, well hammered and rammed in" was to be about 12 inches thick. The third and last layer was to be "coarse gravel or stone broken to the size of hickory nuts, thrown on evenly or rammed or rolled with a heavy iron roller." This last layer was to vary from 10 inches in the middle to 8 at the sides. This type of construction, which was used on several of the roads under the jurisdiction of the Board of Public Works, was closer to Telford's than to McAdam's system.

The first McAdam road surface in America was laid upon the "Boonsborough Turnpike Road" between Hagerstown and Boonsboro, Maryland. This surfacing of 10 miles of road was completed in 1823 and was followed in 1825 by the surfacing of a 73-mile section on the National (or Cumberland) Road between Wheeling (then Virginia) and Zanesville, Ohio.

The first McAdam road in what is now Virginia appears to have been on the road built by the Fauquier and Alexandria Turnpike Company in 1824. The charter of the company required the use of the McAdam plan to pave a roadway 20 feet wide. The width was later reduced. Claude Crozet, who was then serving as principal engineer for the Board of Public Works, was not exactly pleased with the work and wrote to the Board:

> . . . I was informed by the President of the company, that this section had been contracted for at $28,000; in consideration whereof, it was to be overspread with a bed of broken stones, 12

> inches thick, and 18 feet wide . . . the stones to be broken to 6 ounces weight. The macadamized portion of the road lay between Warrenton (Fauquier C. H.) and Buckland, a distance of 8½ miles. They exceed, however, much these dimensions: Their present size will certainly prevent their crushing sufficiently to become soon cemented: So that for a long time, they will only form a bed of rolling stones extremely fatiguing for draught horses: They should be broken smaller, or else the largest should be raked out of the road.

In 1827 the report from the Fauquier and Alexandria Company indicated that the road surface of the rest of their road was being taken up and relaid to "make it correspond with, and equal to the new road from Warrenton to Buckland, and is acknowledged to be the best road in Virginia." Crozet was not convinced of the Company's self-evaluation and continued to emphasize that the stones were too large.

The use of stones that were too coarse also turned out to a problem for the Lynchburg and Salem Company the same year (1827). Crozet continued to criticize the fact that the companies were allowing the contractors to get by with not breaking the stones fine enough. His inspections also disclosed numerous instances where the capping had been made "thinner in many places than required by specifications." Crozet was actually not as concerned with the surfacing materials as he was about the geometrics and drainage, but he obviously was very insistent that McAdam's requirement that the stones be broken to a small size be followed.

The term macadam continued to be applied somewhat erroneously to a variety of broken stone roads well into the twentieth century. The system of small uniform stones that was advocated by McAdam was gradually replaced by other paving systems. But the name macadam came in many areas to be synonymous with good all-weather stone surfaces.

Though McAdam took up his road-building activities as a direct result of the American's victory in the Revolution, it is probable that his surfacing system would have been developed in any case because of its simplicity and the overwhelming need for surfaced roads. The revolution in road making would have been delayed, however, and would not have carried the name of McAdam.

Early Road Maintenance in Virginia

Howard H. Newlon, Jr.

["Backsights" No. 17: originally published in the *Bulletin*, August 1974]

In the early days of road building in the Commonwealth, the opening of a new road was usually met with great enthusiasm and excitement by both the potential users of the road and those responsible for administering it. But once the road was constructed, the problem of keeping it "in good and perfect order and repair," a term often used in the enabling legislation, proved very difficult and put a severe strain upon the resources of the owner, whether it was the state or a private company.

From the outset of organized road administration, the corvée or statute labor system was the basis of road maintenance. This system compelled those citizens who lived on or near a road to work upon it a certain number of days in the year. One might, if one wished, make a money payment in lieu of performing work in person, and, as a rule, all those who could afford to did so.

The road law of 1785 defined laboring tithables as "all male persons over the age of sixteen, except the master or owner of two or more labouring tithables, the owner of iron works, millers, ferry keepers, and all such as the courts think proper to exempt through age or infirmity." Owners of coal mines were exempted in 1802. In 1827 the list of exemptions was expanded to include persons over 60, town dwellers, officers of jails, asylums, and other public institutions, turnpike and canal employees, officers of any literary institution, and ministers. The fine for failure to appear was 75 cents per day. The charter of the Little River Turnpike Company, approved in January 1802, read in part: ". . . until the said road shall be completed, the county courts of Loudoun and Fairfax, shall be, and they are hereby empowered and required, to appoint overseers, and to allot the male labouring tithables residing within three miles of the road as at present established, to work thereon, not exceeding six days in any one year."

Before 1827 residents of towns were generally exempted by specific statutory provision in the town charter, or amendments thereto. Residents of unincorporated villages, however, were not exempted. Citizens of every village, therefore, were inclined to look forward to their village's attaining the status of town, and acquiring with it exemption of the residents from work on the county roads.

Obviously this distinction between the citizens of towns and others, exempting the one group from heavy manual labor, was the potential cause of considerable friction. Many instances of this conflict can be found in various petitions to the legislature.

One interesting petition came from the stockholders of the Martinsburg and Potomac Turnpike Company, who, in pleading for relief for themselves, asked consideration of ". . . how far the passage of a general law upon the subject might not be an inducement to a large portion of the citizens of the state, to become stockholders in joint stock companies, for the purpose of

building McAdamized road, if thereby they would be released from the obligation of working upon the common high ways."

Statute labor was not only distasteful to those who had to do it, but also to the leading technologists of the time, such as W. M. Gillespie, who, writing in 1854, condemned the practice, saying: "The 'Road Tax' system, of personal service and commutation, though nearly universal among us, is unsound in principle, unjust in its operation, wasteful in its practice, and unsatisfactory in its results."

It appears that most statute laborers merely put in time, doing as little work as possible. The overseer, being of the same social group as the workers under his supervision, ordinarily condoned such negligence. Most of the time appears to have been spent in socializing and swapping stories.

The turnpike companies that flourished in the nineteenth century generally were not eligible for statute labor and, considering the contemporary descriptions and controversy surrounding the practice, it was just as well for them. Most turnpikes were roads covered at least in part by an artificial surface of stone. Their maintenance and repair required a somewhat higher degree of skill than had been required under the provisions of the road law of 1785 that had said: "Every surveyor of a road shall cause the same to be constantly kept cleared and smooth, and thirty feet at least; unless the court shall by order entered of record authorize a lesser width."

Almost all of the turnpike companies organized their maintenance programs around some form of the contract system. The Staunton and James River Turnpike Company initially hired a full-time superintendent and two hands, but found them unproductive. It next contracted maintenance of the entire 44-mile road "to undertakers, for one year the price of $2,500 per annum." After two years of this system, the company abandoned it since "there has been so much difficulty in procuring faithful men as undertakers." The company then decided to hire "a general agent at a salary of $500," who was also to act "as treasurer and secretary, and attends to and superintends all the business of the company. He is authorized to hire from fifteen to twenty-five hands to carry into effect the above order of the stockholders, and also to keep the road in repair."

Some, like the Staunton and James River Company, always hired a single agent to maintain the entire road. Others hired a number of contractors, each responsible for only a short section. In some cases, when companies were forced to admit that the roads were failures as business projects, they let the maintenance contractor also collect the tolls, keeping all the money that he received.

The turnpike companies were under more than just altruistic pressures to keep the road in good repair. Most enabling acts contained requirements such as those in the act authorizing the Ashby's Gap Turnpike in 1810. It said: "If the said company shall neglect to keep the said road in repair for the space of five days, and information thereof shall be given to any justice of the peace in the neighborhood. he shall issue a warrant to a constable, commanding him to summon three freeholders to meet at a certain time and at the place complained of, both to be mentioned

in the warrant, previous reasonable notice having been given to the person entrusted with the repair thereof, and, if, on enquiry, by the said freeholders, in presence of a justice of the peace, the said road shall be found to be out of order, according to the true meaning of this act the tolls shall cease to be demanded at the nearest gate, until such defective part of the said road shall be put in proper repair; and moreover the person entrusted by the said company with the repairs thereof, shall be subject to a fine of ten dollars."

This "throwing open of the road" weighed heavily upon those responsible for repairs, as reflected in a report from the Ashby's Gap Company 33 years after its origin. Speaking of damage from the "great rains of September, which has *[sic]* done great damage to the road and bridges," the report said: "The road has been repaired in particular places, and is still undergoing repairs as fast as they can be made, to prevent the gates from being thrown open, which was the case for a few days before we could get the worst places in the road repaired and the bridges overlaid with wood like unto a causeway. The stonework cannot be repaired until next summer, when some of the bridges will be nearly rebuilt, particularly the arches." In the case of the Ashby's Gap Company, the repair of the bridges was a major problem since the turnpike's 20-mile length included 14 stone bridges.

Because the income from the turnpikes depended upon the continuing receipt of tolls and the maintenance of a certain level of service, provisions were included in the general road laws and specific acts restricting wheel loads and specifying progressively lower allowable loads as the fall and winter months approached. The companies were authorized "to erect scales at each toll gate on the said road; and on reasonable suspicion, that any waggon, cart or other carriage, contains therein a larger weight than by the Owner or driver represented . . . may prevent any such carriage . . . until the exact weight be ascertained by the scales."

As many of the turnpike companies began to suffer the simultaneous effects of the nation's economic depression, competition of the railroad, and the approaching Civil War, more and more echoed the lament of the Ashby's Gap Company in 1859, which reported: "No appropriation was made for repairs: though some small repairs have been done by special contract, and some of the bridges rebuilt and repaired, having been injured by the freshet. The road is, therefore, not in good condition . . ."

If the toll roads which were required by law to be maintained at the penalty of loss of revenue were bad, the public roads which depended upon the inefficient statute labor system were worse. Joseph Martin, a gazetteer, gave this description of the roads in Goochland County about 1830: "The only good road in the county, and one of the best between the Blue Ridge and Tidewater, is the main stage road leading by the court house, from Richmond to Charlottesville. A laudable pride is felt, to keep the highway in good repair. There are sections of other roads, preserved in good order; but generally speaking the road laws are executed with very little attention to public convenience. The Three Chopped road is almost as much famed for its often impassable condition as the well known bog of the Choppawamsic."

Obviously, the laudable goal of roads in "good and perfect order and repair" was seldom realized.

Nineteenth-Century Superhighways

Howard H. Newlon, Jr.

["Backsights" No. 18: originally published in the *Bulletin*, September 1974]

The term "superhighway" is a product of the post-World War II development of roads capable of moving high volume and high speed traffic over comparatively long distances. Like the older term "turnpike," it is used in a general way to refer to a variety of specific road types that may differ in the details of their design or construction but which share the common characteristic of traversing comparatively long distances. If the term superhighway had been in vogue at the time, however, it could well have been applied to at least four of the turnpikes constructed during the nineteenth century.

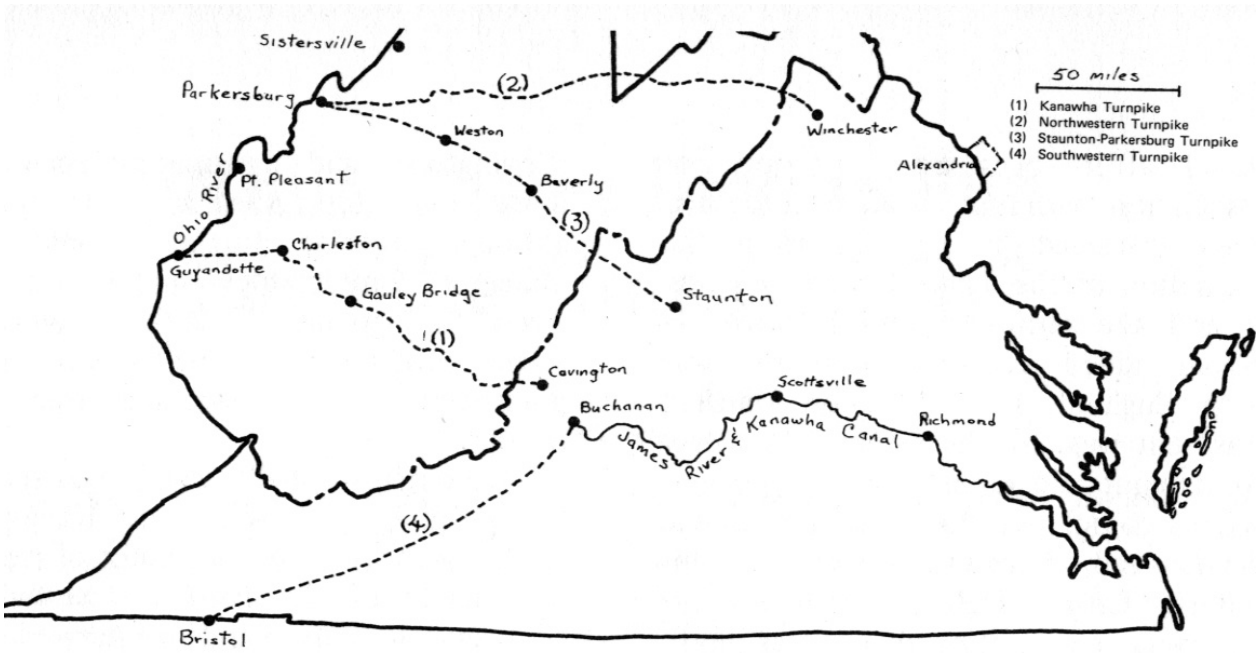
The appellation would not have been warranted from the fact that these roads were better from the standpoint of technology or because they were successful, but rather because of their sheer length (each was approximately 200 miles long) and because of their ambitious purpose. These were Virginia's bid for the western trade in response to and in the face of considerably stiffer competition from states such as Maryland, New York, and Pennsylvania.

Previous "Backsights" have described the general principles and organizational structure that guided road development during the period 1816-1860, which has been designated by some as the Turnpike Era. While important turnpikes were built prior to 1816—notably, the Little River, Fauquier and Alexandria, Ashby's Gap and others—these were largely local efforts, and it was only after the formulation of a sound financial and technological base provided by the formation of the Board of Public Works that the major emphasis on turnpike development occurred.

The political and economic pressures to develop and maintain communications with the westward settlements were the dominant factors in Virginia's nineteenth century policy for internal improvements and a very large portion of the state's effort was directed toward the James River and Kanawha Canal. By 1820 the James River Company had succeeded in building a canal around the falls at Richmond and improving the river as far west as Buchanan. The legislature felt that the company was dragging its feet, and in 1820 it reorganized the company under legislative control. In 1823 it went further and transferred the administrative direction of the company to the Board of Public Works. It was under this administrative structure that the Kanawha Turnpike, the first superhighway, was constructed by the James River Company. The remaining three roads—the Northwestern, Staunton and Parkersburg, and Southwestern—were constructed under direct state supervision, a rather unusual fact in itself. This state involvement was necessary because private interests were unwilling to undertake the large efforts since they could not gain the type of special attention enjoyed by the James River Company.

The approximate routes of the four roads are shown on the accompanying map, which also locates the route of the James River and Kanawha Canal improvements and certain key towns associated with the roads. From the map it can be seen that the four roads were the

forerunners of current U.S. Routes 60, 50, 250 and 11. Other important characteristics were as shown in the accompanying tabulation.



Nineteenth Century "Superhighways:" Kanawha Turnpike (1); Northwestern Turnpike (2); Staunton and Parkersburg (3); Southwestern Turnpike (4).

Charter Date	Name of Company	Route	Length	State Subscription
1820	James River Company	Covington–Gauley Bridge		
1825	James River Company	Gauley Bridge–Charleston		
1829	James River Company	Charleston–Big Sandy (Guyandotte)	208 (total for all three sections)	$249,393 (total cost including private funds)
1831	Northwestern	Winchester–Parkersburg	237	$425,280
1838	Staunton & Parkersburg	Staunton–Monterey–Beverley–Buckhannon–Weston–Parkersburg	234	$368,278
1846	Southwestern	Buchanan–Salem–Christiansburg–Newbern–Wytheville–Smyth Court House– Seven Mile Ford	175	$562,100

The general thrust of Virginia's attempt to connect the eastern areas with the Trans-Allegheny region and the major dependence of this effort upon the James River and Kanawha Canal are evident from the relationships shown on the map. Three of the roads were aimed at Richmond while the remaining one focused upon Alexandria. The Kanawha and Southwestern Turnpikes were directed from the terminus of the canal at Buchanan. The Staunton and Parkersburg Turnpike connected with the 43-mile Staunton and James River Turnpike, which

had been started at the canal at Scottsville in 1824 and completed with a state subscription of $125,000.

The connection of the Northwestern Turnpike with Alexandria was via several of Virginia's earliest turnpikes; namely, Little River, Ashby's Gap, and Snicker's Gap, all chartered before 1810.

The Kanawha Turnpike was the initial effort because of its intimate association with the canal. While it had been discussed in concept from the formation of the James River Company, it and the entire westward thrust received added attention after the war with England. In 1814 John Marshall was sent west by the General Assembly to examine and report upon the possibility of completing the connection of the James and Kanawha Rivers. In his report, Marshall dealt at length with the Kanawha road, noting that it was physically possible to build. With regard to economic feasibility, he said:

> Should the navigation of James River be carried up to the mouth of Dunlop's creek (Covington), and a turnpike road be made over the Alleghany mountain, although nothing further should be done, a considerable impulse will be given to agriculture, and a valuable effect produced on the wealth and population of a considerable tract of country.

Although Marshall's report was specifically directed toward the Kanawha road, it reflected the viewpoint of many proponents of the need for westward connections. With it and the start of the Kanawha Turnpike, dawned the era of nineteenth century superhighways.

The Kanawha Turnpike

Howard H. Newlon, Jr.

["Backsights" No. 19: originally published in the *Bulletin*, October 1974]

The September 1974 "Backsights" advanced the thesis that four of the nineteenth century turnpikes—the Kanawha, Northwestern, Staunton and Parkersburg, and Southwestern—would have deserved the appellation "superhighway" had the term been in vogue during the period of their construction. This term would have been deserved primarily because of the length (each was approximately 200 miles long) and because of their ambitious purpose, which was to connect the eastern markets and centers of commerce with the rapidly expanding frontier.

The Kanawha Turnpike began at Covington and was constructed to the mouth of Big Sandy River (near Guyandotte), a length of 208 miles. Construction on the initial segment between Covington and Gauley Bridge began in 1820, although the general route had been established earlier by commissioners acting under an act passed by the legislature in January 1808. The commissioners reported that the "Road through the Loop" was preferable to the Peters Creek road. John Marshall's favorable report after being sent west by the General Assembly to examine and report upon the possibility of completing the connection of the James and Kanawha Rivers, and the discussion that followed, finally led the General Assembly to produce legislation for the turnpike's construction.

The State's principal engineer, Thomas Moore, who had succeeded Laommi Baldwin, Jr., in the position in 1818, questioned the feasibility of the effort as was quoted in the February 9, 1819, edition of the Richmond paper *Commercial Compiler* as follows:

> When we consider that the transportation of a ton of produce or merchandize on the best road of that grade, will cost about one third more per 100 miles, than on the whole of the remainder of the route, 358 miles, or nearly five to one, it becomes a consideration, whether the route under these circumstances, will be sure to command so much of the western trade as to render it prudent.

Moore was an advocate of either inclined planes or "well constructed cast-iron railways," citing successful English examples. The legislature was not impressed with such innovations and directed him to survey the route, which he did, and after which, in 1820, the legislature directed the James River Company to build the turnpike "from the mouth of Dunlap's creek to the great falls of the Great Kanawha river." This act, plus the $100,000 and the promise of more money, if needed, made it possible to get the effort under way at last. The original intent was to end the road at Gauley Bridge, where traffic could be transshipped to the Kanawha River. When the turnpike reached Gauley Bridge in 1825, the legislature decided to extend it to Charleston. Charleston was reached in 1827. In response to local requests, the General Assembly in January 1829 authorized the company to borrow $50,000 on the credit of the state to extend the Kanawha Turnpike to the mouth of the Big Sandy River. Claude Crozet was directed to make the survey and the letting of contracts and superintendence of construction was assigned to Peter Scales.

The exact date of arrival of the turnpike at Big Sandy is not clear, but the road was essentially completed when the legislature in March 1832 reorganized the entire canal and turnpike enterprise as the James River and Kanawha Company.

The final segment of the Kanawha Turnpike was a matter of considerable controversy. When Crozet was directed to survey the final segment, he discovered a serious mistake in the original location which had resulted in the construction of the Gauley Bridge over the wrong river. The crossing of the Gauley put the turnpike on the north side of the Kanawha, while bridging the New River instead would have located it along the south side. If the road had terminated at Charleston as originally planned, this would have been fine, but extension to the mouth of the Big Sandy meant that the Kanawha would have to be crossed again at or below Charleston. Crozet wrote: "This is a very striking example of the disadvantageous consequence of partial and successive improvements executed without previous inquiry into their future ramifications, by which the beginning may ultimately harmonize with the end."

In 1826 Crozet had closely examined 94 miles of the Kanawha Turnpike from Covington to Gauley Bridge. For a road through such rugged country, he was well pleased with the work. He wrote: "Its execution and convenience, are praised by all those who duly appreciate the difficulties it had to contend with: it is universally thought to be equal, if not superior to any road of the kind that has been made in this country over ground as difficult as that it traverses." For those familiar with Crozet's description of other projects, these words are indeed extravagant praise.

He was also impressed with the quality of the bridges, especially with one over the Greenbrier River, which he said was "one of the most splendid wooden bridges ever built." It consisted of two spans of 211 feet each, with stone abutments and a stone pier. He praised its builder, saying "It does the highest credit to the builder, Mr. James Moore, who, it is to be hoped, will meet with such patronage as will keep him in the State. I know of only three instances where the span of this bridge has been exceeded; it is even 16 feet greater than that of the Schuylkill bridge." The Gauley River bridge, also built by Moore, had three arches of 160 feet each and caused Crozet to remark "This handsome monument of human skill and enterprise, at the confluence of two streams, and in the midst of a remarkably wild scenery, looks exceedingly beautiful." Crozet was pleased that these two bridges had been built for $18,000 each since Baldwin had estimated the cost of each structure to be $20,000.

None of the original bridges on the Kanawha appear to have survived but several of the early replacements are still extant. Notable among these is Humpback Bridge. The current structure was, according to Richard S. Allen, built in 1835 by a Mr. Venable from Lewisburg. *[NOTE: Subsequent research indicated that the present Humpback bridge was built in 1857, replacing the 1835 bridge.]* It is the only survivor of three such "humped" structures, a design type apparently unduplicated anywhere in America. The extant structure appears to be at least the third at the site. In Crozet's report of the inspection made in 1825, he writes:

> In sight of Covington, the road ascends a considerable hill, to avoid some difficulties in the valley of Dunlap's Creek; it soon descends again into this valley, and crosses the creek three times on bridges of considerable length. One of these bridges gave way during last summer, and had to be re-built; another shewed symptoms of a similar fall, but was propped up in time. This

> accident was owing to the too considerable bearing given to the longitudinal beams stretched across the stream, which were each composed of two very long beams touching each other at their ends, without any scarfing, and wholly united by a framing above; the whole being only composed of narrow split pieces, without any horizontal crossbraces, was not capable of resisting any lateral pressure, (a circumstance too often neglected in bridges); and the whole bulged laterally. The new bridge has been better framed, and the string pieces made of stronger dimensions, and overlapped at their junction in the middle of the bridge. Still, the span is, I think, too great for a flat bridge.

In this last sentence may be the germ of the idea which led to the unique configuration.

[*Image in original:* Humpback bridge. *Caption:* Humpback bridge.]

People in Ohio were contacted to learn their reaction to the extension of the Kanawha Turnpike to the Ohio River. One response from Samuel Vinton, member of Congress from Ohio, was that Virginia was making a mistake in going to Big Sandy rather than to Point Pleasant (approximately opposite Gallipolis). He thought the Big Sandy connection to be logical for Virginia and Kentucky but inconvenient for Ohioans.

Actually the legislature had already directed a survey of the route from Charleston to Point Pleasant and the survey was completed in 1828. However, in response to Vinton's view expressed in 1833, the route was resurveyed. In 1835 a private firm, The Charleston and Point Pleasant Turnpike Company, was chartered, and it completed the road in 1839.

The year 1837 was the beginning of a long economic depression and was complicated by a severe flood on May 14 and 15 which was so violent that "the road was literally swept away for considerable distances upon many parts of the line. Eleven bridges were lost."

The period between 1840 and 1850 was marked by conflicting views as to the relative merits of extending the canal through the Alleghenies, constructing a railway, or making greater efforts on the Turnpike. A temporary victory by the proponents of the canal construction forestalled the railroad efforts, and gave the Kanawha Turnpike a new lease on life. It reached the height of its popularity about 1850, but by 1858 the Covington and Ohio Railroad was under construction, the death knell for canals had sounded, and the demise of the Kanawha Turnpike was inevitable. The death blow, like that for most turnpikes, was the Civil War. The Confederacy was never able to establish control of the Kanawha Turnpike. In 1862 the legislature of the new state of West Virginia assumed control of the Kanawha River improvements. In 1866 the interest of the state in all turn pikes and bridges was transferred to the counties in which they lay.

The Kanawha Turnpike could not be judged a great success. It was not kept up to the standards of a first class road, and it did not really bind east and west by strong commercial ties. It did provide a route for westward migration, and perhaps more than anything else it demonstrated that the Allegheny Mountains were even more of a barrier than had been anticipated. Despite its faults, it did serve as the first and only link between the James and Kanawha Rivers until the Chesapeake and Ohio Railroad was built after the war.

Because of its character, its length, and the ambition of its purpose, it can rightly be called a nineteenth-century superhighway.

The Northwestern Turnpike

Howard H. Newlon, Jr.

["Backsights" No. 20: originally published in the *Bulletin*, November 1974]

The four nineteenth-century "Superhighways" identified in the September 1974 "Backsights" were ambitious attempts to secure for Virginia the lucrative trade of the territory northwest of the Ohio River and to maintain communications with its rapidly expanding settlements. As described in the October 1974 "Backsights," "The Kanawha Road," the first of these superhighways, the Kanawha Turnpike, was unique among the four in that it was built by the privately owned James River Company. Private funding for the road was possible largely because of its association with the James River and Kanawha Canal, the major component in the state's transportation network.

The second of these roads to be undertaken was the Northwestern Turnpike, which like the subsequent two projects, the Staunton and Parkersburg and the Southwestern Turnpikes, did not attract sufficient private capital and was constructed by contractors directly funded and supervised by the state. Unlike the other three roads, the Northwestern Turnpike did not connect on the east with the James River and thence Richmond, but was directed westward from Winchester to Parkersburg. At Winchester, a connection was made with Alexandria via several of Virginia's earliest turnpikes—the Little River, Ashby's Gap, and Snicker's Gap—all chartered before 1810. The route essentially coincided with that currently followed by U.S. Route 50. In fact several of the stone roadway markers are still visible along the present route.

[*Image in original*: Image of Crozet and map of the Northwestern Turnpike (from Rose, *Historic American Highways*). *Caption:* (On the map) 1827 The Northwestern Turnpike.]

By 1824 the Kanawha Turnpike was approaching Gauley Bridge when a turnpike convention met at Clarksburg. The delegates noted that the region "with the exception of the facilities furnished by the Ohio River, may be said to be totally destitute of the means of transporting its productions to market." They reasoned that if the state could invest $100,000 in the Kanawha Turnpike, there could be little objection to subscribing $106,000 to a $265,000 turnpike between Winchester and the Ohio River. Three years later, in February 1827, the Legislature authorized the incorporation of the "North Western Road Company," but with a capitalization of only $75,000. The promoters were unable to raise their portion of even this small amount and the company failed. During this period, however, Crozet surveyed the ground and indicated that the road could be built. Assuming that it would be patterned after the Kanawha Turnpike, he estimated that it would cost $125,000.

The eastern portion of the route was to follow approximately the "State road," which had been authorized by the General Assembly before 1786, from Winchester through Romney to Morgantown. The westward branch of the road ran from Romney through Clarksburg to Parkersburg on the Ohio River.

Following the failure of the initial company, the petitioners continued to press the legislature for the road, using a variety of arguments. They stressed the commercial advantages for the eastern counties and the importance of retaining potential emigrants, and, finally, they pointed out that the northwestern citizens had contributed heavily to the Fund for Internal Improvement, "yet they have hitherto received none of its benefits." This complaint was to be a constantly recurring one until the area was incorporated into the state of West Virginia.

On March 19, 1831, the General Assembly finally enacted a law providing for the road and meeting most of the petitioners' requests. One unusual feature was that a group of high state officials, composed of the governor, treasurer, attorney-general, and second auditor, were established by law as "The President and Directors of the North-Western Turnpike Road."

The act further directed Crozet, as principal engineer of the Board of Public Works, to locate the line. From his report it is apparent that his primary concerns were the technical ones of length, grade, and ground. Even though the route would have been shorter if it had ended at Sistersville, Crozet recognized that Parkersburg was the likely terminus, based upon political considerations. The proponents of Parkersburg, however, spent an uneasy fifteen months between Crozet's survey and the General Assembly's final action in their favor in 1833. The most direct line took the route through a corner of Maryland. Crozet saw this as of little concern, and in fact it was not. In March of 1834 the Virginia and Maryland legislatures simultaneously chartered a company subsidiary to the Northwestern Turnpike, entitled "The North Western Turnpike Company of Alleghany in the State of Maryland." It issued stock, all of which was taken by the Northwestern Turnpike Board.

The Northwestern Turnpike was the state's initial venture into the direct contracting and supervision of a large road project. The contractors, usually called "undertakers," were local citizens, untrained as engineers, with varying degrees of amateurism as road builders. Likewise, the governor and other officials who formed the Northwestern Turnpike Board had no experience in this type of endeavor.

Relying heavily upon Crozet and his assistant at the Board of Public Works, Charles B. Shaw, the Turnpike Board left little to conjecture in writing the very detailed contracts with the undertakers. When the project was completed, there was general agreement that it had been worthwhile and that the state's direct involvement in such efforts should be continued. Because it was the initial such effort of the state, however, the enterprise was plagued by a multitude of delays and difficulties, some petty and some otherwise. Those who currently administer the system of which the Northwestern Turnpike was the forerunner will probably feel considerable sympathy for their forebears because the various documents reflect many of the more recent controversies concerning the most efficient system for contract administration. These include the feasibility of using private contractors as opposed to state forces, delays within the state bureaucracy, the need for decentralization, and interaction among contractors on overlapping sections.

During the spring and early summer of 1834, bids were received on eight sections at the western end of the project. Four firms were successful. H. Crolly took the second, fifth and seventh sections; Farr and Kidwell the fourth and eighth; J. Maloney, the sixth; and G. W. Trout,

the ninth and tenth. As would be expected, the difficulties associated with a variety of short contracts with different contractors interspersed along the route soon became evident. Lack of cooperation among the contractors and the Turnpike Board, as well as difficulties in resolving conflicts, caused Charles Shaw in 1837 to write:

> . . . it may be thought worth while to investigate the causes of the delay experienced in the construction. The principal of these I conceive to be a want of unity of action in the several agents employed in the work. The Board of Public Works being charged by the general assembly with the task of constructing a road, the principal engineer makes the location and specifies the mode of construction. . . a selection is made from among the list of proposals submitted to the board, and contracts are directed to be entered into by the superintendents. . . and a long correspondence ensues, between parties 300 miles apart, upon the appearance of any difficulty or doubt in the terms of the contract or the engineer's specifications; the contractors possibly first writing or making complaint to the superintendent, he addresses the board; if the difficulty appertain to a construction, the board refers the matter, by resolution, to the engineer, who may be in a distant part of the state; he makes the necessary explanation to the superintendent, and he to the contractor. Thus, weeks, if not months, are sometimes occupied in the adjustment of matters which, upon a better system, might be settled at once. The power of making contracts, and superintending the construction, should be reposed in an officer of the general assembly or the Board of Public Works, who should be unfettered by other limits than specifications and estimates of the engineer, and his own discretion.

Obviously the cry for decentralization is nothing new!

There were some instances of fraud, but the major problems were caused by inexperience on the part of both the undertakers and the overseers. Despite his aggravation, Shaw was forced to admit that some contractors had "executed their contracts with sufficient diligence and intelligence to insure themselves a profit." Because these were the exception rather than the rule, Shaw concluded that the "only remedy" was to invest the superintendent with "despotic power" and "vacate all contracts upon which the work shall not progress with reasonable dispatch and in good faith, and proceed against the sureties."

Apparently the Board did experiment with more stringent policies but without much success. Crozet then persuaded the Board to experiment with letting the superintendent play the role of contractor for the final few miles, hiring his own "state force" and directing the work himself. Such an experimental comparison of contract vs. force account construction has been repeated many times with varying conclusions. Crozet and the Board were pleased with the results. He said that the system

> . . . has proved much preferable to that by contracts. The 25 miles made by our superintendent, Mr. Josiah D. Wilson, under the unfavorable circumstances of high prices for labour and provisions . . . will cost about $8000 less than the amount of the lowest responsible bids; and the road is certainly better made . . . The saving . . . is consequently about $320 per mile." This was about one-half of the lowest bids for the adjacent sections.

Originally there was no provision for a stone capping of the road but some "toilsome sandy ascents" were capped with broken slate in 1838. This lasted until about 1848 when macadamizing of the approaches to Parkersburg, West Union, Clarksburg and Pruntytown began.

Based upon records in the Company's Minute Book, bridges proved a major headache. Louis Wernwag, a bridge builder of long experience, apparently defrauded the Board in building the bridge over the South Branch of the Potomac. Zedekiah Kidwell built bridges over the Tygart and Cheat which had to be elevated several feet after construction, and half the roof of Tygart's Valley Bridge fell in from the weight of snow. Other bridges were built of green lumber, which caused shrinkage and loosening, and one fell from the weight of cattle crossing it.

Thus the state's first venture into direct involvement in contract administration and construction of an interstate highway was not without problems. The fact that the route laid out by Crozet serves today's much more demanding traffic needs is a tribute to his skill. Despite its troubles, Crozet wrote:

> Even before its completion and during the present trying times, the price of land had advanced along it from four to ten times its original value. The population and clearings are daily increasing, and a great number of enterprising Pennsylvanians have removed to that district of the state. Such of course will be the consequence of other roads through the formidable central range of mountains of Virginia, a country at present almost a wilderness and where comforts are unknown.

Certainly, the Northwestern Turnpike foreshadowed an increased effort toward direct state involvement in such major roadway projects that continued with the Staunton and Parkersburg, and Southwestern.

The Staunton and Parkersburg Turnpike

Howard H. Newlon, Jr.

["Backsights" No. 21: originally published in the *Bulletin*, January/February 1975]

In March 1838, the legislature authorized construction of the Staunton and Parkersburg Turnpike, third of Virginia's four nineteenth-century superhighways. Like the Northwestern Turnpike, which was the second of these roads to be built, the Staunton and Parkersburg was financed by state funding and its western objective was Parkersburg on the Ohio River at its junction with the Little Kanawha. Its eastern terminus was Staunton, which provided, via the Staunton and James River Turnpike, an eastward connection with the James River and Kanawha Canal at Scottsville. For much of its 235-mile route, the Staunton and Parkersburg followed terrain presently traversed by U.S. Route 250.

[*Image in original:* 19th century view of Parkersburg. *Caption:* View of Parkersburg, from Frank Leslie's *Pictorial History of the War of 1861*. Photo by the Virginia State Library.]

The importance of the connection between the James and Ohio Rivers had been recognized by the legislature for more than 20 years. In 1817, the year after the creation of the Board of Public Works, the North Western Turnpike Company had been chartered as a purely private enterprise to connect Staunton and Sistersville (about 40 miles north of Parkersburg on the Ohio). Nothing came of this project, but after surveying the route again in 1823 Crozet was also convinced that the road should be built. The legislature agreed and in 1824 directed that "a public road shall be opened from Staunton, to the mouth of the Little Kanawha, on the ground designated by the public engineer." This effort was doomed to failure for two reasons. First, financing was based upon letting the counties through which it was to be located retain tax revenue they would otherwise contribute to the state treasury. Secondly, the actual work of roadbuilding was left to the county courts. Only Randolph County made any significant progress.

Again in 1827 Crozet emphasized the importance of the road, this time skillfully pointing out its potential benefit to the state's favorite project, the James River Canal. Crozet commented:

> . . . This road, by opening a direct communication with the centre of the State of Ohio, and the western counties of Virginia, would add so much to the prosperity of Staunton, as to have a material influence on the revenue of the Staunton and James River turnpike, opened last year; and, consequently, any improvement calculated to benefit the trade of Staunton with the west, will also benefit the James River trade, and deserves the attention and patronage of the Legislature.

Although interest in the project was increasing, in 1831 the state began its heavy financial commitment to the Northwestern Turnpike. Several years later the apparent success of the Northwestern and other routes had brought a significant shift of policy toward heavy borrowing for internal improvements. A major beneficiary of this shift was the long-pending plan for the

connection between Staunton and Parkersburg. Again Crozet was directed to survey the route but this time the Board of Public Works was also authorized to borrow $150,000 for the construction.

By this time the Northwestern Turnpike was nearing completion in its approach to Parkersburg. Crozet recognized that the choice of locations of the western section would depend upon what the legislature viewed as the purpose of the road. He put the question to the Board of Public Works, stating:

> . . . if the intention of the improvement be to effect the most economical connexion with Parkersburg, I would then . . . unite the new road with the Northwestern Turnpike near Middle Island Creek.
>
> But if the consideration of expediency prevail, and the benefits to be conferred to the fine but unsettled district of country lying about the Little Kanawha in the counties of Randolph, Nicholas, Braxton, Lewis, and Wood, I should think it proper, on the contrary, to depart as far as possible, without too much increase of distance, from the Northwestern turnpike . . .
>
> . . . very extensive surveys through this unexplored country, must necessarily precede the locations, and much expense, time and controversy will be saved by a legislative decision.

The Board's response reflected its intent to open the undeveloped areas even if the cost was somewhat higher.

When the survey was completed in 1840, Crozet was pleasantly surprised that the grades were much lower than he had expected and would provide one of the easiest passes over the "backbone" of the state. Construction began simultaneously toward the middle from both Staunton and Parkersburg. The $150,000 ran out with a 46-mile gap between Beverly and Weston yet to be completed. Because of the depression of the early forties, money to complete the road was not available until 1845. Initially, Crozet believed that only a few bridges would be required but after construction had started he was forced, in 1841, to submit an estimate of $34,400 for 16 bridges. Despite this and subsequent requests, obtaining sufficient money, particularly for building the bridges, continued to be a problem because of both the depressed economic conditions and the impression that had been created by Crozet's original estimates.

Based upon his experience with the Northwestern Turnpike, Crozet favored abandoning the contract system before getting entangled in it, particularly because of his successful experiments on the Northwestern with the state force system that were described in the November 1974 "Backsights" ("The Northwestern Turnpike"). But a contract for the first 20-mile section west of Staunton was let on August 11, 1838, to George Geiger and David W. Patterson, the latter a member of the Senate of Virginia, but both rank amateurs in road construction. Their hopes that "zealous devotion to the duties enjoined would soon give knowledge and in some degree make up for the lack of experience" were ill founded and the results were a disaster. Despite this and other experiences, the road was built for the most part by contractors.

Following completion of the turnpike, the office of general superintendent was conferred upon William Hamilton. His entire career was fraught with great controversy, which had begun when he had been awarded, over a local candidate, the post as superintendent of construction of the final section of the road. He retained the superintendent's post until 1851 and thus presided

over the macadamizing of the route, beginning in 1849. To his credit, he recommended macadam over planking when the latter came in vogue.

Following Hamilton, the office changed hands often and became a political plum. In 1853, Hampton Johnson, son of Governor Joseph Johnson, was selected for the job as described by one of the participants, William L. Jackson, who wrote:

> . . . Today the appointment of Superintendent of the S&P Road was made. The vote stood thus: for Jackson, Johnson and Jackson, for Hamp. Johnson (son of Gover.) Parker, Butler and Gov. Johnson. The Governor securing the election of his son by the casting vote. Comment is unnecessary. The Governor has been sugaring old Parker and Butler for some time.

The tolls on the Staunton and Parkersburg were significantly less than those on two other area routes, the Staunton and James River and the Jackson Turnpikes, which caused nagging financial troubles. After 1845 the legislature began to provide additional funds, particularly for construction of bridges. Hamilton reported at the close of 1848, "We have at this time on the line 50 bridges, 23 of which I have raised with the last 16 months."

Unfortunately, 1848 also brought floods that inflicted nearly $10,000 damage to the route's bridges alone. But this was only the beginning. In 1852 occurred an even more devastating flood as reflected in the petition of the Wood County Court requesting $25,000 to repair the damage:

> . . . that amount at least will be required to replace the bridges, and repair the said road, between this place Parkersburg and Weston . . . Eight of the most important bridges, having washed either entirely away or so injured, that the rebuilding of the same is absolutely necessary . . . as the bridges and road now stand there is no possibility of its ever again becoming the great and indispensable *[sic]* convenience and public highway which it has heretofore proved itself to have been.

The legislature did not attempt to restore the road but allowed it to deteriorate throughout the fifties. Thus the 25 years of planning and construction which culminated in the Staunton and Parkersburg Turnpike ended with a decade of neglect. With the approach of the Civil War, the legislature recognized the strategic importance of the route and appropriated $12,000 for its repair in 1860, but this was too little and too late.

Despite the relatively short service life of the route, its length and the ambition of its purpose as one of the state's thrusts westward to the Ohio earn for it the appellation "Nineteenth-Century Superhighway."

The Southwestern Turnpike

Howard H. Newlon, Jr.

["Backsights" No. 22: originally published in the *Bulletin*, March/April 1975]

The last and by far the most successful of Virginia's four nineteenth century superhighways was the Southwestern Turnpike, which followed approximately the present route of U.S. 11 between Buchanan and Bristol. The residents of the Southwest had watched with interest and growing hopes as first the Kanawha, begun in 1820; then the Northwestern, chartered in 1831; and later the Staunton and Parkersburg, started in 1836, provided what is now West Virginia with connections for travel and trade with the commercial centers of eastern Virginia. These hopes were buoyed when the General Assembly on February 21, 1835, authorized the Board of Public Works to purchase at $100 each, 400 of the 1,000 shares of the Southwest Turnpike Company, which in the act was directed to construct a road from Buchanan via Salem to "some point on the state line within the county of Washington." Despite the enthusiasm of the residents, the effort suffered the same failure to secure private capital as the initial attempts by the Northwestern and Staunton and Parkersburg Companies. A similar fate was to befall the initial effort by the Lynchburg and Tennessee railroad chartered by the General Assembly a year later in 1836. The attempts by the General Assembly to promote simultaneously both a turnpike and railroad connection with southern states were a matter for considerable discussion for almost 10 years, and many of the views expressed by proponents of the different transportation modes are in many important respects the same as are heard today.

When it became apparent that private funds to construct the road would not be forthcoming, the petitioners turned again to the General Assembly for direct state financing, which had been used for both the Northwestern and the Staunton and Parkersburg roads. A plethora of well-written and well-documented petitions extolling the rich mineral and other natural resources descended upon the legislators.

Crozet agreed that an improvement was desirable, noting in 1839 that "the demonstrations in the south threaten to divert from Virginia her trade with Tennessee, and withdraw its revenue from the James river." He believed a railroad to be more efficient than a turnpike, but was willing to accept a turnpike as either better than nothing or complementary to any railroad. Continued lack of response by the legislature led a number of the southwestern counties to send delegates to a convention held in Christiansburg on October 25, 1841, more than six years after the original authorization of the road by the General Assembly. The outgrowth of this convention was an even more elaborate petition pointing out the potential detriment to the area of the railroad then under construction between Charleston and Tennessee.

In 1841 Crozet furnished detailed estimates of the cost of a railroad or a turnpike from either Lynchburg or Buchanan to the Tennessee border. He had estimated the cost of the railroad from Buchanan to Tennessee as $4,140,000 and the turnpike road at $710,000. He estimated the price of transportation per ton mile as 4 cents by rail and 15 cents by road.

The legislature was still unmoved and the depression years between 1841 and 1845 silenced even the petitioners. In 1845, however, the legislature once again became interested and another convention was held that included representatives from Tennessee. They decided to appoint a committee of six—three from Virginia and three from Tennessee—to petition the legislatures in the two states for construction of a road to connect the James River with appropriate Tennessee public works. Wyndham Robertson, who had lately been governor of Virginia, was selected to be chairman, but his refusal of appointment reflected the strong differences of opinions on the relative merits of road versus rail. During his tenure as governor, the Lynchburg and Tennessee Railroad had been chartered, and since he felt strongly that the plans for a macadamized road reflected only despair over the prospects for a railroad, he could not do justice to the effort. The Virginia and Tennessee Railroad was eventually to come, but the time was not ripe. By an act of January 28, 1846, eleven years after the initial act, the legislature authorized the Southwestern Turnpike Road for direct state financing.

The road was expected to cost more than its three predecessors since it would incorporate the best features of all of them. It was constructed to high standards and when in 1848 Superintendent Charles Shaw reported that the $300,000 authorized by the legislature had been expended, with the road only half built between Salem and Tennessee, Crozet's original estimate appeared to be very close. The road was completed to Seven Mile Ford in Smyth County entirely with state money. After 1850, the Turnpike was financially on its own and was completed with private funds as the legislature turned its attention to building the Virginia and Tennessee Railroad.

The Southwestern Turnpike was built after the beginning of the railroad era in Virginia. Attempts to accommodate the divergent views as to which mode was better took various forms. One of the most interesting was an attempt by the legislators to designate a route location that could be used for either a turnpike or a railroad, so that the turnpike, if started, could be converted to a railroad should money be forthcoming. Crozet heard rumors of this plan and opposed it as early as 1842, pointing out the differing design requirements, particularly grades. The legislators were still enamored of this idea, and in 1848 the Board experimented with conditional contracts by which the unfinished portion could be declared null and void should the railroad be authorized. The provision was short-lived, because contractors were unwilling to bid on such conditions.

The talk of constructing a railroad revived from time to time, and in 1851 Col. James H. Piper directed to the Board of Public Works a long and detailed recitation of the economics of road transportation. He pointed out that the two modes while competitive served different clientele. He closed with words that are perhaps as prophetic as any concerning the future of transportation that were written in Virginia during the nineteenth century:

> But, however great may be the benefits arising from a railroad, (and this fact is not controverted,) the turnpike, nevertheless, being open and accessible at all times and to all persons, in whatever manner they may wish to use it, whether with wagons, carts, carriages or horses, upon which every man is at liberty to become his own carrier and to regulate his own movements, will be emphatically the road for the people.

Col. Piper with great perception described what has subsequently become the love affair between the individual and his vehicle.

The railroad was ultimately built, but whereas the Northwestern Virginia Railroad between Parkersburg and Grafton had in essence destroyed the Northwestern Turnpike, the Southwestern continued to be a growing enterprise, characterized in 1860 as carrying "a great deal of travel . . . of the heaviest kind." Apparently the reason was that the Southwestern was built to high standards and carefully maintained. Complaints about toll evasion, which were common on the other roads of poorer quality, were almost totally absent on the Southwestern. The lesson to be learned apparently was: if the road was of high quality, it could sustain itself.

During conception, construction and operation of the Southwestern Turnpike, there was much controversy as to the virtues of the turnpike versus the railroad. Each ultimately took its rightful place. It is interesting to note that the southwestern counties, which had both a state-financed turnpike and railroad, remained in Virginia, whereas those counties in which not a mile of railroad was built by the state ultimately were bound to West Virginia; and furthermore, the three long superhighways in these latter counties were essentially defunct by 1860. Perhaps these developments are coincidences, but perhaps they vindicate Col. Piper's vision of good turnpikes and railroads as indispensable components of an integrated system of transportation and of his recognition of the needs for "roads for the people."

Note: This is the last of a five-part series on Virginia's nineteenth-century superhighways. The articles have been based upon original records of the Board of Public Works and in great part upon a dissertation entitled "The Turnpike Movement in Virginia," by R. F. Hunter, Columbia University, 1957. He first characterized these roads as "superhighways." At the time this article was written, and for many years thereafter, Professor Hunter was on the faculty at VMI.

Edward Lorraine's Nine-Mile Tunnel

Dr. William E. Trout III

["Backsights" No. 23: originally published in the *Bulletin*, May/June 1975]

[NOTE: At the time this article was originally published, William E. Trout III, Ph.D., the author, was a geneticist at the City of Hope National Medical Center, Duarte, California, and was Vice-President of the American Canal Society. He has subsequently served as president and board member of the American Canal Society and as co-founder and board member of the Virginia Canals and Navigations Society. He is a native of Richmond and is the author of numerous articles and books on historic canals and navigation.]

If engineering projects were successful in proportion to the energy put into them, then it is a certainty that a century ago the James River and Kanawha Canal would have been completed across the Alleghenys and thus provided the nation with an all-water route for bulk transport from the interior of the country to the Atlantic Seaboard. The influence of the canal upon the road building efforts in Virginia has been the subject of several prior "Backsights." "The Great Central Water Line from the Ohio River to the Virginia Capes" had no lack of enthusiastic support from the beginnings of the canal in 1785 (with George Washington as honorary President) up to the last minute in 1880 when the canal was transformed into a railway, now the C&O. One should not belittle the JR&K Company, even though it never completed its canal. It was one of the largest corporations in the nation and did, in fact, construct a transportation route across the Alleghenys, composed of the 196-mile JR&K Canal from Richmond to Buchanan, 60 miles of the steamboat navigation on the Kanawha up to Charleston, and the 208-mile JR&K Turnpike (now Route 60) connecting the two.

But this route was not nearly adequate to draw the trade of the growing Midwest or to carry the coal and ore of the Kanawha Valley. "I think we have coal enough for the canal," wrote Dr. John P. Hale of Charleston, "and I hope Congress will give us canal enough for the coal."[1] A typical sentiment was expounded by Edward A. Pollard in his 1871 guidebook, *The Virginia Tourist*: "The Water Line of Virginia, in its conceptions, is one of those large works of the industrial enterprise of the age, which rises above the boundaries of statistical and commercial details to the dignity of a monument or a poem . . . The James and Kanawha are the two arms of the state—one laid on the mane of Ocean; the other coming in the distance to smiling and not unwilling fields to bring their treasures to the crouching wave."[2]

[*Image in original:* Photograph of Edward Lorraine. *No caption.*]

The man most thoroughly familiar with the proposed route between "the smiling fields" and "the mane of Ocean" was Edward Lorraine (1818-1872), a gifted, conscientious and modest man who deserves a place in American engineering history. Born in New Orleans, he grew up in Richmond, and graduated from William & Mary in 1837 with a course in mathematics, natural history and civil engineering.[3] Joining the JR&K Company as a rodman, he quickly rose to the position of assistant engineer in 1840, working on the western division of the canal, then under

construction west of Lynchburg. His scruples, however, would not let him accept an order by the board of directors that he must visit the works every day, a requirement that would take him from pressing duties which required his personal attention. Resigning, he began a course in medicine with the intention of becoming a physician, and took several jobs in Petersburg (including Postmaster), before finally returning to the Company in 1847 as inspector of boats in Richmond. The next year he was assistant engineer again, on the western division, and in 1854 he became chief engineer and superintendent of the whole JR&K enterprise, a position which he held during the war and until his death from smallpox in 1872 at the age of 54. Edward Lorraine was a gentleman well-known for his accurate surveying and the excellence of his maps: and a fellow engineer wrote of him: "He knows everything about water that is known." His name still lives after a fashion in the never-begun Lorraine Tunnel and in the ghost town of Lorraine near Richmond. He also lives in the many reports and surveys of the canal which can still be seen in the Virginia State Library and contain untold stories of the canal era. *[NOTE: The Virginia State Library is now the Library of Virginia.]* But there was another aspect to Edward Lorraine, for in addition to being a nationally known hydraulics engineer he was a master of satire—in prose and verse—who wrote editorials in the *Richmond Examiner* and the *Southern Opinion,* and was considered by the writer of his obituary in the *Richmond Enquirer,* to be "one of the most brilliantly gifted writers of this State." He was also an artist and published a series of scenes along the Kanawha and New Rivers in the March 1873 issue of *Lippincott's Magazine*. A search for Lorraine's writings should be rewarding. Most of his editorials are probably unsigned; but happily a letter to his daughter has survived which not only bring to life his sense of humor but gives us an inside look at life in a surveying camp at the summit of the proposed canal.[4]

Camp Tuckahoe Sep 11 -1870

My dear Florence

Although I have not received your letter, yet as I know that you have written to me I will treat you just the same and respond to your kind intentions. We have a very ignorant and careless post-master at the Springs and I suppose that he has put your letter in the wrong place. Direct hereafter to Box 182 and I will be more apt to get my letters. I moved down to Camp yesterday and slept in Camp last night for the first time since I have been out. We are located on Tuckahoe Creek four miles east of the White Sulphur Springs in a nice level clover field in a valley between two mountains, the creek running as clear as crystal close by our tents, and a cool spring bursting out from the rock on the margin of the creek. We got a nice little No 7 Cooking Stove from Richmond yesterday, and had a very good breakfast this morning, consisting of coffee, tea, short cakes, waffles, fried chicken, and fried fish caught from the (p. 2) creek yesterday evening. Our Cook whom we picked up by Chance at Alleghany Station . . . proves to be much better than we expected. We have not tried him yet in the bread line, but he makes very nice waffles. Ask your mother to send me a recipe for making eggbread. Our Kitchen and dining room are together under a large fly tent. We have a long pine table resting on wooden horses. Our Camp stools have not arrived yet so we sit on boxes, barrels, and improvised stools made of plank and very rickety. If you put too much on one side of your mouth they are very apt to turn over. The stove is in one corner, and the pots & pans are hung up on the tent poles. We have a large lot of well grown chickens that roam about the Camp perfectly at home and industriously getting fat for our accommodation. We have four wall tents, like those in the picture in the parlor. Four of us sleep in a tent, and one tent is used as a store room and the Cook's sleeping apartment. But we are rather crowded as our (p. 3) tents are small. The way we sleep is this. We spread an India rubber blanket on the ground, then we spread two blankets on them, then make a bolster of pants and coats, spread a sheet over all and lie down close together spoon fashion, and cover with as many blankets as are necessary. There is no straw nor hay to be had any where in this neighborhood, if there was we could sleep more comfortably. The great difficulty is in fitting your bones to the hollows of the ground, and turning over, to all turn at once. One of the natives called on us the

other day and gave us the comfortable information that we were camped directly at a bear crossing. That is where the bears cross over from one mountain to another, and that they would certainly pay us a visit, especially if we got any fresh meat. We are about half a mile from the mouth of the Alleghany tunnel on the Chesapeake and Ohio rail road. The other night a man went to walk through the tunnel and just as he was about to enter it he saw a large bear at the entrance of the tunnel, looking in I suppose (p. 4) to see how he would like it for a winter residence; the man shouted, and the bear ran up the hill. Our boys *say* that they saw a bear the other day as they were corning in from work. He was sitting on a high rock on the side of the mountain. They said nothing to him nor he to them. Last week as we were running the line through the woods on the top of Kates Mountain we came across an old hunter in pursuit of a bear which he said he had shot and wounded and had tracked by his blood for five miles. We were glad that he did not pass any where near us, as a wounded bear is a very dangerous animal. When I get any more bear stories I will tell them to you.

I camped in this same valley in April 1851, and the same old couple Mr & Mrs Keys who lived here then and used to supply us with provisions and did our washing, are living here now. The old couple were very glad to see me, and much surprised, as they said I used to be Called the "*Old Engineer*" in 1851. So much for having a white head. Write again soon. Tell your Ma that I look at her picture very often to see her sweet face smiling on me. Love to her and all.

Your affectionate father, E. Lorraine

Lorraine spent a good deal of time on the line of the proposed canal over the Alleghenys, surveying, gauging the water supply, working out the route to the last detail, and spending hours writing reports. The first survey, by General William Gibbs McNeill in 1826, had proposed a short tunnel through the Alleghenys, but in 1869 a whole new dimension was given to the project when Lorraine proposed instead a tunnel nine miles long, with an enormous reservoir in Anthony's Creek. Lower in elevation than the short tunnel, the Lorraine Tunnel (as it became known) would have saved the Company 44 locks, the boatman 7½ hours, and provided a better water supply. This proposal would have been absurd in 1826, but between then and 1869 tunneling technology had progressed by a quantum jump from black powder and hand drilling to nitroglycerine and pneumatic drills. In fact, the legendary battle between steel-driving John Henry and a steam drill took place in 1871, not far away at Big Bend Tunnel on the Greenbrier, where the C&O Railway was building its line and where the canal also proposed to go. We wonder if Lorraine was there to watch!

In 1870 a survey by the Corps of Engineers approved Lorraine's tunnel and the proposed route, and as a result the U.S. House of Representatives declared the project of national importance and worthy of government aid.[5] There was another Corps survey in 1872;[6] and it was while writing up his part of the report that Edward Lorraine caught smallpox and died. He would have enjoyed the visits in 1874 of a U.S. Senate committee and members of the Board of Engineers,[7] for all agreed that Lorraine's proposal was correct, that the canal across the Alleghenys was well worth completing, that it would cost between 50 and 60 million dollars, and that it could be finished within six years. The engineers also offered a number of interesting suggestions regarding the Lorraine Tunnel. They recommended shortening it from 9 to 7 4/5 miles; building it on a curve of 30 miles radius so as to minimize the depth of shafts, as well as the ends, for speedy completion; and constructing the locks at each end in such a way that a flow of water could be directed toward the east, to assist boats heavily laden with coal, ore, and other bounties from the west. They also recommended that the tunnel be only wide enough for one boat, with turnouts for passing and with a towpath unless it was decided to rely entirely on small steamboats pulling trains of canal boats. They noted that the excavation would be rapid because of the soft shale and sandstone strata, but that the tunnel would have to be lined.

The canal itself would be a wide one, with locks taking boats up to 120 feet long and 20 feet wide. The old JR&K canal would be enlarged to these dimensions and extended up the James to Iron Gate, up the Jackson River to Covington, up Dunlap's Creek to Fork Run Creek (now Tygers Creek), up Fork Run Creek 1½ miles to the tunnel, passing under Tuckahoe and Kates Mountains to a point 2½ miles above the Greenbrier River on Howard's Creek and 2¾ miles below White Sulphur Springs, and continuing by lock-and-dam navigation down the Greenbrier and New to the Kanawha.

But since the government never offered 50 million dollars for the project, all these bold dreams and painstaking studies came to nothing. The canal company even started to build a railway in 1876 to link the canal at Buchanan with the C&O Railway at Covington, but the flood of 1877 washed those hopes away. After almost a century, the canal finally came to an end when it was sold in 1880 to the Richmond and Allegheny Railroad (now the C&O) and rails were laid along its towpath. You can see today where the canal was supposed to be. The C&O passenger route follows it from White Sulphur Springs down to the Kanawha; you can drive up Dunlap's Creek on Route 159, and Tygers Creek on Route 311; and you can take Route 92 from Alvon to Neola, both of which would have been inundated by the great reservoir on Anthony's Creek. But if you take U.S. 60—*that* is the Old James River & Kanawha Turnpike, the canal company's very real transportation corridor across the Alleghenys which helped link "the smiling fields" with "the mane of Ocean"; and still surviving is its famous Humpback Bridge, 4 miles west of Covington.

Acknowledgments

Miss Helen Lorraine of Richmond, Robert S. Mayo of Mayo Tunnel & Mine Equipment Co., and the Reynolds Metals Co. Canal Committee.

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Early Virginia Road Markers: 1725-1828

Dan Deibler and Nathaniel Mason Pawlett

[“Backsights” No. 24: originally published in the *Bulletin*, July/August 1975]

[NOTE: At the time this article was written, Dan Deibler, the author, was a Research Analyst at the Virginia Highway and Transportation Research Council, now the Virginia Center for Transportation Innovation and Research.]

Although an act of the Virginia Assembly in 1738 ordered surveyors of roads in each county “where two or more cross roads or highways meet, forthwith to cause to be erected, in the most convenient place, where such ways joyn, a stone or post with inscriptions thereon, in large letters, directing to the most noted place to which each of the said joining roads leads,” no stones have yet been discovered which were erected as a direct result of this act.

There is a stone marker in Fluvanna County dated 1725 which may have been a road marker, but this was erected before the passage of the act. *[NOTE: Subsequent research indicated that this stone was a land boundary marker.]* From the extant road orders it appears that most markers erected in the eighteenth century were of the post and board type being examined by Dr. Syntax in the accompanying print by Thomas Rowlandson (1756-1827) and that stone was little used until 1800 or thereafter.

The 1725 boundary marker in Fluvanna County.

"Dr. Syntax Losing His Way" (detail) a ca. 1809 print by Thomas Rowlandson.

One particularly fine stone marker is located near Brunswick Court House on the Old Stage Road connecting Petersburg with Halifax, North Carolina. Farther south on this road is another stone directing travelers to "Randolph's Ordanary" and bearing the date 1825.

In Fluvanna County there are a number of stone markers, several of very high quality, erected by the noted planter, agricultural reformer, and associate of Thomas Jefferson, John Hartwell Cocke (1780-1866), during his tenure as surveyor of roads in the 1820s. The Virginia Highway and Transportation Research Council, as part of its continuing research into the history of road and bridge building technology in Virginia, would like to know of other markers, milestones, or mileposts still in existence.

The 1794 Brunswick County stone.

The 1825 road stone at Valentines, Brunswick County.

One of the Fluvanna County road stones erected by John Hartwell Cocke.

The Lowest Office: John Tyler as Overseer of Roads

Nathaniel Mason Pawlett

["Backsights" No. 25: originally published in the *Bulletin*, September/October 1975]

Born in Charles City County and educated at the College of William and Mary, John Tyler (1790-1862) began the practice of law in his native county in 1809. In a career spanning some 50 years he held many offices, among them U.S. Congressman (1817-1821), Governor of Virginia (1825-1827), U.S. Senator (1827-1836), Vice-President of the U.S. (1841), and President (1841-1845). Possibly the lowest position in which Tyler ever served was that of overseer of roads in his native county, following his tenure as President of the United States. This article will be concerned with his appointment to this, "the lowest office."

[*Image in original:* Engraving of John Tyler. *Caption:* John Tyler.]

The turbulent years following the decay of the Republican Party of Thomas Jefferson saw the rise to power of Andrew Jackson and the beginnings of our present two-party system of politics. It was a period of changing alignments, of coalitions formed only to disintegrate as new political issues came to the fore. Through it all some men were able to maintain a consistent political philosophy, though it was often necessary for them to change parties in order to do so. John Tyler was such a man.

Consistent in the states rights, strict constructionist political philosophy that he held throughout his career, he found himself allied with the Clay-Calhoun-Whig coalition which formed itself in the 1830s in opposition to the policies of Andrew Jackson. Nominated by the Whigs in 1840 for Vice-President along with William Henry Harrison for President (the latter also a native of Charles City County though a resident of Ohio), he found himself elevated to the higher office upon Harrison's unexpected death on April 4, 1841, after only a month in office.

Though nominally a Whig, Tyler still maintained a belief in his "Old Republican" states' rights principles. Indeed his nomination had originally been designed as a means of ensuring the loyalty of the followers of John C. Calhoun of South Carolina in the election of 1840. Not unexpectedly, this strange marriage was short-lived, and Tyler's administration was marked by intense intraparty conflict. Adhering stubbornly to his old principles, John Tyler was abandoned by most of his own party, the Whigs, and came increasingly to act with the Democrats. This earned him the enmity of most of the Whigs on the state as well as the national level by the time he completed his term as President.

Upon his retirement from public office in 1845, Tyler returned with his young bride, the former Julia Gardiner of New York, to Charles City County and a plantation which he named Sherwood Forest. This name originated with a Whig jest which likened Tyler to Robin Hood who stole from the rich (the Whigs) and gave to the poor. Many of the principal members of the gentry of Charles City County were Whigs, and the Tylers received a somewhat cool reception. Indeed, in August 1842, these same Whigs had held a meeting at which President Tyler's

policies were condemned and he was branded a traitor to their party. These Whigs dominated the social, economic, and political life of the county and retribution for Tyler's political apostasy was not long in coming.

[*Image in original:* Sherwood Forest. *Caption:* Sherwood Forest, Charles City County.]

The Gentlemen Justices of the Whig-dominated County Court appointed Tyler overseer of roads with responsibility for maintaining the road on which he lived. For one whose last office had been the highest in the land to be translated to this, very nearly the lowest office in the land, must have been viewed by the Whigs as the ultimate humiliation for John Tyler. The county clerk rode out to notify him of his appointment in person, no doubt in the hope of seeing Tyler refuse the appointment and pay the fine for nonperformance of the duty. Although the Democratic papers gave this incident great publicity, Tyler always explained it by saying that only he and an old lady lived on the road and that he was the logical choice for the office.

Tyler accepted the office with good grace and, discharging its duties efficiently, proceeded to turn the tables on those who had expected to be able to gloat over his humiliation. As overseer of roads, Tyler had the authority to summon all the "Male Labouring Titheables" who dwelt on his road whenever he deemed repairs necessary. He therefore commenced his duties with great diligence. The road in question being very undulating and gully-ridden as were most Virginia roads of the time, he elected to cut down the hills and fill the gullies and hollows and make it an example of what could be accomplished by local Overseers of Roads. Summoning all hands, he set to work in earnest. Day after day the work continued, for the law of the state of Virginia put no limits on the time which could be spent working on the roads. The effects were soon, not only on the road but in the mournful silence prevailing on the adjacent plantations owned by Whigs, whose slaves were labouring day after day on the road to the neglect of their crops. It was the harvest season, and the wheat, golden in its ripeness, would brook no delay. But delay was all that it could get, for the hands were still busily engaged upon the road, day after day. The smiles which had been seen upon the faces of the Whigs when Tyler's appointment as overseer of roads was considered humorous had now turned to scowls, and the snickers had turned into groans of dismay.

The august Gentlemen Justices of Charles City County Court who had made the appointment determined to call upon Mr. Tyler at his home to remonstrate with him concerning the state of things. Upon hearing their arguments, Mr. Tyler replied that, according to law, it was the duty of an overseer of roads to put his road in good condition and to keep it that way. The Whigs pleaded with him. Mr. Tyler was as firm now as he had been when he was President of the United States. Next they begged him to resign his office and allow their hands to return home to the harvest. But in his reply, John Tyler said that, as offices were hard to obtain in these times, and having no assurance that he would ever get another, he could not think, under the circumstances, of resigning. And so, John Tyler, even when translated from the highest office in the land to the lowest one, remained victorious over the crestfallen Whigs.

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John Randolph Abroad: A Christmas Trip

Nathaniel Mason Pawlett

["Backsights" No. 26: originally published in the *Bulletin*, November/December 1975]

John Randolph of Roanoke (1773-1833), probably the most famous member of this Virginian family, served in the House of Representatives (1799-1813, 1815-17, 1819-25), and in the U.S. Senate (1825-27), and was later Minister to Russia (1830).

A 19th century engraving of John Randolph of Roanoke.

Thomas Jefferson's floor leader in Congress (1801-05), he afterwards turned on Jefferson, becoming a bitter opponent of the centralising tendencies inherent in the federal government. A brilliant orator and master of biting invective, he was later instrumental in the assault on John Quincy Adams's administration that began in 1826 and ultimately resulted in the election of Andrew Jackson in 1828.

The following account of his four-day trip from Richmond to Washington in December 1821 is from *The Life of John Randolph of Roanoke* (New York, 1850), by Hugh Garland.

1821, December 10th, Monday, half past 11, A.M. Left Richmond. Four miles beyond the oaks met Mrs. T-b and poor Mrs. R-h. Reached Underwood half an hour by run, and pushed on to Sutter's, where I arrived quarter past five. Very comfortable quarters. Road heavy.

11th, Tuesday. Breakfasted at eight A.M., and reached Battader by quarter past twelve. Fed my horses and arrived at Fredericksburg half-past three. Road heavy. Mansfield lane almost impassable. Excellent fare at Gray's, and the finest oysters I have seen for this ten year.

12th, Wednesday. Hard frost. Left Fredericksburg at nine, A.M. Reached Stafford, C. H., at half-past eleven, Dumfries at five minutes past three, P. M., and Occogoun at half-past five. I made no stop except to breathe the horses, from Dumfries to Neabsco, sixty-five minutes three and a half miles. The five miles beyond Dumfries employed nearly two hours. Roads indescribable.

13th, Thursday. Snow; part heavy rain. Waited until meridian, when, foreseeing that if the roads froze in their then state, they would be impassable; and that the waters between me and Alexandria would be out perhaps for several days, I set out in the height of the storm, and through a torrent of mud, and water, and sloughs of all degrees of viscidity, I got to Alexandria before five, where a fine canvas-back, and divers other good things, set my blood into circulation.

14th, Friday. Bitter cold. Reached Washington half-past eleven. House does not sit to-day. Funeral. No southern mail. Waters out.

15th. Very cold. No southern mail. Waters out. Just beyond Pohick I met a man driving a double chair.

J. R.-"Pray, sir, can I ford Accotink?"

Traveller.-"If you drive brisk perhaps you may."

J. R.-"Did you cross it, sir?"

T .-"Yes; but it is rising very fast."

. . . Pohick a most dangerous ford at all times, from the nature of the bend of the stream, which is what is called a kettle-bottom, was behind me, and no retreat and no house better than old Lear's hovel, except the church, where were no materials for a fire. When I reached Accotink, the sandbank in the middle of the stream was uncovered; but for near a mile I was up to the saddleskirts. A great price, my good sir, for the privilege of franking a letter, and the honor of being over-looked by the great men, new as well as old.

Just at the bridge over Hunting Creek, beyond Alexandria, I met the mail cart and its solitary driver. The fog was Cimmerian.

J. R.-"How far do you go to-night, friend?"

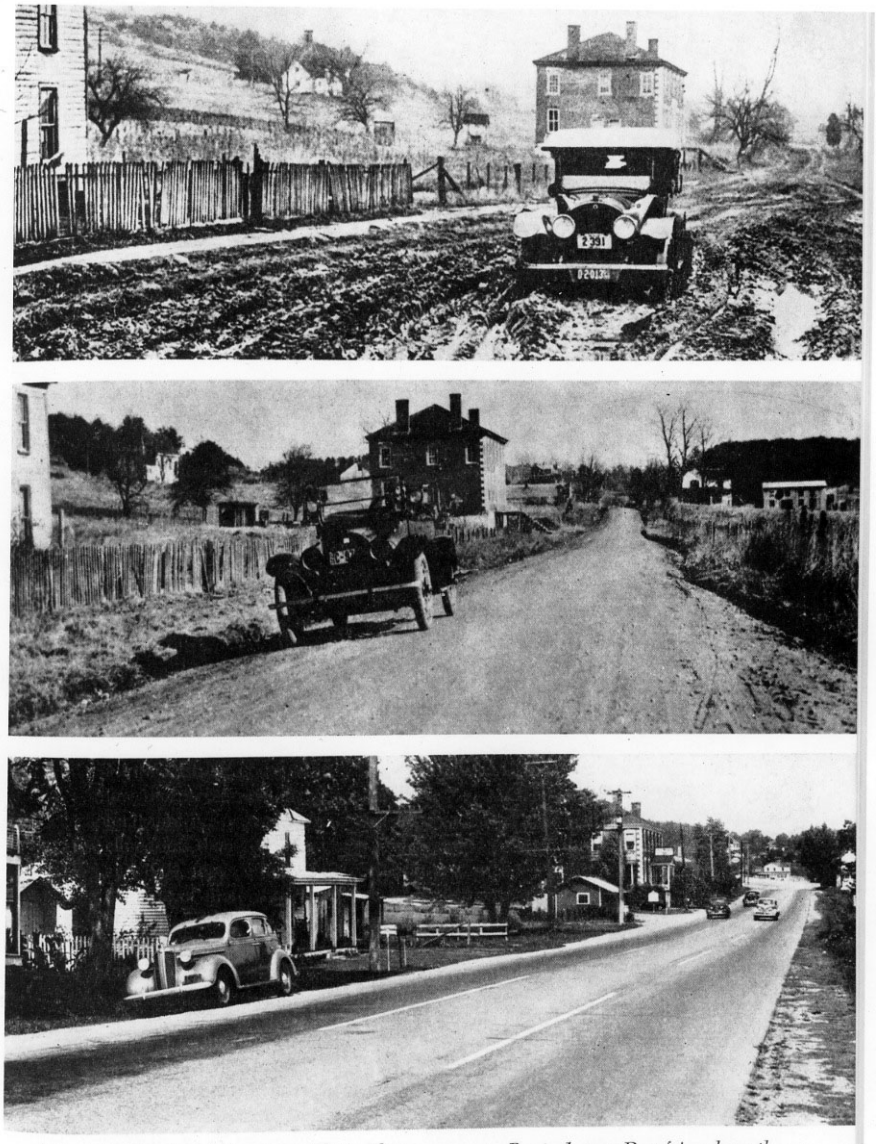
D.-"To Stafford Court-house, sir. Can I ford the Accotink?"

J. R.-"I think you may; but it will be impossible before midnight: I am really sorry for you."

D.-"God bless your honor."

I am satisfied this poor fellow encounters every night dangers and sufferings in comparison with which those of our heroes are flea bites.

Thus may this account of John Randolph's 96-hour ordeal provide an opportunity for a continuing appreciation for the convenience of our modern highways to any who during the holiday season may enjoy the two-hour trip between Richmond and Washington.



The road through Dumfries (now U.S. 1) in (top to bottom) 1919, the 1920s, and around 1940. One hundred years after John Randolph traveled it, the road remained virtually unchanged.

The Three Notch'd Road

Nathaniel Mason Pawlett

["Backsights" No. 27: originally published in the *Bulletin*, January/February 1976]

Of the many colonial roads constructed during the eighteenth century as settlement moved across Piedmont and Southside Virginia, a few have remained virtually intact and in service as state roads over most of their length. One of the most significant of these is the Three Notch'd or Three Chopt Road, which ran from Richmond to the Valley as a main east-west route from the 1730s to the 1930s, when it was superseded by U.S. Route 250.

Three Notch'd Road near Gum Spring (photographed in the 1970s).

Although the road appears on late eighteenth-century maps, it can first be specifically located on the maps prepared by the Confederate Engineers, and these indicate it on its present course from Richmond to the Valley. In the beginning the road was probably an Indian and game path, but as settlers moved into the upper Piedmont, various sections of it were gradually improved to the standards of a road during the 1730s. A road order issued by Goochland County Court in June 1733 called for a road to be opened "from the Mountains [the Southwest Mountains] down the ridge between the North River [Rivanna] & Pamunkey River [South Anna] the most convenient way . . ." In the spring of 1734 Peter Jefferson became surveyor of this road, which came to be called the Mountain or Mountain Ridge Road. From that time, orders concerning this road were issued frequently as the settlement of the present area of Albemarle County got under way.

In the following years the western portions of this road were constructed so that by 1742 at the latest a road was open to Staunton (then Beverley's Mill Place). Already, in 1737, this road had a system of numbered mile markers, most of these probably numbers incised or painted on trees and running from west to east. No. 0, located near the present Ivy, was evidently the D. S. Tree, a tree on which were carved the initials of an early settler named Davis Stockton. No. 12, "the twelve

mile tree," was located near Shadwell, and Nos. 36 and 40 were in the lower end of Goochland County. It is likely that Peter Jefferson, the father of Thomas, was responsible for these mile markers since they first appear in the records just after the end of his tenure as surveyor of the Mountain Road.

For the first decade of its existence, the name Mountain Road was regularly applied to this road. The first use of the name "three notch," "three notched" or "three notch'd road" occurs in a Louisa County ordinary license of 1743. A few days later the name appeared in Goochland County records and was regularly used there and in Albemarle County, which was formed from Goochland in 1744. This name seems to be the preferred original name, maintaining its popularity down to the Revolution although "three chopt" or "three chopped" appears occasionally. The old name, Mountain Road, evidently rapidly fell from favor, although as late as 1755 an advertisement in the *Virginia Gazette*, published in Williamsburg, refers to it as the "Three notched mountain road."

By the time of the Revolution the Three Notch'd Road was a well-known road almost a half-century old. As such, it played a significant part in the events leading to the climactic surrender at Yorktown. In early June 1781, when Colonel Banastre Tarleton and his Dragoons rode toward Charlottesville in the hope of surprising Governor Thomas Jefferson and the General Assembly, which was meeting there, it was over this road that Jack Jouett rode to warn them of impending doom.

A few days later, on June 13, 1781, the Marquis de Lafayette, by a clever night march from his camp in the Green Springs in Louisa County, secured a position commanding the Three Notch'd Road at its crossing of Mechunk Creek, thus thwarting the movement of Earl Cornwallis and his army toward the munitions stored at Albemarle Old Court House near Scottsville and beginning the British retreat which would end at Yorktown.

Giles Allegre's Tavern on Mechunk Creek, opposite which Lafayette encamped in June 1781 (photographed in the 1970s).

Today, the Sunday driver or tourist may enjoy much of the same pristine rusticity which met the eye of the eighteenth-century traveler as he wound his way along the ridge tops westward from Richmond toward the Blue Ridge Mountains. In many places, silence causes the mind's eye to conjure visions of Mr. Jefferson on his way from Monticello down to Williamsburg or the solitary tobacco roller with his hoop-encased hogshead bound for Richmond.

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Map Maker Extraordinary

Howard H. Newlon, Jr.

["Backsights" No. 28**:** originally published in the *Bulletin*, March/April 1976]

In this Bicentennial year, road maps numbering hundreds of millions will be distributed by government and private sources to aid travelers seeking to renew their ties with America's past. About 2.5 million copies of the Department's Official State Highway Map are being prepared.

Indeed, few modern travelers would venture forth without the many maps and directional signs that are a vital part of today's travel. But to the eighteenth-century traveler such helps were not available, and in the words of one 1776 commentator, ". . . getting lost has become the number one travel problem . . . blazing notches in tree trunks does not make a road . . ." In Virginia, prior to the Revolution, most early maps concentrated upon delineating the abundant rivers and streams that served as the main arteries of travel in Tidewater. In fact, significant progress toward providing useful road maps came almost a century later in response to the needs imposed by the Civil War.

One enterprising individual who recognized the need for road maps and who set out to remedy the situation was Christopher Colles. The fruits of his labor were published in 1789 under the title *A Survey of the Roads of the United States of America,* and this was the initial attempt to produce a United States map specifically devoted to roads.

[*Image in original:* Christopher Colles. *Caption:* A portrait of Christopher Colles.]

Colles, a somewhat eccentric but visionary engineer and scientist, had been living in Philadelphia since 1771, when he had emigrated from his native Ireland following the death of his Uncle William with whom he had worked on a variety of canals and other engineering projects. In 1769, when he proposed to map the city and suburbs of Limerick as his first cartographic project, he had signed himself as "Director of Inland Navigation of the Shannon."

Immediately after landing in America, Colles, through advertisements in the local papers, began simultaneously to solicit work designing hydraulic engines, to give public lectures on a variety of subjects, and to instruct young men in "different Branches of Mathematics and Natural Philosophy." His lectures seem to have been his most successful enterprise. During the Revolution his activities are unclear, but he early cast his lot with the American patriots and there is some evidence that he was attached to the Artillery Department**.** In any event, he spent the years 1776-1783 traveling in New York, New Jersey, and Pennsylvania.

Apparently inspired by his surveying and mapping experiences during the Revolution, Colles began, about 1784, to compile information for his road survey and to have the plates engraved. In 1789 he issued a broadside outlining the plans for the book and stating that each

purchaser would pay "one quarter dollar at the time of subscribing (to defray several incidental charges necessary to the work) and one eighth of a dollar upon the delivery of every six pages of the work."

In its final form, the book consisted of a title page and 83 small maps that trace the major roads of the country from Albany, New York, on the north, and Stratford, Connecticut, on the northeast, southward to Yorktown and Williamsburg, Virginia. These maps are in the form of a continuous strip with two or three stretches of road presented on each plate. Strip maps are an ancient form. The Peutinger Table [the early map of the Roman Empire] contains a map of the Appian Way that is 25 feet long; this map, made in the thirteenth century, was based upon an earlier one prepared in the third century. Colles made no attempt to orient the maps in a consistent manner, but a north arrow was placed on each strip.

Colles himself surveyed many of the northern areas, using a perambulator, a device that automatically recorded the revolutions of a large wheel as it was pushed along the ground. Although this device was not original with Colles, his inventive mind undoubtedly was directed toward refinements to speed up his task. The information for the southern areas of Maryland and Virginia was probably drawn from surveys made by Robert Erskine and Simeon DeWitt, military geographers for the Continental Army at the order of General Washington.

Although the title page carries the date of 1789, the project probably continued through 1791-2. Continually short of funds, Colles periodically sought support from various state legislatures and finally, in 1790, appealed to the U.S. House of Representatives. His request was favorably supported by the Postmaster General, but the young nation was confronted with too many problems to worry about roads and road maps. No aid was forthcoming. Somehow Colles continued the survey for a time. About 1792, after the completion of 83 plates and the mapping of approximately 1,000 miles (100 plates and the mapping of 1,200 miles had been originally envisioned), the project was abandoned.

While the maps are crude by present-day standards, they were for their time unusually complete in both their physical and cultural features. Towns, villages, and many individual farmsteads, along with the names of their occupants, were indicated. Tavern, gristmills, sawmills, blacksmith shops, meetinghouses, and "gaols" are among the public buildings identified. Churches were identified by name and denomination. Many of these features are seen in the accompanying plate (Plate 66)**,** which identifies Pohick Church (the X above indicating Episcopal), Delany and McAllister residencies, and important intersections. It is interesting to note that even in 1789 there was an Old Road north of Accohick Creek.

This unusual detail led Colles to suggest that: "A traveller will here find so plain and circumstantial a description of the road, that whilst he has the draft with him it will be impossible for him to miss his way: he will have the satisfaction of knowing the names of many of the persons who reside on the road; if his horse should want a shoe, or his carriage be broke, he will by the bare inspection of the draft be able to determine whether he must go backward or forward to a blacksmith's shop. Persons who have houses or plantations on the road may in case they want to let, lease, or sell the same, advertise in the public newspapers that the place is marked in such a page of Colles' Survey . . ."

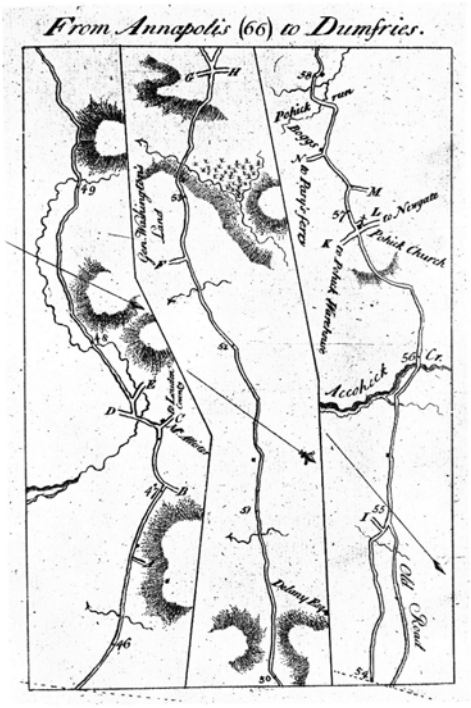

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Plate 66 of *A Survey of the Roads of the United States of America* (1789). The map covers about 12 miles of present Fairfax County, running northeastward from Pohick Creek.

Of the 83 plates, 23 cover roads in Virginia. Sixteen (Plates 65-79) show the route approximately along present-day US 1 from Alexandria, through Falmouth, and then to Hanover and New Kent Court Houses to Williamsburg and Yorktown. The remaining seven (Plates 81-86, 89) illustrate the route approximately along present-day Routes 301, 600, and 30 through Port Royal, Caroline Court House (Bowling Green), and Todds Bridge to Ruffin's Ferry (near the present Pamunkey Indian Reservation). The early nature of these maps is emphasized by the fact that on none of the plates is there even the slightest mention of Richmond or any road leading to it.

Despite a relatively poor response to his initial road survey, Colles continued with the mapping and his other engineering ventures. Major efforts included a Geographical Ledger and several canal projects in New York and New Jersey. In 1808 he proposed construction of an elevated timber canal across northern New Jersey. He sent his proposal to President Jefferson, who, declining to comment on the merits of the venture, observed that a more durable material might be used. As late as 1812, when Colles was 74, his agile mind continued to project large ideas, including the invention of a semaphoric telegraph. This and a number of his inventions were exhibited in New York in 1816, the year of his death.

One of his contemporaries described him as a "kind of living antithesis," who had "the most diminutive frame and the most gigantic conceptions, the humblest demeanor and the boldest projects." Despite his vision, none of his ambitious projects were successful. Of his lack of success, Colles often complained that had he been trained as a hatter, men probably would have come into the world minus heads. But many of his ideas arid projects long outlived this

visionary little man. Among these are the many road maps that remind us of the initial efforts of this revolutionary map maker.

Travels in Virginia During Revolutionary Times: Hopeless Seas of Mud With Archipelagoes of Stumps

Howard H. Newlon, Jr.

["Backsights" No. 29: originally published in the *Bulletin*, May/June 1976]

The millions of travelers who will visit Virginia as a part of their commemoration of our Nation's Bicentennial will have available to them convenient roads and bridges that will enable them to concentrate on the vagaries of travel itself. First time visitors will have signs and maps to direct them to their destinations with ease. Even unusual hazards such as fog-prone Afton Mountain will be minimized by extensive lighting and other safety features.

These travelers are the latest in a long line of visitors, for, during the eighteenth century, Virginia attracted numerous visitors who were interested in the sights of Yorktown and Williamsburg as well as the variety of life styles and their own romantic visions of the new nation. Unlike their twentieth-century counterparts, they found no signs and few bridges. Roads were often impassable, and hostelries often forced the weary travelers to share a bed with another traveler.

The descriptions left by travelers in journals were sometimes inconsistent. One traveler in 1746 found that the roads from Yorktown to Williamsburg and Hampton were "infinitely superior" to most roads in England, but this was probably not much of a compliment and roads in bad repair were much more common. In fact, when roads became impassable, the common practice was simply to change their directions. During the wet seasons, roads were described by one visitor as "hopeless seas of mud with archipelagoes of stumps." Typical were the problems confronting the Duke of La Rochefoucould-Liancourt who, traveling in eastern Virginia in 1796, wrote:

> Crowded in the stage by ten passengers and their baggage, we did not arrive at Richmond before 11 o'clock at night, though we had set out from Williamsburg at 8 in the morning; the rain, which has been abundant during the last two days, having rendered the roads very bad.

John Davis of Salisbury, who traveled in Northern Virginia in 1801-02, noted that "the roads are in general good through this State; and although the inns are sometimes bad yet upon the whole they are better than in the other states."

While opinions on road conditions varied, descriptions of stream fordings universally expressed the trauma of the experience. During May 1786 Count Castiglioni, who had landed in Boston a year earlier from Milan, set out northward from Staunton where he had spent several days because of heavy rains that prevented a visit southward to Natural Bridge. After spending the night at a house near the swollen Middle River he wrote:

> The morning of the 29th the good man of the house advised me that I might now cross. A crowd of people were at the bank to see us make the attempt. My servant stripped himself and ventured in (on horseback) with the carriage. He had hardly left the bank when the force of the stream swept him down and overturned the calesche. I called to him from where I was standing

> that his only hope was to let the horse go, and swim; he kept by the horse, and managed to save both it and himself. I resolved never again, in the matter of ferrying a swollen stream, to trust to the advice of these wild pioneers. The next morning I was able to cross, and at the North River was taken over in a flat canoe, the horses swimming at the side.

Count Castiglioni's trip must have left upon him a particularly poor impression of the new land, since two weeks prior to his harrowing experience at the Middle River he had written:

> I crossed the Blue Ridge by the road through Rockfish Gap, which is not comparable, either in steepness or in length, to the roads over the Apennies, much less those over the Alps. Thick fog, followed by rain, compelled me to spend the day at a house on the divide . . .

Imagine how the Count would marvel at the recently installed lighting system that guides today's traveler past the fogbound divide which prior to its installation had harassed travelers for more than two centuries.

Modern travelers find lodging and food at convenient intervals along their journey. The eighteenth-century traveler likewise required such accommodations. Scattered throughout the countryside were inns called "ordinaries." The name ordinary probably derived from the common or "ordinary" meal which was served at a fixed rate to all travelers.

The Marquis de Chastellux described a heavily frequented tidewater ordinary as:

> . . . a little house absolutely isolated in the midst of the woods . . . For lodging there is one large room for all the company. A pallet brought in and laid on the floor for each guest suffices for these country folk."

A wandering English lady described ordinaries as all resembling one another:

> . . . having a porch in front, the length of the house, almost covered with handbills . . . the profession of an inn keeper is far more respected in America than in England. . . There are always several beds in every room and strangers are obliged to sleep together. The sheets are mostly brown and seldom changed.

While the German scientist, Dr. Schoepf, in 1783 observed that "coffee, ham and eggs are commonly the sole entertainment," other activities, such as cockfights, were often provided and a cleared field nearby was commonly the site of quarter horse racing.

Ordinaries were commonly the primary source of the latest news, which was gathered from passing travelers. This practice led Dr. Schoepf to observe:

> We spent a night at a plantation, although no tavern is kept, the traveler is entertained for pay. There are disadvantages about this sort of inn, but on the one hand the proprietor escapes the payment of a liquor license and the trouble of catering to a crowd of idlers, and on the other hand the guest must answer only a few times the usual questions as to where he is going, where he came from, and what his business is.

Streams were major obstacles for early travelers. Conditions had not improved by the time of this mid-nineteenth century sketch titled "The Fording" by artist "Porte Crayon" [David Hunter Strother], which was published in his book *Virginia Illustrated* (1857).

The bad road conditions and the hazards of fording swollen streams notwithstanding, the most universal complaint of the eighteenth-century traveler was locating the proper road on which to travel. Almost all of the journals contain accounts of missed turns and long periods spent lost in the heavily wooded countryside. Some of this frustration is evidenced by Thomas Anburey, a young English lieutenant under General Burgoyne, who in 1779 wrote:

> If perchance you meet an inhabitant and enquire your way, his directions are, if possible, more perplexing than the roads themselves, for he tells you to keep the right-hand path, then you'll come to the fence of such a one's plantation; then keep that fence, and you'll come to a road that has three forks; keep the right-hand fork for about half a mile and then you'll come to a creek; after you cross that creek you must turn to the left and there you'll come to a tobacco house; after you have passed that you'll come to another road that forks; keep the right hand fork, and then you'll come to Mr. Such-a-One's ordinary, and he will direct you.

While most travelers concentrated on the eastern portion of the Commonwealth, Issac Weld of Dublin offers this graphic picture of the activities west of the Blue Ridge in 1796:

> As I passed along the road from Fincastle to the Potowmack, which is the high road from the Northern States to Kentucky, I met with great numbers of people from Kentucky and the new

> state of Tennessee going towards Philadelphia and Baltimore, and with many others going in a contrary direction "to explore" as they call it . . . These people all travel on horseback, with pistols or swords, and a large blanket folded up under their saddle. There are now houses scattered along nearly the whole way from Fincastle to Lexington, in Kentucky. It would be still dangerous for any person to venture singly; but if five or six travel together they are perfectly secure. Formerly travelers were always obliged to go forty or fifty in a party.

The twentieth-century traveler finds modern high speed highways and scenic hard surfaced roads where their eighteenth century counterparts found "hopeless seas of mud with archipelagoes of stumps." Modern bridges have superseded the dangerous fords. "Smokey Ordinary" now is merely the name of a crossroads in Brunswick County rather than the object of weary travelers seeking food and shelter. A current advertisement intended to attract Bicentennial visitors to Virginia promises "more history to the mile." Along these miles, unnoticed by most of these visitors, are old road traces and abandoned ordinaries, silent reminders of the heritage of which these travelers are a part.

"Sett over ye River By Chance"

Howard H. Newlon, Jr.

["Backsights" No. 30: originally published in the *Bulletin*, July/August 1976]

The early settlers in Tidewater Virginia found that the transportation needs of their predecessors, the Indians, had been served for generations by an abundant system of waterways. The settlers quickly began using these streams and rivers themselves, and their westward migration followed the shores of the waterways necessary for any commercial or social life. So long as the settlers were content to go in the direction of the waterways, these rivers and streams were welcome allies. But by 1630, significant settlements had developed away from the rivers and these villages dictated the crossing of the rivers, which then became formidable adversaries. Fording was at best inconvenient, and during periods of high water it became a harrowing and dangerous experience.

For those living in close proximity to the river, boats were a necessity. Thus, it was only natural that boat owners would furnish transportation across the river, first as an accommodation to friends and later as a commercial venture. Initially, regulations imposed upon the ferries emanated from the vestry and the county courts. While these small ferries were operated largely for convenience, the crossing of waterways, such as Hampton Roads, represented a challenging problem which received the attention of the General Court on June 30, 1640, when the following was recorded:

> Upon the petition of Henry Hawley for keeping a ferry at the mouth of Hampton roads in Kequotan for the use of inhabitants and passengers in or about their occasions, which the court taking into consideration the matter of tending to the great comfit of the inhabitants and others, have granted unto the said Hawley a patent for the same during his natural life, and the said patent to pass under the hand of the Governor and the seal of the Colony; the said Hawley, not exacting above one penny for the ferryage of any of the said inhabitants or passengers according to his offer in his said petition.

The nation's first road law, enacted by the Virginia General Assembly in 1632, made no mention of ferries. But by 1641, only one year afer granting Hawley's petition, the General Assembly recognized the need "for the more ease of travellers" by directing that "all this country respectively provide and maintain fferrys and bridges and the leavy for payment to the ferrymen to be made by the commissioners where the fferry is kept . . ." The law was enacted in January, with the directive that these "fferries, and bridges should be built and provided by the first of September following, And that all passengers whether strangers or others should be freed from payment otherwise than by the leavie, And that the fferrymen should give their due attendance from sunne rising to sunne setting."

[*Image in original:* Drawing of a ferry. *Caption:* A nineteenth-century drawing entitled "Waiting for the Ferry."]

This system of "free ferries" brought many protests from smaller planters upon whom the major tax burden fell. In 1647 the law was revised to establish set ferriage rates, but the ferries

remained under the jurisdiction of the county court. This arrangement continued for the remainder of the seventeenth century. That it was not always successful is reflected in a report dated July 13, 1696, by the Sheriff of Surry County to the council who had directed him to investigate the County's ferries. He reported that he had "given notice to all persons in the Conty, Pretending to keep fferrys." He listed three individuals, and continued "But theine answer was that they did not keep any fferry, But did sometimes sett over ye River By Chance some footmen, But no horse, and Their Demand is 2s-6d pr. head."

Such uncertainty apparently led the General Assembly to assume control of ferries, which they recognized in legislation passed in 1702 as "very useful for the dispatch of publick affaires and for the ease and benefitt of travellers and in business . . ." This legislation brought about fundamental changes in the regulation of ferries with the General Assembly replacing the County Court as the supervisory agency. The legislation directed "That ferryes be constantly kept at the places hereafter named, and that the rates for passing the said feryes, be as followeth . . ." The listing included 14 locations on the James below Varina in Henrico County, 14 on the York below West Point, and 6 on the Rappahannock below Tappahannock.

This legislation granted the power for licensing the ferries to the court of each county when the General Assembly was not in session. It recognized the important role of the ferrymen by granting to them certain privileges. These included freedom from "publick and county levys and from all other publick services such as musters, constables, clearing high wayes, being impressed and other things of like nature. . ." It also gave the court the power to license "such ferry keeper to keep ordinary without any fee either for the lycence or for obtaining the same notwithstanding there be otherwise a sufficient number of ordinaryes in the same county, and moreover that in such case no other person be admitted to keep ordinary within five miles of such ferry keeper . . . unless it shall so happen that the place of a county court or land laid out for a towne shall require it."

It further protected the ferry operator by requiring "That if any other person whatsoever for reward shall set any person or persons over any of the rivers whereon ferryes are appointed by this act except necessity of a parrish require it for going to church, he or they so offending shall forfeit and pay for every such offence five pounds current money of Virginia, one halfe thereof to be to the nearest ferryman to the place where such offence shall be committed, and the other halfe to the informer, and if the ferry keeper be the informer, then to have the whole to be recoverable. . ." This type of bounty system was often used by the Assembly to protect properly licensed public facilities.

The subsequent additions made to the list of required crossings reflected the expanding westward settlement. In 1720, rates for wheeled carriages and tobacco hogsheads were mentioned for the first time. Despite the requirement that ferries be operated at important locations on the major rivers, Hugh Jones in his *Present State of Virginia,* published in 1724, gave a vivid description of the inadequacies of the ferries.

Legislation passed in 1748 was similar in intent and language to that enacted in 1702, but the list of required crossings was just over 100 as compared with 34 in the earlier act. The list

included crossings of the James as far west as Scott's Landing in Albemarle and contained very detailed instructions concerning rates for wheeled vehicles.

The 1748 statutes were the first to set rates for cattle, pigs and sheep. Periodically, until the end of the Colonial period, legislation was passed establishing new ferry locations, abandoning others, and changing rates, but the system remained essentially as when it was initially established in 1702.

While the initial legislation and its subsequent modifications were essentially means for providing safe passage for travelers, they were in part military measures to provide "speedy transportation over rivers and creeks in time of danger." The legislation always included free passage for militia and other military personnel.

Gradually ferries were replaced by bridges as technology provided the expertise necessary to span the larger rivers. The twentieth century saw the replacement of Virginia's two longest ferry crossings of Hampton Roads and Chesapeake Bay by a combination of bridges and underwater tunnels. Today, the Department operates only four ferries. Three of these are free cable ferries. They are: the Hatton Ferry over the James River between Albemarle and Buckingham counties; the Merry Point Ferry over the Corrotoman River in Lancaster County; and the Sunnybank Ferry over the Wicomico River in Northumberland County. The fourth ferry runs between Jamestown and Scotland on the James River.

While today's crossings, like their mid-seventeenth century predecessors, are toll free, here the similarity stops. No longer are we "Sett over ye River By Chance." The vision and hope expressed by the 1702 General Assembly is realized for "the ease and benefitt of travellers, and in business . . ."

Roads to Independence: Routes of the Virginia Signers of the Declaration of Independence

Howard H. Newlon, Jr.

["Backsights" No. 31: originally published in the *Bulletin*, September/October 1976]

Those who converged on Philadelphia to commemorate our nation's bicentennial in July 1976 came with a spirit of gaiety, celebration and good fellowship seldom shown by large gatherings in this country in recent years. What a contrast between this bicentennial mood of those who stopped before Independence Hall and that of the makers of the Revolution, who two hundred years earlier were meeting inside the same building (then called the State House) to dedicate themselves to the preservation of liberty at the risk of execution for treason. Among those who later signed the Declaration of Independence were seven Virginians. Not only was their mental turmoil different from that of the twentieth century celebrants, but also the time and physical demands attending eighteenth century travel were vastly different from those of today. It is of interest then, in light of the current emphasis on the bicentennial celebration, to consider the actual roads used by these signers as they traveled the symbolic Road to Independence.

[*Image in original:* The signatures of George Wythe, Richard Henry Lee, Thomas Jefferson, Benjamin Harrison, Thomas Nelson Jr., Francis Lightfoot Lee, and Carter Braxton, from the Declaration of Independence. *No caption.*]

Artistic and dramatic representations have fixed in most minds an image of the creation and signing of the Declaration of Independence as a single event, or at least an event concentrated in a brief time span. This image does not coincide with the actual events, which took place over a period of years, during which time the delegates came and went. There is actually no general agreement as to how many were present on July 4, 1776, and the formal signing itself did not occur until August 2. Recently there has been speculation that all of the signatures on many of the surviving copies were signed by one person. Thus, some general background is helpful to appreciate the travels of the Virginians whose names appear on the landmark document of American independence.

During the 1770s discontent with their treatment by England caused the colonies to consider means for redress of their various grievances. In 1773, the Virginia General Assembly called for the creation in each colony of a committee of correspondence that would keep all colonists informed of any threats to liberty. The Boston Tea Party in 1774 brought the conflict between the colonists and England into sharpened focus. An expression of sympathy for the colonists in Massachusetts, adopted by the Virginia General Assembly, caused the Royal Governor, Lord Dunmore, to dissolve the Assembly. The dismissed burgesses met as private citizens at Raleigh Tavern and unanimously adopted resolutions that called upon all colonies to send delegates to a Continental Congress. A convention was held in Williamsburg in August 1774 to choose delegates to the Congress, which convened in Philadelphia on September 5, 1774. The Virginia delegation to this First Continental Congress, in order of their selection, were Peyton Randolph, Richard Henry Lee, George Washington, Patrick Henry, Edmund Pendleton, Richard Bland and Benjamin Harrison. The delegation reflected a broad spectrum of

views, from radicals—Henry and Lee—who advocated resistance, to the conservatives—Harrison and Pendleton—who hoped for conciliation.

Despite deep feelings over the injustices perpetrated upon the colonies by the British, many colonists and their delegates were reluctant to give up hope that the British government would come to its senses. The First Continental Congress, with Peyton Randolph as its president, deliberated for over a month without taking any major action. After adopting several memorials and addresses, the delegates left Philadelphia on October 26, 1774, providing for a second Congress to meet May 10, l775. The Virginia delegation to this second Congress was the same as that at the first, and Randolph was again, unanimously, chosen as president. On May 24, however, he deemed it necessary to return to Virginia to preside over a special session of the House of Burgesses, and his place as a delegate was assumed by Thomas Jefferson. John Hancock was elected to replace him as president. Thus Randolph's departure brought two of the names most prominently associated with the Declaration of Independence into the unique place in history with which they would subsequently be associated.

During this Congress, George Washington was unanimously elected to command the Continental Army, a continental postal system was established, and the groundwork for the defense of the colonies was laid. The Congress generally met as a whole from 8 A.M. to 5 P.M., with committee meetings in the evenings. Washington entreated them to move their deliberations closer to Boston, where his struggling army was torn by "discord and confusion," or at least to send a committee with which he could take counsel. Congress did neither. The Virginia delegation remained, some dividing their time between the deliberations in Philadelphia and their duties in the House of Burgesses in Williamsburg. In June, the royal government in Virginia collapsed, and the colony from that time was, in effect, "governed by committee" under the Virginia Convention.

On August 11, 1775, the Virginia Convention met to replace Washington. Henry, who had become colonel of the First Virginia Regiment, and Pendleton, who was in poor health, asked to be excused from service. The convention elected seven delegates, in order of votes, as follows: Peyton Randolph (89), Richard Henry Lee (88), Thomas Jefferson (85), Benjamin Harrison (83), Thomas Nelson, Jr. (66), Richard Bland (61), and George Wythe (58). Bland declined to serve because of age and infirm health and was replaced by Francis Lightfoot Lee. These seven later returned to Philadelphia, but the illness that was to cause Randolph's death in October 1776 forced his resignation, and Carter Braxton was elected in December 1775 to replace him. Thus it was that the awesome responsibility for declaring independence from England was laid upon these seven Virginians.

Harrison and Wythe, who were both 50, were the oldest, while Jefferson, at 33, and Nelson, at 38, were the youngest. Braxton and the two Lees were in their early 40s.

Unfortunately, the members of the Virginia delegation were not disposed to journals or diaries as were men like John Adams, who recorded details of his travels between Boston and Philadelphia as well as his impressions of his fellow congressmen. Thus reconstruction of the travels from Virginia to Philadelphia for the most part must be extrapolated from indirect

evidence, knowledge of the roads of the period, and incidental references in letters and other documents.

Jefferson's account is of special interest because of its detail and since it probably reflects the travel experiences of the others, although the roads and locations would obviously be different. His several trips also emphasize the fact that the Congress was by no means a static gathering as it extended over almost two years. Jefferson's first trip to Philadelphia began from Williamsburg and proceeded through Fredericksburg and Alexandria. By the time he reached Philadelphia 10 days later, he had acquired four horses. Six weeks later, on August 1, Congress recessed, and he headed south to Richmond to attend the Virginia Convention. On September 26, 1775, he set out from Monticello for Philadelphia where he remained until the end of December, when he returned to Monticello. Because each state had only one vote, regardless of its number of delegates, Jefferson left content that his absence would not compromise Virginia's representation. He had planned to return to Philadelphia in the spring of 1776, but the death of his mother and his own illness delayed his return until May 7. He then remained in Philadelphia until September, following approval of the Declaration.

As reflected in his account books, Jefferson's trips from Monticello followed what he referred to as the "upland" route through Orange, Culpeper, Fauquier Court House, and Leesburg. His entry for May 7 states: "Left with Mrs. Jefferson at 10. Set out for Philadelphia." The books show that on May 8 he paid for breakfast at Orange Court House and there were similar entries for breakfast without lodging for subsequent days at Culpeper and Fauquier Court House. The exact route between Monticello and Culpeper is uncertain, but a visitor to Monticello in 1808 records that his trip from there to Alexandria went through Orange and "from the latter place I took the private or middle road, it being recommended to me by the President, in preference to either of the other public roads, one of which goes by Fredericksburgh, and the other by Culpepper Court-house, this last is his winter route to and from the city; but the road I travelled is the best and coolest for a summer journey."

Between Orange and Culpeper, and again at Fauquier Court House, he paid "a smith on the road - 7d.1/2." On May 9 he paid for "dinner at Redhouse." (The Red House was later, in 1799, to be the site of the town of Haymarket at the intersection of current Routes 15 and 55.) That night he lodged and ate supper in Lacy's (also called West's) Ordinary, at what in 1810 became Aldie. On the 10th he ate breakfast at Mclntire's in Leesburg, and paid ferriage at Knowland's on the Potomac. This ferry, operated by Thomas Noland, had been in operation since the 1750s. It was located on an extension of current Route 660 in Loudoun, northeast of the village of Lucketts. He paid 3/9 for ferriage and gave the ferryman 7d.3/4. In his subsequent ferry crossings, he paid a ferriage charge and gave the ferryman a gratuity in proportion to the cost.

This route through Loudoun followed the "Carolina Road," which was also often called "Rogue's Road," because the General Assembly was constantly called upon to deal with problems from horse and cattle thieves and a local Robin Hood called Captain Harper.

Interestingly, Jefferson's accounts are recorded as being in "Virginia Currency," "Maryland Currency," etc., which reminds us that travel in colonial times was very much like

today's international travel in which the traveler must deal with exchange rates reflecting differences of currency values. Jefferson's biographer, Dumas Malone, observes that the exchange rate was usually favorable to Virginia currency.

Once across the Potomac, Jefferson's itinerary took him through Fredericktown, Maryland; York, Lancaster and Chester, Pennsylvania; and, via ferry, over the Schuylkill to his arrival in Philadelphia on May 14, one week after he left Monticello. Malone indicates that he was accompanied by his servant, Bob. Along the way he paid several barbers, apparently for shaving, saddlers and smiths for minor repairs to livery and for horseshoes. In Black Horse, he purchased some "cyder." For certain nights, lodging and meals are unaccounted for, and presumably he stayed or ate with friends along the way. In his accounts, it was normal to find supper and lodging at the same place but breakfast on the next day a considerable distance away. Apparently, he started early and rode for several hours before breakfast.

In September, Jefferson returned by the same routes, stopping again at McIntire's in Leesburg, Tyler's at Red House, and Porter's in Orange. There is no mention of the bills of fare, but in December 1783, a European traveler was much taken with a "fat eel of 5-6 pounds weight" that he consumed at Nowles (Noland's) Ferry. The return trip occurred between September 3-9. Malone indicates that he traveled by phaeton, a light, open vehicle.

While they are not related to his travel, it is interesting to observe Jefferson's expenditures for July 4, 1776, a day when one would think that his attention was consumed by the tumultuous events occurring at the State House. The page contains three entries:

> Pd. Sparhawk for a thermometer £3-15
> pd for 7 pr. women's gloves 27/
> gave in charity 1/6

Even on this climactic day, his continuing interest in science, his family, and the unfortunate is apparent.

No other accounts provide anything to permit a detailed reconstruction of the travels of the remaining signers. An item in the *Virginia Gazette* for September 1, 1775, stated: "Since our last, the hon. Peyton Randolph, esq.; Col. Thomas Nelson, and George Wythe, esq; set out for Philadelphia, to attend the General Congress on the 5th of this Instant, accompanied by their several ladies." Nelson later wrote Jefferson to bring Mrs. Jefferson, but she was too ill to travel the great distance.

They undoubtedly traveled the present "Washington-Rochambeau" route from Williamsburg through New Kent to Hanover Court House, and thence via Bowling Green and Fredericksburg to Alexandria, where they forded the Potomac and continued through Maryland to Philadelphia. An account filed with the state by William Cocke in 1789 to cover his transport of a wagon load of books between Richmond and New York lists ferry charges at Fredericksburg, Colchester, George Town, Elkridge Landing {Maryland), Susquehanah and Schylkill. Most of the Virginia signers probably used the same route.

From the diaries of George Washington, it appears that he left Mount Vernon by carriage on May 4, 1775, probably accompanied by Richard Henry Lee. They met several other delegates along the way between Mount Vernon and Baltimore because he, Lee, Peyton Randolph, Edmund Pendleton and Benjamin Harrison, along with delegates from North Carolina, all arrived in Baltimore on the same day.

Some appreciation of the trip through Maryland can be gained from an account by Ebenezer Hazard, who complained in 1777 that he passed through 32 gates in one day on his way from Baltimore to Marlboro. Apparently the colonial roads in Maryland ran through plantations and farms without any rights-of-way, with gates separating the various properties. No wonder a "gate boy" was an essential element for early travelers.

According to Christopher Marshall, the arrival in Philadelphia of the delegates from Virginia and other southern colonies was celebrated by a large reception and parade at the outskirts of the city. No account by the Southern participants survives, but John Adams describes a similar greeting for delegations from New England.

On the night of July 4, 1776, the delegates reached the end of their symbolic journey and crossed the river of no return. Malone, in describing Jefferson's first trip to Philadelphia, says that when he ferried across the Potomac on his way to the Continental Congress, "he crossed his Rubicon." His trip was to radically change the course of American history. Radical changes are also evident in the way we, with comfort and speed, are able to travel to Philadelphia to commemorate the beginning of our nation at the place to which these "Roads to Independence" led.

A Royal Inspection

Howard H. Newlon, Jr., and Nathaniel Mason Pawlett

["Backsights" No. 32: originally published in the *Bulletin*, September/October 1976]

In July 1976, Charlottesville and Albemarle County were singularly honored by visits from President Gerald Ford and Her Majesty Queen Elizabeth II. On July 5, President Ford, along with other dignitaries, officiated at the naturalization ceremony held annually at Monticello. The visit of Her Majesty Queen Elizabeth on July 10 was a part of her bicentennial visit to the United States. The Queen had included Charlottesville and Albemarle because, in her own words, "from this state have come many of the great men of the United States. Your first President, George Washington, my kinsman; Presidents Monroe and Madison; and the man who built this university, Thomas Jefferson, the intellectual driving force behind your revolution."

The visit of Her Majesty was certainly a highlight of the state's bicentennial observance, and the thousands who lined her route and heard her remarks at the University were charmed by her warmth, even amidst the formality of the occasion. It is of some interest to the Department that her tour route between the University and Monticello took her through the construction project to widen Preston Avenue. Even though unofficial, this is perhaps the only time that one of our projects has received "a royal inspection" from a reigning English monarch.

[*Image in original:* Queen Elizabeth greeting spectators. *Caption:* Queen Elizabeth II greets spectators on her visit to Charlottesville.]

[*Image in original:* Governor Mills Godwin greeting spectators. *Caption:* Governor Godwin chats with Anne Bushman and her daughter Martha at the festivities. Mrs. Bushman is the wife of W. H. Bushman, secondary roads engineer in the Central Office.]

[*Image in original:* The limousine carrying Governor Godwin and Queen Elizabeth II passing through the road widening project on Preston Avenue in Charlottesville. *Caption:* Limousine carrying Governor Godwin and Queen Elizabeth II through the widening project on Preston Avenue in Charlottesville.]

Naturally the impending visits of two heads of state was the generator of intensive preparations and planning. For the Queen's stay, each activity was scheduled to the minute and security measures were extensive. The Department was given the responsibility for coordinating arrangements for the foreign domestic press corps and the Research Council handled their transportation. Arrangements included attention to even the smallest detail. As noted in the local press, considerable ingenuity was needed to overcome the fact that during the Queen's lunch in the newly restored Rotunda, the sun coming through the skylight created an unacceptable glare. Initial attempts to cover the skylight with a parachute were unsuccessful, but finally the glare was eliminated by covering the glass with brown wrapping paper.

An article appearing in the Summer issue of *This England* reminds us that the "more things change, the more they remain the same." The article describes the preparations for the summer holidays of Queen Elizabeth I, the current monarch's namesake. The article notes that once the Queen expressed an interest in visiting an area, the preliminary routes and dates would be suggested. "Home owners, local sheriffs and town officials would be notified and requested to suggest possible lodgings." According to the article, "Later, officials were sent out to inspect the lodging and the royal 'waymaker' followed to survey the roads and set repairs in train . . . In the case of towns, the resulting preparations brought some benefits. Streets were repaired, perhaps broadened, and freshly graveled. House fronts were cleaned and painted and the dunghills in the yards removed. Stages were set up, entertainments prepared, speeches written and a present for the Queen was bought." These preparations closely paralleled those for the Queen's recent visit. Modern technology has eliminated the front yard dunghills, but it is interesting to note that all outdoor billboards were removed along her route.

Then as now, everyone turned out in their "Sunday best." The Sheriff of Suffolk in 1578 was particularly successful because his efforts led to "200 young gentlemen cladd all in white velvet and 300 of the graver sort apparelled in black velvet coats and fair chains." These along with 1,500 serving men greeted the Queen on horseback in what was described as "A comely sight."

Owners of houses where she was to stay, rich or not so rich, had the same problems. How to transform their homes into miniature courts? In what rooms should they put the Queen and her household? Where would they find enough food? What sort of diversions should they provide? Could they ensure the hunting beloved by the Queen? What present should they give? She always returned to London loaded with jewels, articles of clothing, cups, purses of money and so on.

The Queen being the source of honor and distinction, many of the nobility extended invitations to stay with them at their seats as she made her progress through the country. This meant, of course, not just Her Majesty, but all her retainers, guards, servants, lords and ladies-in-waiting, amounting to several hundred people. The host nobleman housed and fed the Queen as well as all of these people, so that a considerable expenditure was involved. In at least one case, that of a 13-day visit by Elizabeth I about 1600 to Basing House, the seat of the Marquis of Winchester, the expenses were so heavy that the son of the Marquis did not manage to clear the estate of debt until 1642.

Dozens of requisitioned carts had traveled ahead, carrying the baggage, the royal bed and bedding, wall hangings, clothes, all sorts of household goods, and tents to be used for picnics or to accommodate those members of the household for whom quarters could not be found.

Modern day Americans are prone to question the need for such pomp and ceremony, but those who witnessed the efficiency and dignity of the Queen's visit had to admit that it was truly, in modern parlance, "a happening" that was a fitting climax to our nation's birthday celebration.

" . . . Blased and Laid off with Two Knotches and a Cross . . .": The Genesis of the Valley Road

Nathaniel Mason Pawlett

["Backsights" No. 33: originally published in the Bulletin, November/December 1976]

On December 19, 1742, at Balcony Falls, near the present town of Glasgow, there occurred a clash between a group of traveling Iroquois Indians and some Virginia militia. This incident might have become the cause of the French and Indian War had not the differences been resolved by the Treaty of Lancaster in 1744. By the Treaty of Albany in 1722, the Indians had agreed to abandon their path east of the Blue Ridge in favour of one in the Valley for their annual travels. In the following years, as more white men came to the Valley, the game upon which the Indians depended for food gradually disappeared and they began to prey upon the homes and livestock of the settlers in order to subsist. This led, finally, to the clash at Balcony Falls.

Well aware of the French presence in the Ohio Valley, William Gooch, the Royal Lieutenant Governor at Williamsburg, understood the international implications of the battle when he received a letter from Colonel James Patton, commander of the Augusta County Militia. Patton, a former Irish sea captain turned land speculator who would prove instrumental in the settlement of the Valley, had become influential in the few years he had been on the Augusta County frontier. Now, Patton detailed to Gooch the incident at Balcony Falls, noting the presence of a white man, thought to be French, among the Indians. Meeting with the council on December 31, Gooch ordered medicine and a supply of arms and ammunition sent to Patton and then ordered the militia of Orange and Fairfax counties to be ready to aid Augusta. Augusta, a frontier county created from Orange in 1738 and extending from the Blue Ridge to the Mississippi River, was then still being administered by the Orange County court.

After taking these initial measures, Gooch communicated with Lieutenant Governor Clarke of New York, enclosing copies of Patton's letters. Clarke, having the Iroquois under his jurisdiction, shortly set afoot inquiries, determining that the alleged Frenchmen in the party were only "mongrel Indians" and that the Indians accused the Virginians of being the actual aggressors. Meanwhile, Gooch had received queries about the incident from Governor Thomas of Pennsylvania. Shortly, all of these people, as well as their Indian commissioners and interpreters, were busily engaged in attempting to pacify the Iroquois, who continued to complain of their ill treatment by the Virginians while explaining that the so-called Frenchman was only a blue-eyed "young fellow half-Indian and Half-Christian."

By August 1743, the Indians seemed temporarily placated. Gooch had invited them to meet with commissioners from Virginia and had sent them a present of £ 100. During the winter of 1743, Virginia, Maryland, and Pennsylvania made plans to meet with the Indians at Lancaster, Pennsylvania. In June 1744, the meeting finally occurred and the Indians' grievances were aired. Besides the preservation of peace, the governors were interested in the Indians' lands, and it was probably no coincidence that the land speculator, Colonel James Patton, was on hand. The canny Gooch, however, fearing the effect on the Indians of having to negotiate with their claimed oppressors, had appointed as Commissioners to conduct negotiations two prominent members of the Tidewater gentry, Thomas Lee and William Beverley. Although the owner of 118,000 acres near Staunton, Beverley had not been connected to the Balcony Falls affair by the Indians.

Although Patton was not active in the negotiations, his signature appears at the head of the English signatories to the treaty. Land was being ceded by the Indians, and Patton was very much interested in western lands. In return the Indians received mostly cheap trade goods. On one issue, however, they were adamant: they must have a good road southward through the Valley and a safe passage over it for themselves. This they were going to get; in fact, this road, which came to be called "the Indian Road" in early records, was the only substantive thing they received as a result of the Treaty of Lancaster.

At this time a way called the "Great Road" already existed, running from Pennsylvania by Fredericktown (Winchester) as far south as Beverley's Mill Place (later Augusta Court House and Staunton). This route had been used by the early settlers of the Valley, and it was doubtless along this road that James Patton returned from the Treaty of Lancaster. Near Staunton, another road which ran to Richmond and would shortly be called the Three Notch'd Road east of the mountains, joined the Great Road, providing a link with the colonial government at Williamsburg. South of Staunton, or Beverley's Mill Place, leading toward Benjamin Borden's patent, was "Borden's Path," a packhorse way opened by Borden's agent, John McDowell, to allow settlement of this vast tract.

By the terms of the treaty, James Patton was directed to extend this road from Frederick County to the southwest for the benefit of the Indians. Hardly a disinterested party to all this, Patton was shortly to receive 100,000 acres of land on Woods or New River, which had already been surveyed under his direction. This road would prove beneficial to his interests there. The winter after his return Patton must have been a very busy man for he thoroughly examined the country through which the road would run. By the next spring he had evidently mapped the route.

On March 30, 1745, the Orange County Court (still administering Augusta) issued an order for James Patton and John Buchanan to view the way from the Frederick County line through "that Part of the County Called Augusta." That Patton must have previously thoroughly reconnoitered the road is manifest from the fact that slightly more than a week later, on April 8, 1745, their report stated that the road had been viewed as far as Adam Harmon's on New River (near the present Blacksburg) and "Blazed and laid of[f] with Two Notches and a Cross." On May 24, the Court directed that the road be cleared and direction posts erected along this marked route running from Tom's Brook, skirting Beverley's Mill Place (Staunton), to Gilbert Campbell's Ford (Lexington) on the north branch of James River. From there it was to cross the James at Cherry Tree Bottom (Buchanan), where Patton rather conveniently owned the ferry, and run to Harmon's on New River. The road was to be divided into sections with individual overseers and their gangs of tithables.

The Indian Road was probably the longest continuous road ever laid out at one time in colonial Virginia, being approximately 175 miles long. Certainly the order for it, occupying a page and a half in the Orange County Order Book 1743-1746, is the longest, most detailed one discovered to date. Soon, however, the Indian Road was to be extended into Tennessee and Kentucky by Daniel Boone as the Wilderness Road. Near Big Lick (Roanoke) another road branched southward, crossed the Blue Ridge into the then westernmost part of Lunenburg County, passed near the present site of Martinsville, and continued into North Carolina. This route became known as the Carolina Road.

Over the Indian Road and these two extensions later poured the streams of migrants who populated much of the upcountry Carolinas and Georgia as well as the new West, so soon to open

after the successful conclusion of the American War of Independence. In the next century the Indian Road would be improved, straightened and, paved, become the Valley Pike, and resound to the marching feet of Stonewall Jackson's ragged legions. Surviving well into the twentieth century as one of Virginia's few operational turnpikes, it was taken over by the state in 1918, ultimately becoming Route 11.

Rebuilt as Interstate 81, James Patton's Indian Road is today a modern artery of commerce, used by tourists and truckers instead of Indians and land speculators. At Christiansburg, it runs within a few miles of where Patton lies buried, a victim of the Draper's Meadow Massacre of 1755. Of the thousands who each year ride these twin ribbons of concrete and asphalt, few have ever heard of the Irish sea captain turned land speculator and Virginia gentleman, James Patton. Such are the usages of time.

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"And the Highwayman Came Riding": Joseph Hare and the Spectral Horse

Nathaniel Mason Pawlett

["Backsights" No. 34: originally published in the *Bulletin*, January/February 1977]

To most Virginians, this line from Alfred Noyes's poem, "The Highwayman," evokes images either of a romantic eighteenth century figure, like England's Dick Turpin, or of one of our own desperadoes, like Jesse James or Black Bart. Few know that there were "gentlemen of the road" operating in Virginia from a very early period. In the eighteenth century, there is mention of a Captain Harper, operating in the area of the Bull Run Mountains and was reputedly a Robin Hood, robbing from the rich and giving to the poor. The existence of Rogues Road and Newgate Road in that area proves that these tales are more than apocryphal. The most interesting documented incident involved a noted highwayman and a spectral intervenor on the side of law and order.

Below the Staunton River, in the western part of Southside Virginia bordering on the majestic Blue Ridge, lies Franklin County. Most of the southeastern part of the county lies between two parallel ridges, Chestnut Mountain and Turkeycock Mountain, which run in a southwesterly direction from a point near the Staunton River towards North Carolina. In 1806 there rode into this bucolic paradise of small farms interspersed with large tobacco plantations a young man already launched on a criminal career which would ultimately lead him to the gallows.

Joseph Thompson Hare was born of a good family in Chester County, Pennsylvania, in 1780. A troublesome child, he seemed predestined from birth for a life of crime. When he was 16, he robbed a neighbor a mile or two distant from his father's home, and his father disowned him. Young Hare then made his way to Philadelphia.

From there, Hare went to New Orleans. At that time, this city had a city patrol, or police force, called the Governor's Guard, and Hare promptly enlisted. In his new position, with its enlarged opportunities, he continued his career in crime. While ostensibly guarding the residents of New Orleans from the thieves and cutthroats with which the city teemed, in reality he joined them in their dirty work. Following a particularly successful robbery in which he relieved a rich Cuban of five thousand dollars, Hare traveled to Knoxville, Tennessee, with the intention of returning to his old home. It is interesting to speculate whether Hare took the Natchez trace, a road noted for its lawless element and their many crimes. If he did, it is likely that he added substantially to the loot he had taken from the Cuban. Certainly Hare was never one to let an opportunity for skulduggery pass neglected.

Leaving Knoxville, he made his way toward Richmond on horseback. At Abingdon, he fell in with Robert Bumpass, who was returning to his former home in Franklin County, and the two men set out together. By the time they reached Franklin County, Bumpass evidently felt secure enough with Hare to brag about the profits of his trip and the "450 Spanish milled dollars" he was carrying home with him. Hare had been contemplating robbing him for several days, but

had held off. This boast ended his indecision, and on the mountain between Snow Creek and Turkeycock Creek, he proceeded to rob Bumpass of his money, his horse and his clothing.

Once he was away from Bumpass, Hare released the horse and fled. As night fell, Hare, the hardened criminal, was for some reason seized by a fear he could not rationalize. Fleeing through the forest in panic, he was brought up short by a white horse standing in the road directly in front of him. This spectre nearly unhorsed him when his steed came upon it. No application of the spur and whip would suffice to move his horse past the apparition, and after several attempts to pass, Hare turned back.

Hare spent the night at a house down the road, and the next morning he was arrested and taken to the jail. He was tried and convicted in April 1807 and sentenced to eight years in "the penitentiary house."

Hare, who has been called "the first noted highwayman that America produced," served his time, was released, and took up the trade of harness-making. His good intentions were soon overpowered, however, by his criminal proclivities and he "took to the road again," committing robberies in many states. Captured again, he was sentenced to five years in the New Jersey penitentiary, but served only part of the sentence. Finally, in 1817, he combined his talents with those of his brother, Lewis Hare, also a robber, and another criminal named Alexander. They robbed the mail coach at Havre de Grace, Maryland, and were captured and hanged on September 10, 1818.

[*Image in original:* Print showing an English highwayman (adapted from "Mull Sack robbing the Oxford Wagon," an engraving from Captain Charles Johnson's *A General History of the Lives and Adventures of the Most Famous Highwaymen, Murderers, Street Robbers, &c*., 1734). *Caption:* An English "gentleman of the road" plying his trade.]

[*Image in original:* Detail of the 1859 map of Franklin County. *Caption:* Southeastern Franklin County as shown on the 1859 edition of the Nine-Sheet Map of 1826.]

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Troubled Bridges Over Waters

Howard H. Newlon, Jr.

["Backsights" No. 35: originally published in the *Bulletin*, March/April 1977]

Bridges have always held a particular fascination, not only for the technologists who design and build them, but also for the laymen who use them, and the poets who write about them. Unfortunately, they are also intriguing to those who for various reasons would destroy them, as exemplified by the recent senseless burning of the Meems Bottom Covered Bridge by vandals. In addition to fire, other enemies of bridges, floods and progress, have removed and will continue to remove from the countryside these examples of man's ingenuity and his efforts to span the numerous rivers and creeks that were once impediments to his land travel.

The oldest metal bridges in Virginia, dating from the late 1870s, testify to the great statewide floods of that period. The first was the great flood of 1870, followed by a similarly destructive flood that occurred in November 1877. These two floods were the worst since 1771 and remained the worst such disasters until those accompanying Hurricanes Camille and Agnes in 1969 and 1972. The two nineteenth-century floods wrought havoc on the state's numerous wooden bridges which had either survived or been rebuilt following the earlier widespread destruction during the Civil War. Most of the bridges destroyed by the floods of 1870 and 1877 were replaced by the then rapidly developing and generally available metal trusses.

Accounts in the *Richmond Daily Whig* in November 1877 filled most of the front page with descriptions such as "appalling destruction in Lynchburg, Danville and elsewhere," and "Dan River very high . . . swept away houses and bridges . . . gas-works submerged . . . city in darkness." A bulletin, datelined Lynchburg, reported "bridges and everything swept away." An earlier report from Lynchburg had warned Richmond "the river is now as high as it was in 1870 and still rising. Look out!"

Earlier destructive floods recorded by turnpike authorities include the "great freshet" of July 1842 which was noted as being the worst since 1795. This flood seems to have been concentrated between Lexington and Covington. The Jackson's River Turnpike was reported "impassable, and every bridge swept away." In September 1843 the Warm Spring and Harrisonburg Turnpike Company reported that "the very extraordinary freshet . . . swept away two of our most important bridges." These were north and east of Lexington. The records of the Board of Public Works include numerous other reports of bridge destruction by local floods.

The disastrous and widespread floods of the 1870s followed closely on the heels of what was probably for bridges the most destructive period in the history of the Commonwealth, the Civil War. The expression "burning their bridges behind them" aptly describes this period, but bridges were often burned "before them" as well. The bridges of the B&O Railroad were especially susceptible, and by the end of 1861 all but one of its bridges between Cumberland, in Western Maryland, and Berlin (on Maryland's eastern shore) had been destroyed. Indignant Northern newspapers ran cartoons to the effect that "Union builds bridges" while "Secession

destroys them." In retaliation the Union mounted its own program of bridge destruction. By November 1862 Herman Haupt, who was in charge of the U.S. Military Railroads, and had written in 1851 one of the first U.S. textbooks on bridge design and construction, had prepared a manual which provided instructions for demolition of bridges within a five minute period.

[*Image in original:* Photograph of Herman Haupt. *Caption:* In addition to writing one of the first U.S. textbooks on bridge design and construction, Herman Haupt also wrote a manual on bridge demolition.]

There is no inventory of the number of bridges destroyed during the war but it would number in the hundreds, and several were burned, rebuilt and subsequently burned again. John Wayland, the eminent historian of the Valley, states that "most of the bridges in the Valley were burned between 1861 and 1865." He describes burnings of bridges at Port Republic, Timberville, Bridgewater, and Mount Jackson.

[*Image in original:* Print from *Harper's Weekly* showing the destruction of the bridge at Harper's Ferry in June 1861. *Caption:* The destruction of the bridge at Harper's Ferry during the Civil War.]

Not all wartime bridge burnings went according to plan. In a communication to Jefferson Davis in 1864, Lee reported that "during the night from causes unknown to me General Gleary burned the Meadow Bridge" which was north of Richmond. Lee went on to indicate that he had issued instructions for the bridge to be reestablished as soon as possible since he had planned to move troops across it when he found that it had been burned. Lee's biographer, Douglas S. Freeman, indicates that "Gleary" was an error in transmission: the man to whom Lee referred has never been identified. It is probable that the person who ordered the destruction was happy that his anonymity was preserved.

Bridge burnings were not always the result of war. One that would qualify as a violent reaction to "progress" is found within the reports of the Board of Public Works. In 1825 Colonel Claude Crozet, Virginia's principal engineer, completed a detailed inspection of the Kanawha Turnpike. He was impressed with the quality of the bridges, particularly the one over the Greenbrier River, which he described as "one of the most splendid wooden bridges ever built." It consisted of two spans of 211 feet each, with stone abutments and a stone pier. Crozet was highly complimentary of its builder, James Moore, and stated that he knew of only three instances where the span had been exceeded, noting that the span exceeded by 16 feet that of the famous Schuylkill bridge of Philadelphia.

[*Image in original:* Print showing James Moore. *Caption:* Bridge designer James Moore built a bridge over the Greenbrier River that was praised as "one of the most splendid wooden bridges ever built."]

Crozet also reported that a slightly less impressive feat of Mr. Moore's was his Gauley River Bridge constructed of three arches of 160 feet each. Crozet remarked, "This handsome monument of human skill and enterprise, at the confluence of two streams, and in the midst of remarkably wild scenery, looks exceedingly beautiful." Unfortunately, the operators of the ferry

that this bridge replaced did not share Crozet's enthusiasm for the structure and on the night of July 11, 1826, the structure was completely destroyed by fire generally believed to be their handiwork. The bridge was replaced by an open rather than covered superstructure to minimize the loss in event of a repeated attack.

As bridge building technology progressed, the builders, who in many cases were also the designers, attempted longer and more daring spans. Sometimes their reach exceeded their grasp. One example was a bridge across the Staunton River owned by the Lynchburg and Pittsylvania Turnpike Company. This bridge, more than 500 feet long and supported by four piers, had one 126-foot span that, according to Crozet, was "somewhat depressed in the middle." This bridge was a lattice truss made popular by its inventor Ithiel Town. He not only was a good bridge builder but also a shrewd businessman, extracting a $1-per-foot royalty from all who used his lattice design.

Despite the massive destruction caused by fires and floods, the greatest destroyer of bridges has been the demands of progress accompanying the need for increased load and traffic capacity. The first half of the twentieth century saw the removal of most of Virginia's covered wooden bridges. A notable survivor is the Humpback Bridge built west of Covington in 1857 that stood derelict from 1929 until its dedication as a wayside in 1954.

Within recent years progress has removed several significant structures. One, the oldest surviving metal bridge in Virginia, was an arch truss built by the King Iron and Bridge Company after the flood of 1877 in Bedford County. It originally spanned Stony Fork Creek south of Bedford but was later moved at least twice before reaching its final location on Route 637 over Little Otter River. This bridge has been saved and will be incorporated in a wayside on Route 81 in Montgomery County as a pedestrian bridge.

The oldest metal truss bridge retaining its date plate and surviving at its original location was also removed in 1976. It was built at Fauquier Springs in 1879, also by the King Iron and Bridge Company. It was removed intact pending local efforts to preserve it. To date these efforts have not proven fruitful. Hopefully, this bridge will also be saved. Another significant bridge, although much newer, was lost in 1976 during the realignment of Route 156 over the Chickahominy River between Hanover and Henrico. This bridge, a concrete arch span, was built in 1908, two years after the creation of the State Highway Commission. Known locally as the Grapevine Bridge, this was an excellent and very sophisticated example of early concrete bridge design. Unfortunately, efforts to retain this bridge also floundered for lack of local interest.

Efforts by the Research Council have been directed toward inventorying the older structures with a view toward identifying those bridges which are worthy of special attention because of their historic significance. Fires and floods are beyond our control but hopefully criteria can be developed which will ease the trouble generated by the conflicting demands of progress and preservation.

[NOTE: In addition to the initial study of early metal truss bridges undertaken in the 1970s, the Virginia Highway and Transportation Research Council, later the Virginia Transportation Research Council (now the Virginia Center for Transportation Innovation and

Research), subsequently completed studies of various types of bridges in Virginia, including concrete and masonry arch bridges, early non-arched concrete bridges, movable span bridges, covered bridges, an update of the original metal truss bridge survey, and a management plan for Virginia's historic bridges.]

A Century and a Half of Transportation Planning

Howard H. Newlon, Jr.

["Backsights" No. 36: originally published in the *Bulletin*, May/June 1977]

In meeting their broadened responsibility for coordinating a variety of transportation modes, agencies throughout the country have directed their efforts to developing statewide or regional transportation plans. The goal of these plans is to utilize and to integrate the already established systems and supplement them appropriately.

The problem faced by modern transportation planners had a close parallel in the initial efforts when Virginia established the first statewide transportation department, the Board of Public Works, in 1816.

The Board was created to administer the fund for internal improvements "exclusively for the purpose of rendering navigable the principal rivers and of more intimately connecting by public highways, the eastern and western waters of the state." At that time there was in the eastern portion of the Commonwealth a number of roads and a few canals that had for the most part been developed under local control and planning, predominantly with private funds. Such roads as there were to the west had been financed by the General Assembly, because the sparsely populated western areas did not offer a sufficient economic base for such development.

Still, there was great interest both locally and nationwide for viable connections because the merchants in eastern Virginia, like those along the Atlantic seaboard, feared that trade from the Valley of Virginia would be diverted northward to Philadelphia via the Great Waggon Road or to New Orleans via the Ohio River system and the Mississippi.

A revision of the general road law in 1785 had as a primary goal a greater unity of action throughout the state, and followed closely the enactment by the Assembly in 1782 of a statute directing a general survey of roads through the Blue Ridge and the several port towns. It was intended that this survey be done by the localities through private funding. Unfortunately, this initial attempt to establish an inventory that might have formed the basis for a systematic plan was completely ignored by the localities.

The period between the end of the Revolution in 1781 and the second war with England in 1812 was one of great ferment nationally and locally, and saw various unsuccessful attempts to initiate a federal transportation program. In these efforts state interests prevailed so that the planning and projects were conducted by the state. A notable exception was the authorization in 1806 of the Cumberland Road from Cumberland, Maryland, to Ohio.

The creation of the Board of Public Works in 1816 signaled a new era in transportation planning in the Commonwealth. Initially attention was devoted to the surveying of routes in response to individual requests. The first two principal engineers, Laommi Baldwin, Jr., and

Thomas Moore, directed this work, giving major attention to the development of specifications for roads and bridges that would provide adequate and uniform performance.

Following Moore's death, Claude Crozet was employed in 1823. He continued to process projects as directed by the Board, but his activities and surveys throughout the state convinced him of the needs for and benefits of a more coordinated plan.

By 1827, Crozet's work had given him a comprehensive idea and vision for the internal improvement needs of the Commonwealth. His report for that year outlined his views on the most urgent of those needs. The central element of his thinking was the James River and Kanawha Canal, which had been started in late eighteenth century and had progressed as rapidly as planned. To Crozet the canal was the main artery from which the other elements would radiate. With this in mind Crozet proposed a road from the James River Canal at Buchanan to Covington; an extension of the Kanawha Turnpike to the Guyandotte and Big Sandy rivers; a road from Charlottesville to Staunton and Parkersburg; connection of the James and Roanoke rivers; connection of the Roanoke and New rivers by canal or railway; and continuation of the Little River Turnpike from Alexandria through Winchester and Clarksburg to Columbus, Ohio.

These recommendations represented a bold and farsighted plan to unite the east and west. Not only would it provide communication between the established areas of the east and the developing areas of the west, it would also represent a commitment by the state to the developing areas that would mitigate the prevailing strong feelings of distrust and sectionalism between the two areas.

During the next twenty years several of Crozet's proposals were enacted, notably the road from the canal through Covington (the Blue Ridge Turnpike), the extension of the Kanawha Turnpike to Guyandotte, the road from Staunton to Parkersburg, and the road from Winchester to Parkersburg. These projects have been described in other "Backsights" articles ("Nineteenth-Century Superhighways," "The Kanawha Turnpike," "The Northwestern Turnpike," and "The Staunton and Parkersburg Turnpike," from September 1974 through January and February 1975).

Many of these improvements, as well as subsequent ones, are reflected in Crozet's map of internal improvements initially prepared in 1839 and revised in 1848.

Despite the soundness and boldness of Crozet's proposals, technological improvements that were developing would dramatically alter their implementation and, in fact, cost Crozet his position.

In August 1829, the Stourbridge Lion, an early locomotive, was imported to the United States; and in 1830 Crozet modified his proposal to recommend that as a consequence of the recent invention of the locomotive, a railroad would be the most suitable method of transportation from the western terminus of the canal to the Kanawha River. Because no railroad using steam locomotives had operated in the United States at the time, this was a bold recommendation.

Crozet's vision and his attempt to utilize this latest technological development put him at odds with powerful forces in the General Assembly, particularly Joseph C. Cabell, whose allegiance was to completion of the partially finished canal. Benjamin Wright (see the December 1972 "Backsights" article, "Benjamin Wright: America's First Civil Engineer") was employed in July 1831 to ascertain "with the principal engineer of this state, during the present year" the best route and mode of uniting the eastern (James River) and western (New River) waters.

Largely as a result of the controversy growing out of the Crozet proposal, the Board of Public Works was reorganized in 1831 with a requirement for annual approval of the principal engineer by the legislature. Also, Crozet's salary was reduced from $3,500 to $2,500. He resigned at the end of 1831 and spent the next six years in Louisiana. He returned to the position of principal engineer at the beginning of 1838 and remained in the post until 1843.

Although Crozet's recommendation that railroads were a better solution to Virginia's transportation needs than canals was ultimately vindicated, partisan controversy continued and culminated in 1843 with an act stating "that the office of chief engineer of the state be and the same is hereby abolished." A year earlier his salary had once again been reduced, this time to $2,000.

For those responsible for developing transportation plans, Crozet's experiences provide considerable solace. Despite the soundness and vision of such plans, changing technologies, as well as political and economic realities, require changes. Such efforts are, however, necessary and vital to efficient utilization of resources and demand a willingness to depart from traditional thinking. Thus, transportation planning has a long history in Virginia. Its fruits are visible in the current system, and hopefully the seeds of today's planning process will bear good fruit for years to come.

The Forgotten "Labouring Male Titheable"

Nathaniel Mason Pawlett

["Backsights" No. 37: originally published in the *Bulletin*, July/August 1977]

Most readers of Virginia history will readily identify the county official called the "surveyor of roads" or "Overseer of highways." Rooted in ancient English practice, the appointive office he held in latter years in Virginia became an elective one and survived into the twentieth century as one of the less sought-after positions in county government. Charged with the construction and maintenance of roads, the men occupying this office were the backbone of Virginia's road system from the first settlement until the dawn of the twentieth century.

While the overseers of roads have at least received an honourable (and, sometimes, a dishonourable) recognition in the pages of Virginia history, another group of perhaps equal, if not greater, importance have received almost no attention at all from historians. These were the men who actually did the work, that group referred to in the eighteenth century records as the "labouring male titheables" and consisting of all males aged 16 years and up, whether free or slave. Although a man who had several slaves usually did not work [the slaves taking his place on the road], it is still quite clear from this definition and from the surviving records that this was a rather broad and disparate group ranging all the way from the younger sons of the gentry who did not already hold some county office, on through the yeomanry, servants, and slaves. Certain occupations, such as ferrykeepers and tavernkeepers, were for obvious reasons exempt from the workings of the road law. But it was nevertheless true that throughout the seventeenth, eighteenth and nineteenth centuries most people found it necessary at some time to turn out at the call of their overseer of highways to work on some certain road for several days of each year.

This work, usually done at certain times of the year, might consist of anything from clearing and smoothing a new or old road through the digging of drainage ditches to the erection of road signs, direction signs or mile stones, even to the construction of footlogs and small bridges over streams or swamps. Major bridges, of course, were usually constructed by persons or companies who contracted with the county government itself.

Of the labouring male titheables themselves probably only a small proportion are actually listed in the individual road orders of the county courts. Even then the usual form was to cite the owner of a plantation, residence or other kind of establishment and require his titheables to work on a specific road, rather than to enumerate his children, in-laws, servants and slaves by name. Nevertheless, the road orders do provide some interesting examples for one taking the time to browse through them.

For instance, one might come across in the road orders in the order books of Albemarle County the rather picturesque name of Shadrack Battles. Among a host of biblical names strewn through the road orders, this would probably otherwise arouse little curiosity on the part of the reader. Were he to continue browsing, however, he might shortly make the discovery that Shadrack Battles was a member of that class of people referred to as "free persons of Colour."

Early Virginians were required to help with the construction and maintenance of the roads. ***[NOTE: This early 19th century engraving shows road workers in Yorkshire, England, but similar scenes would have occurred elsewhere in Great Britain, in Europe, and in the United States; from George Walker, "Stone-Breakers on the Road," from his series Costume of Yorkshire, 1814.]***

Some of these people would have been former slaves and some of mixed blood, while others were no doubt born of free parents. Indeed, as early as 1622, Anthony Johnson and Mary, his wife, listed as "free negros," were residing in old Accomack, later Northampton County, on Virginia's "Eastern Shore." It seems likely that a number of these people may never have been slaves at all.

The information concerning Shadrack Battles's status appears in an 1810 entry which, describing him, states that he had produced to the court proof of his freedom:

> Shederick Battles a man of Colour personally appears in Court and produceing satisfactory proof to the Court of his freedom. It Is order[ed] that the following description be entered as the regester of the said Shederick Battles to wit: a black man aged about fifty seven years five feet 10 ½ high left eye Out a scar on the left cheek Just below the eye no other scars or marks perceiveable.

This certification resulted from a law passed by the General Assembly in 1803 or 1804, probably as a result of the abortive Gabriel's Rebellion of 1800, in an effort to tighten Virginia's rather loosely administered system of slavery. One hidden effect of this law ultimately proved beneficial to the "free persons of Colour" themselves. This was the fact that the certification, once accomplished, actually provided recorded documentary proof of their freedom at the county level, thus circumventing any later attempt at their re-enslavement by any unscrupulous white person or slave dealer. By an Act of 1788 the General Assembly had already made this re-enslavement punishable by the death penalty.

Surrounding Shadrack Battles' certificate in the order book are similar entries which document the existence in Albemarle of a whole group of "free persons of Colour" at this time. Listed in these pages are Susanna Bowles, Lucy Barnett, Robert Battles, Nancy Battles (wife of Robert), Zachariah Bowles, Robert Barrett or Barnett, and, of course, the Battles, Shadrack and Shadrack, Jr. Of these, Robert Battles and Zachariah Bowles are also listed amoung the many white labouring male titheables in the road orders of Albemarle County.

Beyond this certification the order books contain a number of the entries concerning these people. Interestingly enough, two of them involve a suit by a female member of the Battles clan against two white men for a debt. (She collected!)

Returning to the original subject of curiosity, the rather picturesquely named Shadrack Battles, it appears that he, along with several other members of this little group, had served as soldiers during the American Revolution. Apparently of something akin to yeoman status before the war, Battles owned 200 acres of land along Hardware River, which he sold in 1775. A carpenter by trade, he joined George Gilmer's company of volunteers, although he did not march with them to Williamsburg. Enlisting in Captain James Franklin's 10th Virginia Regiment in Amherst County in 1777, Battles served through the war, participating in the actions of Brandywine, Germantown, Monmouth and Savannah. Looking back, perhaps nostalgically, in 1820, he claimed that he was the "right hand man" of Clough Shelton, Franklin's successor as captain of the regiment.

Further research would doubtless turn up much more information on Shadrack Battles and his cohorts. A small property holder, a craftsman, a Revolutionary soldier, a family man, at various times and places one of a multitude of "labouring male titheables" for several days of each year, he was, except for his colour, probably little different from his white counterparts who worked alongside him to produce the county roads which were the predecessors of Virginia's twentieth century highway system.

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Private Roads and Bridges: "A Great Convenience and Satisfaction, Even If Expensive"

Howard H. Newlon, Jr.

["Backsights" No. 38**:** originally published in the *Bulletin*, September/October 1977]

The roads and bridges that now serve Virginia were, for the most part, originally built by governmental units or under their jurisdictions. Prior to the creation of the Board of Public Works in 1816, such construction was done or contracted by the counties, except for very large projects that were authorized by special legislation of the General Assembly. After the creation of the Board of Public Works, the majority of road and bridge projects were built by joint stock companies, primarily organized and funded from both private capital and state and local subscriptions. In addition to these government funded projects, there were a significant number that were completely the work of private individuals. Originally built for the use and convenience of individual landowners, many of these roads and bridges became a part of the county system and were later taken over by the state. While no complete inventory of these has been made, several examples survive as illustrations of the contribution of these privately built facilities to the state's road system.

While America's first road law, passed by Virginia in 1632, directed the county courts to build and maintain important roads or "convenient wayes" during the early years of the Colonial period, the only real wagon roads were private cartways and rolling roads on the various plantations where they were essential to the cultivation and carriage of tobacco. Confusion about whether a road was public or private sometimes lessened the effectiveness of public control and led the Assembly, from time to time, to pass statutes requiring plantation owners, mill owners, and others to open usable paths and roads across their property. Often special inducements were offered to get the owners of these private roads to open them to the public.

Long-distance travel up through the eighteenth century in Virginia was probably not unlike the situation described by George Washington in May 1773 on his return from Philadelphia through Maryland, where he paid seven shillings and sixpence for a guide and noted that the roads north of Baltimore ran through farms and that much time was lost in stopping to open and close gates each time the road passed from one field to another.

In the early nineteenth century, the grand jury of Botetourt County indicted several persons for building fences across local roads. The bill stated that "George Kish . . . farmer, on the 14th day of May, 1808 . . . with force of arms did obstruct the highway leading from the Big Lick [Roanoke] to Stoners [Bonsack] by building a fence across the said highway, and did suffer said fence to be continued across the said highway from the said 14th of May, 1809 until the 13th day of November, 1809 . . ."

The road, of course, is now US 460.

These and similar records indicate that many of today's public roads originated as roads built by individuals to serve their own needs, and also that some individuals often considered public roads through their property as their own.

During the nineteenth century, governmental units assumed more and more of the road and bridge building effort, but private individuals continued to fill gaps. In 1891, a group of New Market citizens began a campaign to replace the bridge between their town and the New Market depot to the west. In requesting financial aid from Shenandoah County, they argued that in the 1860s "the citizens of the community opened a road to the depot, paying $2,950, besides some labor, for land damages, grading, bridge, etc.; that the bridge taken away by the flood of 1870, was rebuilt at a cost of $1,500; that in 1878, they built another bridge at a cost of $1,500; that about $3,000 was received for tolls, which was expended upon the bridges and road making, a total of $9,000 expended by our people, without any help from the county, up to the time the county condemned and took the road and bridge some two years ago—no one receiving any return for the money contributed, except the use of the road. So far the county has only allowed $900, and the bridge stands condemned by the road board."

In addition to construction by groups, some individuals, for their own convenience, built sizeable bridges and lengths of roads. In 1891, F. H. Whisler, who earlier had owned the Columbia and Liberty Iron Furnaces in Shenandoah County, purchased the Meems Farm, and in 1894, John W. B. Woods completed a covered bridge for him over the North Fork of the Shenandoah between the Valley Pike and Strathmore, the large home on the farm. J. L. Olinger, of Quicksburg, furnished 57,000 feet of local timber for the bridge, which became known as the Meems Bottom Bridge. This structure stood on Route 720 until October 1976, when it was burned by vandals. Plans are progressing for its restoration. *[NOTE: The Meems Bottom Bridge was subsequently restored and was reopened to traffic in September 1979.]*

The next year, in 1895, Woods completed a 75-foot, Burr-arch covered bridge for D. U. Biedler in Rockingham. The newspaper, *The Shenandoah Valley,* reported in its edition of August 8 that Messrs. John J. Estep and J. Michael Zirkle, two expert stonemasons from Forestville, had completed two large stone abutments and that Mr. Biedler was cutting down two steep hills on his new road. In its December 12th edition, the paper reported that Mr. Biedler's bridge across Smith Creek was complete. The report noted, "It is a simple span, wood, covered bridge, well built in every particular—strong, durable, and substantial. Mr. W. is a veteran at the business, and surpassed himself in this structure. The fills have been made—one not quite fully completed—and the bridge is used every day—a great convenience and satisfaction to Mr. B. and family, even if expensive." This bridge, which still serves the farm, has escaped general attention outside of its immediate area.

[*Image in original:* The Biedler Bridge in Rockingham County. *Caption:* Built in 1895, the Biedler Bridge in Rockingham is still in use.]

Individuals also constructed substantial roads. In 1874, B. H. Brennan of Buffalo, New York, purchased Carleton, an Albemarle County estate adjoining Monticello. (The Carleton site is now occupied by a large cemetery.) According to local records, at his own expense Mr. Brennan constructed a $75,000 private macadam road from Market Street (Three Notch'd Road)

to his home. This was described as one of the first examples of this method of road building in the county. While the cost figure seems high, the road was several miles in length and now is partly incorporated into Charlottesville's street system as Carleton Avenue.

These examples, along with others as yet undiscovered, indicate that construction by individuals played an important role in the evolution of Virginia's transportation system. The "satisfaction and convenience" originally intended for the builder and his family have, in most cases, become a legacy for all who travel the "convenient wayes" of the Commonwealth.

The Somewhat Chequered Career of Taverns and Ordinaries in Virginia

Nathaniel Mason Pawlett

["Backsights" No. 39: originally published in the *Bulletin*, November/December 1977]

Taverns and ordinaries had a rather chequered career over the first three centuries of their existence in the Old Dominion.

A necessary adjunct to travel by horseback and coach during the seventeenth and eighteenth centuries, they were to a large degree obsoletised by the coming of the steam railroad in the 1830s as travelers gradually began to avail themselves of the new mode of transportation. As railroads replaced stage lines many of these public houses were forced either to cater to a strictly local clientele or else to revert to use as dwelling houses.

The advent of the motor car in the early twentieth century, a development which could have provided for their resurgence, served to produce a different kind of institution: a whole set of filling stations, garages and tourist courts, with functions to which the old taverns and ordinaries were ill-suited for adaptation.

Besides the changing needs of the travelers, the automobile itself also demanded straighter, smoother roads if its full potential was to be realized. A political necessity, these good roads were not long in coming, and with the straightening of the existing roads, the old tavern or ordinary quite found itself isolated and left to fall into ruin on a forgotten loop of the one route. Although many of these establishments have fallen prey to time and the elements, as well as to negligence, many still survive along such once-thriving thoroughfares as the Three Notch'd Road, where a dozen or so of circa 1800 or earlier vintage still stand.

Although the *Oxford English Dictionary* defines "ordinary" as a public meal regularly provided at a fixed time and a fixed price, or as an eating house where such meals are served, in Virginia, the "tavern" and "ordinary" came to be used more or less interchangeably by the populace.

Hening's *Statutes* lists the first legislation on taverns and ordinaries in Virginia in January 1639 Old Style, but the act itself implies that there had been some previous action by the General Assembly on the subject of the rates which could be charged by keepers of taverns and ordinaries when it states that a meal or a gallon of beer would now sell for 12 pence, down from the previous rate of 18 pence or 6 pounds of tobacco. The price was reduced because of a plenty of provisions available within the colony.

Apparently this act did not have the desired effect and tavernkeepers continued to charge "whatever the traffic would bear," for a few years later, in October 1644, another act, complaining of the excessive charges, proceeded to set rates for the colony. Besides setting rates, the act stated that debts for "wines and strongwaters" were not to be recoverable by law.

Presumably transactions thereafter would be quite literally "cash on the barrelhead" to all comers.

Long before Prohibition and the age of "bathtub gin," adulteration of alcoholic beverages was an issue of some moment in Virginia, if an act of about the same time complaining about this as well as the still exorbitant costs of potables is to be believed. Shortly, in an act of March 1654 O.S., the Assembly gave to the county courts the power to license ordinaries but still retained for themselves the power to set the rates for food and drink. After March 1658 O.S., the county courts were empowered to set the rates and to vary them as tobacco prices rose or fell (tobacco then served as money in Virginia). A license from the county court and a bond for good behaviour were also necessary.

Unauthorised drinking houses were always a nuisance in these rather lusty times, and one of the stated reasons for requiring a license was the "preventing of many disorders and riotts in ordinaries and other places where drinke is retayled."

Besides adulteration and exorbitant prices, another hazard faced by the Virginian in pursuit of liquid refreshment was that of getting a short measure from the keeper of the tavern or ordinary at which he normally dealt. Again, a crisis in drinking led to a legislative enactment, this time an act of March 1661 complaining of the short measure being given and directing the keepers thereafter to sell by "English sealed measures of pints, quarts, pottles or gallons," with every ordinary required to have these and to measure out the beer, wine and spirits with them. Those purchasing by the bottle could also avail themselves of the measures to see that they were not being cheated and were required to pay only the legal rate for the amount the bottle actually contained.

Ordinaries, grog shops and tippling houses apparently continued to proliferate in Virginia for in 1668 the General Assembly, complaining that there were too many, passed an act calling for no more than one or two per county. Preferably, these would be located at the courthouse or else at "ports, fferryes and greate roads" for the convenience of travelers.

Continually a source of trouble, the "site of tumults and riots," ordinaries were, with few exceptions, suppressed during the time of Bacon's Rebellion in 1676, and the next year the limitation to two per county was reenacted.

If the story of early legislation on the subject seems repetitious, this was indeed the case with the problem of regulating ordinaries and taverns throughout the colonial and ante-bellum periods in Virginia and down to the creation of the present ABC Board. Short measure, adulteration, and excessive pricing, as well as the gaming, cockfighting, and horse racing which usually went on there, tended to bring these issues before the Assembly perhaps oftener than the legislators might have liked.

It must be remembered, however, that in the seventeenth and eighteenth centuries particularly, and for a great part of the nineteenth, the tavern or ordinary (and later the general store) was the focal point of life for many Virginians. Here they met their compatriots and conversed over a social glass, read the newspaper or, in many cases, had it read to them, amused

themselves with games of one sort or another, and often conducted business. The county courthouse and the parish church served much the same function in many respects, but they were attended only periodically on court days and Sunday, while the genial tavernkeeper stood always ready with a bowl of toddy or a julep, a copy of the *Virginia Gazette* and a hilarious anecdote or two.

Often the ordinary itself stood adjacent to the court house and the clerk's office in the classic Virginia arrangement serving as a semi-official adjunct to the business of county government. Hanover Court House comes immediately to mind in this regard but many others fit the pattern as well.

Whether located near the court house or not, taverns and ordinaries themselves covered a broad spectrum from the large, mansion-like buildings down to the very humblest of structures, often no more than a dozen feet square, and of the rudest log construction and finish. Sometimes appearing wonderfully rustic and picturesque to the traveler, with their steep roofs, multiple porches and oddly placed additions, inside they could be anything from delightful to disgusting in the fare and accommodation they presented to the visitor. At the meaner sort in the back country one might be offered only hoecake and bacon washed down with coffee or whiskey, but at the best the food might be described in superlatives. The Raleigh Tavern at Williamsburg, for instance, advertised in 1859 that its table was "furnished at all times with the epicurean delicacies of the seasons, including wild ducks, turkeys, partridges, venison, fresh York River oysters, crabs and fresh fish of all kinds . . . Its bar continues to be proverbial for the best liquors."

A turnpike traveler commented of another tavern: "The eating was the cream of the earth, Sir, having dined at Delmonico's last week, I found my dinner there was nothing by comparison with the venison cutlets, the grouse, mountain trout, and ham and eggs with creamy johny cakes that we were served along the turnpike!" Although these two were probably the best of the time, they might be placed in somewhat better perspective by recounting an anecdote, probably more indicative of the quality of the usual fare, concerning John Randolph of Roanoke. Randolph, noted for his acid tongue, arrived at an ordinary and, calling for something to drink, was served a beverage of questionable parentage. Cocking an eye at it for a moment, he turned to the waiter saying: "Waiter, if this be tea, bring me coffee; if this be coffee, then bring me tea!"

The characteristic Virginia county taverns which have survived are mostly of the second half of the eighteenth century or later. Unfortunately, none of the establishments of the seventeenth century are extant, unless one of the few surviving dwelling houses of that period also served at some time as an ordinary. The Virginia tavern of the later period usually contained several large rooms devoted to various uses, on the ground floor. The largest room, often called the parlour, was used for sitting and was furnished with a number of chairs, tables and benches or settees. At one end, or perhaps in the earlier examples in a corner, was a large fireplace which was the focal point of the room and was well supplied with wood during the cool months. Around this fire occurred, except at mealtimes, most of the life of the tavern. The room might be plastered or sealed with beaded plank but the floor was usually surfaced with a layer of sand or sawdust over its planks.

Another large room, oftimes the largest, was used for dining, although the dining room was often located in the basement adjacent to the kitchen. Somewhere, either in the hall, in a separate room on the porch or in a subdivision of one of the principal rooms, was the heart of the establishment, the bar, presided over by the proprietor. From this strategic location he dispensed the drams, juleps, toddies, gum-ticklers, phlegm-cutters and anti-fogmatics (a drink of any straight unadulterated liquor, taken at the White Sulphur Springs where heavy morning fogs were prevalent), which so relaxed and warmed the weary travelers in winter and cooled them in the summer. Upstairs the area was usually divided into two or more rooms. These rooms, separate sleeping compartments for men and women, might also serve for private dinners, drinking parties and card games. An early nineteenth century English lady, commenting on sleeping arrangements, said:

> There are always several beds in every room and strangers are obliged to sleep together. The sheets are mostly brown and seldom changed.

While the foregoing adequately describes such larger taverns as the one at Hanover Court House, Boswell's in Louisa County and Michie's in Albemarle, there were probably scattered around Virginia many more of the smaller variety, such as Yates's in Pittsylvania, and the Wilderness Tavern, and Sycamore Tavern at Montpelier in Hanover County. These smaller

Wilderness Tavern (Tabor's 1885 sketch from volume 4 of The Century Company's compilation *Battles and Leaders of the Civil War*, 1887-1888).

ordinaries, much as the fast food operations of today, combined all the operations (sometimes including sleeping) in one or two rooms on the main floor. It might also be mentioned that in both the small and large buildings the owner and his family usually also lived in a room or two. Often, of course, the tavern itself was actually a small dwelling house and, because of the limited business, remained very much so.

Many are the anecdotes of life in these ordinaries which can be found among the narratives of travelers through Virginia. Descriptions of the gaming, cockfighting, eye-gouging and quarter-horse racing abound, along with many more complimentary references. Indeed, these all no doubt existed, even when allowance is made for some exaggeration on the part of these particular observers. No doubt innkeepers such as the gross and bloated one described by the Marquis de Chastellux at Louisa Court House did exist; likewise the eye-gougings such as those described by Thomas Anburey did occur, and an occasional murder or two, such as that of Robert Routledge by Colonel John Chiswell at the tavern at Cumberland Court House in 1766. But these were the exceptional rather than the ordinary occurrences of the old Virginia life which ebbed and flowed around these places. If there was much of crudeness, vice, and crime, there was also much of the merriment, raillery and good fellowship which was a large component of that life which George W. Bagby, looking back, described thus in the year 1877:

> In simple truth and beyond question there was in our Virginia country life a beauty, a simplicity, a purity, an uprightness, a cordial and lavish hospitality, warmth and grace that passes all language at my command.

Although the plastic beams and bogus English names of their twentieth century descendants bear only a superficial resemblance to the old Virginia taverns and ordinaries, a visit to one of the operational eighteenth century taverns of Williamsburg during the bustle of the Christmas season may provide one with a better appreciation for the inherent charms of these hostelries of yesterday.

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A Site on the Potomac

John Melville Jennings

["Backsights" No. 40: originally published in the *Bulletin*, January/February 1978]

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High on the agenda of the many matters confronting the founders of the republic was the problem of deciding on a site for the "federal city." The issue was publicly joined when, in the Continental Congress in 1783, Elbridge Gerry, of New England, moved that buildings be erected for the use of that body either on the Delaware River near Trenton or on the Potomac near Georgetown, provided that a "district" could be obtained for that purpose. While sectional lines were not immediately drawn, the Virginia and Maryland delegates naturally supported the Potomac location, and the members from farther north favored a point on the Delaware. Some legislative maneuvering ensued, and it led in 1784 to a survey of a site on the Potomac adjacent to the village of Georgetown. Later in the year, however, Congress adopted a measure calling for the erection of the projected town on the Delaware.

[*Image in original:* Old drawing of Georgetown. *Caption:* A drawing of the western end of Georgetown looking west along what was later Canal Road (or Aqueduct Road) from what is now Key Bridge. The canal later flowed through this same area between the road and the river. Three Sister Islands are shown in the background.]

Meanwhile, Thomas Jefferson, intrigued by proposals for making the Potomac a trade route from the Ohio Valley to the seaboard, had concluded that "Nature . . . has declared in favor of the Potomac and through that channel offers to pour into our lap the whole commerce of the Western world." George Washington and James Madison were fired by the prospect, Washington to such a degree that he became a principal figure, along with an unusual number of the Virginia and Maryland gentry, in launching the corporate Potomac Navigation Company in Alexandria in 1785. The work of the company progressed to such an extent that the project reduced the chances of creating a national capital on the Delaware.

Nevertheless, the Congress in 1787 rejected the Potomac proposal. In 1788, when the Potomac was opened to limited navigation through efforts of the company, the legislatures of both Virginia and Maryland each allocated districts 10 miles square for release to federal control if used as a site for a federal city.

But when a bill was introduced in 1789 in the First Congress under the Constitution to establish a seat of government, it quickly became apparent that the New Yorkers, backed by the New Englanders, wanted the government centered at New York City. The Pennsylvanians were equally resolved to locate the capital "somewhere in Pennsylvania."

The Southern delegates, on the other hand, remained firm in supporting the Potomac site. Although George Washington sought to stay aloof from the debate, William Maclay of Pennsylvania confided to his diary that "It is, in fact, the interest of the President of the United States that pushes the Potomac."

"He," Maclay continued, "by means of Jefferson, Madison, Carroll, and others, urged the business."

The purpose of the preceding paragraphs is finally reached, for the Virginia Historical Society, under the Carrie Wheeler Buck Memorial Fund, has acquired one of only two known surviving copies—the other is in the Library of Congress—of a superb broadside printed at Alexandria in December 1789, extolling the qualifications of Alexandria, and less forcibly those of Georgetown, as the site for the "Seat of Federal Government." Addressed to "the principal Towns in the Eastern States," the lengthy text, with quotations from Jefferson's *Notes on the State of Virginia*, supplied "an impartial and candid detail of those circumstances, which render the Potomack the most eligible situation in the Union." A committee of 10 citizens, appointed to convey "the Sentiments of the inhabitants of Alexandria and George-Town," signed the impressive representations. President Washington, let it be said, was not among the signers. But nine of the 10 signers were stockholders in the Potomac Navigation Company.

As far as can be ascertained, the text of the broadside has never been republished nor has it been cited in any of the numerous articles, monographs, and books treating the history of the nation's capital. Yet it was a significant document in the carefully orchestrated efforts of the Virginians—notably Jefferson—to locate the seat of government on the Potomac River. The final movement in that drawn-out matter was less edifying. Jefferson, in 1790, in return for Alexander Hamilton's influence in support of a southern capital, was obliged to deliver the Virginia congressional vote in favor of Hamilton's proposal for federal assumption of state debts incurred during the American Revolution. In these latter decades of the twentieth century, there perhaps are old-line Virginians who, contemplating the steady march of the federal metropolis across the northern reaches of the Old Dominion, view the bargain askance.

The Perils of a Pioneer Planner

Howard H. Newlon, Jr.

["Backsights" No. 41: originally published in the *Bulletin*, March/April 1978]

On Sunday, June 1, 1823, Captain Claud Crozet, professor of engineering at the U.S. Military Academy at West Point, arrived in Richmond and the following day took the oath of office as the third principal engineer of Virginia's Board of Public Works.

[*Image in original:* Photograph of Crozet. *Caption:* Claud Crozet.]

The Board, created in 1816, was in effect America's first transportation department, with responsibility for planning and funding internal improvements in the area from the Atlantic Ocean to the Ohio River. The Board consisted of 10 geographically balanced citizen commissioners plus the governor, the treasurer, and the attorney-general. Its technical expertise was furnished by the principal engineer and his assistants. In the office, Laommi Baldwin, Jr., and Thomas Moore had preceded Crozet, but it was this brilliant engineer, educated at France's famous Ecole Polytechnique, a member of Napoleon's staff, and tutor of the Russian Czar's children after his capture during Napoleon's ill-fated drive on Moscow, who was to have a singularly profound influence on transportation in Virginia, not only as the Board's principal engineer, but also as an engineer for the Blue Ridge Railroad and as first president of the Board of Visitors at Virginia Military Institute.

According to his reports, Crozet set about with diligence to complete numerous surveys and inspections of rivers and roads as directed by the Board. His major attention was directed toward the James River and Kanawha Canal, literally the keystone of the whole system of internal improvements since it was the only long-range east-west connection lying wholly within the state.

The east-west canal had initially been proposed to the House of Burgesses by George Washington after his western tour. Under the James River Company, chartered in 1785, the canal had progressed slowly. While the company reported in 1816 that the river had been improved from Richmond to Crow's Ferry (near Covington), a distance of 220 miles, there was extensive criticism that navigation in many places and during certain seasons was difficult and even dangerous. Bowing to such criticism, the General Assembly on February 17, 1820, had authorized purchase of the rights of the James River Company and the placement of the enterprise on the footing of a state work to be conducted by state agents. Thus Crozet began his work in an atmosphere of deep division between proponents of private and public control of improvements and sectional antagonisms.

While the James-Kanawha improvements received his major attention, during Crozet's initial years, numerous roads were surveyed as he recognized that the state's internal improvements program could not function properly without an excellent tributary road system.

By 1827 Crozet's work had given him a comprehensive idea of Virginia's problems in the internal improvement field. His report for that year expressed his views on the most urgent improvements for the state. He recognized the James-Kanawha line as the main artery of improvement and with this in mind urged the following: (1) a road from the James-Blue Ridge Canal to Covington; (2) extension of the Kanawha turnpike to the Guyandotte and Big Sandy rivers; (3) a road from Charlottesville, via Staunton, to Parkersburg; (4) connection of the Roanoke and James Rivers; (5) connection of the Roanoke and New Rivers by canal or railway; and (6) continuation of the Little River Turnpike from Alexandria through Winchester to Clarksburg to Columbus, Ohio.

This was indeed a farsighted and comprehensive plan to unite east and west, combining as it did what would today be called the concept of "multimodal transportation." Perhaps even Crozet did not realize that within his own recommendations was the idea that was to spark additional controversy and frustration that would lead to his dismissal. This idea was incorporation of railways into the overall transportation plan.

During the 1820s champions of various methods of transportation had become active. Proponents of highways and waterways, the traditional modes, had been joined by proponents of the newly developed railway.

The discussion of various modes was subdivided. Should canals take the newer form of lock and dam or continue to use sluices, a relic from days when funds were not available for the more expensive locks and dams? If railway transportation were selected, should the motive powers be horses, mules, wind, or the newfangled steam engine?

In his 1827 report Crozet discussed at length the relative merits of sluice navigation and of a lock-and-dam canal. He strongly favored lock-and-dam improvements but he was not yet ready to recommend a railroad. However, three years later, in his 1830 report, he again compared the various methods of improving the valley of the James River and again expressed his detailed preference for the "lock-and-dam" improvement, and concluded that in consequence of the recent invention of the locomotive engine that a railroad operated by steam would be the most suitable method of transportation from the head of river navigation (near Buchanan) to the Kanawha River. This was a bold recommendation for which precedents were lacking. The Baltimore and Ohio was begun in 1828 and a short stretch was opened in 1830, horses and sails furnishing the power until steam was adopted 18 months later.

No steam railroad had operated in the United States when Crozet unfolded his bold plan to integrate the existing canal with the railroad extension. His plan was opposed by Joseph Carrington Cabell, a powerful force in the legislature who steadfastly held to the original plan of an all-canal connection to the Ohio River. Opposition also came from a group led by Wyndham Robertson, later to be the governor of Virginia, that favored an all-rail line from Richmond to the Ohio River.

Caught in this political crossfire, Crozet's visionary plan that clearly was the most economical way to salvage the tremendous existing investment in the canal and to utilize the newly available locomotive to conquer the mountains that had blocked the progress of the canal

for decades was doomed. Cabell's canal policy was favored by an overwhelming majority of the legislature.

Largely as a result of this controversy the Board of Public Works was reorganized in 1831 and Crozet's salary was reduced from $3,500 to $2,500 per year. Five days later the Governor was "authorized to employ a skillful engineer, whose duty it shall be, together with the principal engineer of this state . . . to ascertain the best route and mode of uniting the eastern and western waters. Judge Benjamin Wright, America's first civil engineer and builder of New York's Erie Canal, was employed.

The lengthy reports of Wright and Crozet were presented within a week of each other. Wright favored a continuous canal as opposed to either the combined system or the railroad. He believed that Crozet's estimate for the lock-and-dam canal operated by steam was too low and that either the steam canal or steam railroad would require too much mechanical skill.

Crozet defended his estimate and by now stated that since the lock-and-dam system and the railroad would cost about the same, he now favored the railroad on the basis of long-range economy. He concluded that if economy were paramount, the lock-and-dam system would suffice, but otherwise "a railroad is undoubtedly the system I should prefer . . . if Virginia is prepared to expend three millions of dollars upon an improvement up to the mountains, it is certainly not to a canal I wish to see them applied." He also chided Wright's asking why oppose steam power "because it requires too much mechanical skill! Is this a general principle, or merely applicable to Virginia"?

The case was decided against Crozet and the effects of the decision were far-reaching. Crozet resigned and went to Louisiana, Cabell became the first president of the canal company, and Judge Wright became its chief engineer. A part of the canal was eventually completed and ironically, time was to see its towpath become the bed of a railroad.

After seven years in Louisiana during which he contributed to the development of railroads there and served as president of Jefferson College, Crozet was recalled in 1838 as Virginia's principal engineer. He directed many significant projects but his effectiveness was reduced by past controversy. In 1842, after several years of economic depression, a flood severely damaged the canal. Letters began to appear reminding the leaders "the state engineer knew you were wrong from the beginning and told you so . . ." The partisan comment hurt Crozet, and despite his prophetic vision, it was not surprising that he again came under scrutiny of the legislature, this time its committee on retrenchment. In 1842 his salary had been reduced to $2,000 and on March 27, 1843, the legislature passed an act which read, "Be it enacted by the General Assembly, that the office of chief engineer of the state is hereby abolished."

Thus came to an end Crozet's state employment. He retained the respect and admiration of some high in authority and oversaw the extension of the Blue Ridge Railroad which was notable for his famous tunnel at Afton. Much of his attention was directed toward the new military institute at Lexington. During his difficulties in 1831, a writer had stated: "Although his vision was prophetic, it was too great for the Virginia of that day." Thus are the perils of a prophetic planner. The *Dictionary of American Biography* concludes that: "he had the vision

and the technical ability to plan a great development of inland communications by road, canal, and railroad, which, though never entirely carried out, gave Virginia one of the best road systems for a time."

The Reverend Robert Rose and His Marvelous Tobacco Canoes

Nathaniel Mason Pawlett

["Backsights" No. 42: originally published in the *Bulletin,* May/June 1978]

Although the diary of the Reverend Robert Rose has been known to scholars a for many years, both in the original and in a partially annotated typescript, it is only with the recently published volume edited by the Reverend Ralph E. Fall of Port Royal, Virginia, that it has become generally available to the reading public. Encomiums are due the Reverend Mr. Fall for his perseverance in completing a task which had previously defeated those who attempted it, among them the nineteenth century Virginia historian Hugh Blair Grigsby.

Fall's copiously annotated and illustrated volume *(The Diary of Robert Rose,* McClure Press, Verona, Virginia, 1977) provides a definitive picture of one of early Albemarle County's "first gentlemen," his association with other first gentlemen such as Peter Jefferson and Joshua Fry, his service as the Anglican minister of both St. Anne's Parish in Essex County and St. Anne's in Albemarle, and his travels between the two, besides elucidating the internal workings of a recently developed up-country tobacco plantation and how its product was transported to market via the Tye and James Rivers on the double-dugout canoes Rose is credited with having invented.

Robert Rose, the diarist, was born at Wester Alves in Scotland on February 12, 1704, and died at Richmond, Virginia, on June 30, 1751. Rose came to Virginia in 1724, at the age of 20, already ordained and licensed, to serve for a year as minister of a chapel Alexander Spotswood, lately the governor, had erected at his seat, Germanna, in Spotsylvania County. A year later, in 1725, he became the minister of St. Anne's Parish in Essex County, a post he was to hold until 1748. Proposed as minister of the new St. Anne's Parish in newly formed Albemarle County in 1744, he finally got the post four years later. Thus, in 1748 Robert Rose and his family left the parish glebe in Essex County and moved to a new home called Bear Garden and located in the forks of the Tye and Piney Rivers, then in Albemarle County though now located in Nelson. Here he was to live until his death in 1751.

Rose was not the first of the gentry from the lower country to take up residence in Albemarle with the intention of increasing his fortune. Joshua Fry, who held a master of arts degree from Oxford and who had taught mathematics at the College of William and Mary, had preceded him, along with Peter Jefferson and others. These men had moved into the vast new county with great expectations and had proceeded to engage in business at a number of different levels as explorers, planters, surveyors, militia officers, justices of the peace, land speculators, and, finally, as would shortly become evident with the publication of the Fry-Jefferson Map of Virginia of 1751, mapmakers of a high order. Rose, something of a "universal man" himself, would also engage in a number of these occupations while in Albemarle County, but to them he would add several which Fry and Jefferson apparently did not have much to do with.

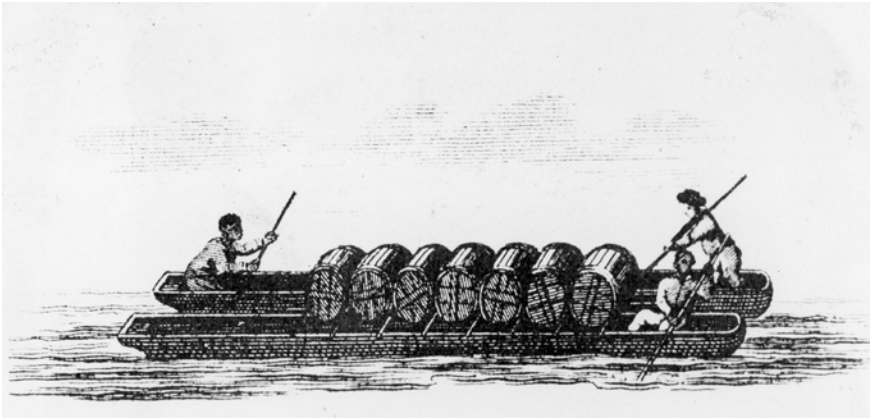
[*Image in original:* Section of the Fry-Jefferson map. *Caption:* A portion of the Fry-Jefferson map showing the route of the Indian Road through the Valley of Virginia.]

As originally constituted, Albemarle County was large, containing within it in all or part of eight present counties, among them Fluvanna, Nelson, Amherst, Buckingham, Appomattox, Campbell and Bedford. These last three were only partially within the county, which then and until 1754 included that area south of the James River but drained by it from the Blue Ridge to the head of Appomattox River. Although Rose owned a number of plantations at various locations his principal operations were along the Tye River in an area hemmed in by mountains and without easy access to eastern Virginia and its markets for his tobacco. Rose's ingenious solution to this problem is the subject of this article.

About 1730, as settlement had moved up the James River and into the Albemarle area, a number of large patents were issued to members of the Tidewater gentry, Richard Cocke's at Bremo in 1725, Nicholas Meriwether's along the Southwest Mountain north of the Rivanna River in 1730, and Secretary John Carter's south of the Rivanna along the same mountains might be enumerated. Of particular interest to our story is the patent of John Carter. In 1734, Carter opened a road from his operation to Bremo 25 miles away; this road survives as the Secretary's Road or Secretary's Old Rolling Road. Why Carter did this is uncertain since a road of less than half this distance would have put him on the James River in the vicinity of the present Scottsville. The best explanation for this would appear to indicate that the James River was then blocked to navigation, or at least extremely difficult to navigate, somewhere above Bremo, most likely at the place called Seven Islands. These blockages, rocks, shoals and islands, in many places doubtless also contained piles of brush and uprooted trees, making navigation extremely uncertain. It also seems likely that by this time Cocke would have been engaged in moving his own tobacco down river via lighters to Richmond and been quite willing to transport that produced by the Secretary's Quarter.

Just what the condition of the river above Bremo was at the time of the formation of Albemarle County in 1744 is thus far unclear, but that difficulties existed through the 1730s and well into the 1740s is manifest from legislation enacted in February 1745 (Hening V, 375, 377, *et seq.)* by the General Assembly. This legislation, nearly contemporaneous with the formation of Albemarle County, consisted of two acts. The first of them (Hening V, 375) was a general act empowering county courts to open rivers for navigation, while the second (Hening V, 377), much more specific, directed its efforts toward the clearing of the Fluvanna River, the name then current for the James River above Point of Fork, and appropriated 100 pounds sterling to be placed in the hands of trustees for the clearing of the "Rocky places" in the river. Rather significantly, three of the trustees named, Joshua Fry, Peter Jefferson and Charles Lynch, were prime movers in the development of early Albemarle, and were probably the authors of this particular bill. The remaining two, Benjamin Cocke and William Randolph, were from the area along the lower part of the James River nearer to Richmond.

Whatever was accomplished by the trustees as a result of this legislation, much room for improvement still existed when Robert Rose conceived the idea of using dugout canoes in tandem for the transportation of tobacco in hogsheads down the perilous Tye and James Rivers to Richmond. We could wish to know more about just when and how Rose got this idea, for he



Tobacco hogsheads being carried in paired canoes (from William Tatham, *An Historical and Practical Essay on the Culture and Commerce of Tobacco*, 1800).

made use of it almost as soon as his first tobacco was produced in that area. It is for the development and use of this novel mode of transportation that he has been most noted by Virginia's historians over the years.

Just when he developed it is somewhat unclear, the generally accepted date being 1748 when on March 14 he noted in his diary that "Richard Ripley and My people were making a Canoe, being the 3d for carrying Down Tobo . . ." Although subsequent notations appear to indicate a growing interest in and use of the canoes by Rose in his various enterprises, it might be argued that the first use occurred the previous year. Then, on September 10, 1747 Old Style, Rose noted in his diary: ". . . received an Acct from Mr. Thos. Atcheson that eleven hhds of my Tye River tobo was got down & Inspected: the first Fruits of seven year's Labour, having first seated these plantations by John Ray in Febry 1739/40." From this it is evident that Rose had already moved some tobacco from his Tye River plantations to Richmond where Atcheson was a tobacco inspector, but whether by rolling, by waggon or by water is uncertain. While it seems that Rose ought to have mentioned it had the canoes been involved, his notations are often incomplete in this regard. That the notation of March 14, 1748 Old Style, the first to specifically mention canoes, refers to the one then under construction as the third one adds to the confusion. Whether they were as yet being lashed together in pairs as operational units, an innovation attributed to Rose, is also unclear. There is also no mention of any prior reconnaissance by water of the Tye River, a fact which seems to indicate the possibility of a trip the previous year. Indeed, it would appear that Rose entered the tobacco transportation business with his canoes' first trip down the river.

Whatever the case, on March 16, 1748 O.S., Rose's tobacco canoes did leave his plantation at the intersection of the Tye and Piney Rivers, proceeding down the Tye River to the James where they took on board "some Tobo of Mr. Harvie's" and proceeded on down the James River toward Richmond. The Reverend Mr. Rose's brother, Alexander, his overseer and the joiner, Richard Ripley, who had constructed some or all of the canoes, went down on the canoes "some Miles to see the Nature of the Navigation," returning on foot. Thus, there is proof that the upper James River was navigable to a greater or lesser degree, and was being navigated from its junction with the Tye River downward, by at least 1747 or 1748.

From this time until the *Diary* ends in 1751, there are a number of notations concerning the canoes and river navigation. A few months later (May 5, 1749 O.S.) "my man Titus came home having run away from the canoes," notes Rose, an apparent reference to one of the slaves manning the canoes. A remark on the nineteenth of the same month casts some doubt on the efficacy of whatever arrangements had been made by the trustees appointed by the Act of 1745 to be responsible for clearing the James River. "Viewed the Seven Islands & think it a place safely to be made navigable," says Rose of a horseback visit to the place. Not all his activities on behalf of river navigation ended happily, as on the twenty-fifth he noted: "tumbled out of the Canoe into the River." The next March (1749 O.S.) he stated that his people were busy making canoes and on the twenty-ninth he noted the departure of four canoes manned by five people. Again Rose, his brother, and, this time, his son, rode down a way with them and walked back. Presumably this was to aid in the passage of the more difficult Tye River, their presence probably becoming unnecessary once the James River was reached. Although stated as "4 canoes" they were probably by this time lashed together in pairs with two people riding each pair. Each pair could have carried 9 or 10 hogsheads of tobacco, weighing at least five or six thousand pounds, down to the warehouses in Richmond.

It is evident from the next citation concerning the canoe that Rose was far from complete in his entries on this subject. Without previous mention of their departure downriver, on June 27, 1750 O.S., he wrote: ". . . this Evening my Watermen got home having safely carried down fifty & two hhds of Tobo, 29 of which are mine, two Mr. Benger's, 6 R. Powel's, 9 Edwd Spencer's, 3 Timo o'Brians's, one Thomas Jone's, one Mr. Goodwin's, one Wm. Ogilsby's." By this time he was acting as a wholesale transporter of tobacco for the adjoining planters besides the many other activities he engaged in. Unfortunately, we do not know how many of the double canoes were used to transport these 52 hogsheads of tobacco, although it seems a minimum of six, if not more, would have been required.

Were similar early documentary evidence available for other large upcountry planters it is likely that a number of them would exhibit this same preoccupation with transportation, both land and water. Indeed, the records of John Smith, a planter of the 1750s on the Staunton River in the neighborhood of the present town of Altavista, reveal that much of his tobacco traveled overland to the James River near the later site of Lynchburg and thence by water down the James River by the same route as Rose's to Richmond.

In July 1750 O.S., Rose traveled by canoe from Seven Islands down the river to Tuckahoe, where he visited with Colonel Peter Jefferson and then rode into Richmond. Rose says that the "Journey by Water was to view the River which may be made a very safe conveyance, considering that I was able to steer thro all the Falls without any difficulty." In a few short years, of course, many other Virginia gentlemen would be thinking in just such terms of river navigations and, a bit later, canals, and the James River would become the focus of Virginia's great effort in internal improvements under the Board of Public Works during the first half of the nineteenth century. Always with an eye to advantages in water transportation, Rose, while traveling beyond the Blue Ridge at John Salling's house near the site of present Glasgow just above Balcony Falls on the James River, in one of the last entries in his diary noted that Salling had "every advantage except the conveniency of water Carriage . . ."

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Illuminating a Dark Corner: Robert Rose, Road Builder

Nathaniel Mason Pawlett

["Backsights" No. 43: originally published in the *Bulletin*, July/August 1978]

The multi-talented Reverend Robert Rose, subject of the preceding article in this series, has through those entries in his mid-eighteenth century *Diary* dealing with road building in the Tye River area of Albemarle (now Nelson) County also helped to throw a little light on a subject much in need of illumination, early road building techniques in Virginia.

In attempting to study the history and development of Virginia's roads in that period prior to the advent of the nineteenth century road builders' manuals one encounters a paradox in that while there is a wealth of documentary evidence available in the archives of the various agencies at the state and county level, little of it describes the technology used. Most of the official records are in the form of legal enactments such as road orders, bridge contracts, and acts of the legislature, which, while directing that a road or bridge shall be constructed, do not set forth the details of how this is to be accomplished. The narratives of the individual road builders describing their activity is little better, although one occasionally does come across a few cryptic remarks upon the subject.

A similar paucity of material is found when one looks for detailed contemporary illustrations of road building activity during this period in America. Inquiries made of several print sellers and curators revealed that none could recall having seen any such prints. Several of them suggested that we resort to either English or Continental prints, with Thomas Rowlandson's name being mentioned.

This is indeed unfortunate, although it almost forces one to resort to the work of the British printmakers, work perhaps better than any American art which might have been available. Even so, the earliest English print found of road building work in progress was dated 1814, and a perusal of the illustrated work in which it was found would seem to indicate that the real upsurge of interest in prints relating to roads and travel in England occurred around 1800 with the improvements in roads prefatory to "the coaching age," that time of rapid stagecoach travel just before the advent of the steam railroad in 1829.

This lack of American prints of road building activity is not unusual in a country still little more than a provincial extension of England, and dependent on her for fine manufactured goods until well into the nineteenth century. But our inability to find much written material about the details and techniques of early road building here is more difficult to explain. Perhaps the best explanation, pending further research, would be to say that the art of road building was, during those years, an activity considered so mundane by those who practiced it as to warrant few written records.

One of these who practiced it and who did write about it, albeit sketchily, was the Reverend Robert Rose. Most writers, however, probably saw no more need to describe in detail

this activity than they would such things as the growing and processing of tobacco, exactly how they ate their meals, or how their houses were arranged. It took an English immigrant, William Tatham, to write the definitive work on tobacco culture here *(An Historical and Practical Essay on the Culture and Commerce of Tobacco,* London, 1800), and many of the various forms of vernacular architecture brought to Virginia from England are only now beginning to be investigated by scholars.

Perhaps the product of the movies and television portrayal of "the frontier," the conventional view of early roads has been that of primitive trails subject to little improvement at the hands of man; in short, many people picture paths blazed or marked and cleared through the forest primeval from cabin to cabin or fort to fort by men in coonskin caps. While this may have been the case in the West, and even in the very earliest stages of settlement here, this period must have been very brief for large areas of Virginia in the eighteenth century.

Even the word "trail" seems to be a misnomer when applied to Virginia lines of travel, "path" being the term used throughout the seventeenth century to denote both the ways of the Indians and those ways of the white settlers apparently not worthy of the name "road." The present usage of "trail" may even date from the later period of western settlement. All of this may seem to be an exercise in hairsplitting, since we tend to overlook the real differences in these terms, often using them interchangeably. However, consulting the *Oxford English Dictionary,* we find that the word trail is derived from a "trail," that which is left by the passage of a thing or person over a surface. Therefore a trail should be defined as the most elemental form of a path, a followable route, but little more. Next, in ascending order we find the path. This is a footway, "especially one merely beaten by feet," but not specifically constructed, permitting the passage of a person or a horseman, but not a wheeled vehicle. Paths suitable for travel on horseback were often designated as "bridle paths" in Virginia road orders.

Finally the *Oxford English Dictionary* defines "road" as a way suitable for the passage of wheeled vehicles. A road would then by definition include bridges over larger streams and possibly some grading while these would not be required on a path used only by horsemen and people afoot. It would seem, then, that the paths of the Indians became the paths and, shortly, the roads of the white men as settlement moved into the Piedmont in the years after 1700.

From the surviving records it is gradually becoming evident that the Virginians created a much more sophisticated road network than they have heretofore received credit for. After 1738 road signs appeared at intersections directing travelers to "the most noted places." Even prior to this some roads had mileage markers erected. The Three Notch'd Road is known to have had these by 1737, and William Byrd II mentioned having earlier seen thirteen miles of the road from Germanna to Fredericksburg similarly marked.

Whatever the deficiencies later exhibited by the county road system, in these years it was even possible to get intercounty cooperation for such projects as connecting a through road from Augusta County across Louisa, Orange and Spotsylvania Counties to Fredericksburg. Serving to further increase our knowledge of eighteenth century Virginia's road system are those few entries in Robert Rose's *Diary* dealing with road construction.

In addition to his interest in water transportation, always the best and most practical method for the conveyance of tobacco when available, Robert Rose on occasion turned his attention to the matter of roads and road building, thus providing us with some first-hand evidence concerning that subject about which so little has been written by those actually involved in it. Rose, located in the Piedmont upcountry in the shadow of the Blue Ridge, was involved in the construction of several roads and bridges, the last not as unusual an employment for a planter as it might at first appear to us. For instance, one "ffancis James" (the double small 'f' representing a contemporary substitute for the capital letter) was responsible for the construction of several bridges in Goochland County before 1744, all of which hardly made him a professional bridge contractor, since many other planters are known to have built bridges for the various counties.

[*Image in original:* The present day Nelson County area, showing Rose's plantation, on the Fry-Jefferson map. *Caption:* Rose's plantation is located on the Fry-Jefferson map.]

Rose's entries are more significant for their references to the building of roads than of bridges however, since he seems to have contracted to build no major bridges for the county of Albemarle. On January 27, 1748 Old Style, he mentions passing along "a Ridge marked for a Road." Later that same month, and extending into February, he was for five days engaged in road building and bridge building operations:

> January 30 - Cloudy, went with Mr. Harvie and my people on the Buffalow Road, moved a heap of stones . . .
>
> January 31 - Returned to ye Road, laid a bridge over Naked Creek part of another over a fine Spring Branch, returned in the Night—

The entry for February 1, besides noting the completion of the bridge over the Spring Branch, provides some indication of the sort of grading operations then being engaged in by surveyors of roads and their labouring male titheables. It also gives the actual number of men being employed by Rose on the project, information of considerable value by reason of the inferences which can be drawn from it.

> February 1 - Finished the Bridge over the Spring Branch, cut down the Bank at Buffalow, levelled part of ye Hill by Naked Creek & got Home at Night, these 3 days has cost Me 6 Men's labour, to do my Neighbours a pleasure before I have got Necessarys for myself—

Echoes of the phrase "cut down the Bank at Buffalow [River]," presumably referring to the descent to a ford, survive today in such names as Cutbanks Road in Appomattox County and Cutbanks Bridge between Brunswick and Dinwiddie Counties. On the following two days Rose, with some assistance, was working on a road which connected two rolling roads, roads used for the rolling of tobacco in hogsheads to market or perhaps to the Tye River, whence Rose's canoes may have transported them to Richmond.

> February 2 - Went with John Blyre, and cleared a Road thro Capt. Wilcox's land toward the Mill, very Cold, returned Home to Dinner—

> February 3 - Went and finished the above road being two Miles from one Rolling Road to the other, very Cold got home about 3 pm—

The foregoing enables us to gain a rather good idea of what road building operations were like in .the greater Albemarle of the mid-eighteenth century, and probably throughout the Piedmont and Southside. Of particular interest is the scale of the operations here cited by Rose. He mentions using 36 men, apparently most of the slave force at his home plantation, which numbered 39 at his death in 1751. Although this is a sizeable number of men to be employed on a project of this sort, he could have added about 20 more to this total had he also employed those slaves of his living on adjacent plantations, without taking into account whatever white indentured servants he may have possessed. Besides these, he still had a number of slaves located on his plantations in Essex and Orange Counties.

Too often, a casual reading of a road order reveals only the names of several planters and, while cognizant of the engineering and managerial skills of these men, we fail to take into account the potential labor force available for road work when two or three planters of the stature of Robert Rose, Peter Jefferson and Joshua Fry were assigned a road to clear or open. From the number of slaves known to be in the estates of many of these men at death, it would appear that the employment of 100 or more men at one time in constructing or opening a road would have been neither difficult nor unusual.

Besides the magnitude of the labour force employed by Rose, the amount of grading or levelling of hills is surprising in light of the notion prevalent today that such activities were extremely minimal in most of the early road building due to the lack of any sort of equipment beyond the pick and shovel of the individual labourer. What is perhaps forgotten is that a lack of equipment can often be overcome by a sufficiency of man power applied, a fact still well known in a good part of the world.

It is unfortunate that none of the other entries deal with roads in much detail, although he does mention “reconnoitring” a road (June 6, and September 27, 1750 O.S.), that he “obtain’d leave to open a Road to Rockfish” (August 14, 1750 O.S.) and on February 9, 1750 O.S., he mentions again that he “went and worked with ye people on ye Road all day,” indicating as usual his close supervision of, and participation in, that road building activity with which he was connected. While the quest for more detailed accounts of early road building activity continues we can be thankful for the insights provided by Rose’s *Diary,* and hope that they are the precursors of a clearer view of how the roads and bridges of what has been called Virginia’s Golden Age were laid out and constructed by such eighteenth-century gentlemen as Robert Rose.

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Follow the Poles, Watch for the Rocks, and Cross the Bridge Carefully

Howard H. Newlon, Jr.

[“Backsights” No. 44: originally published in the *Bulletin*, September/October 1978]

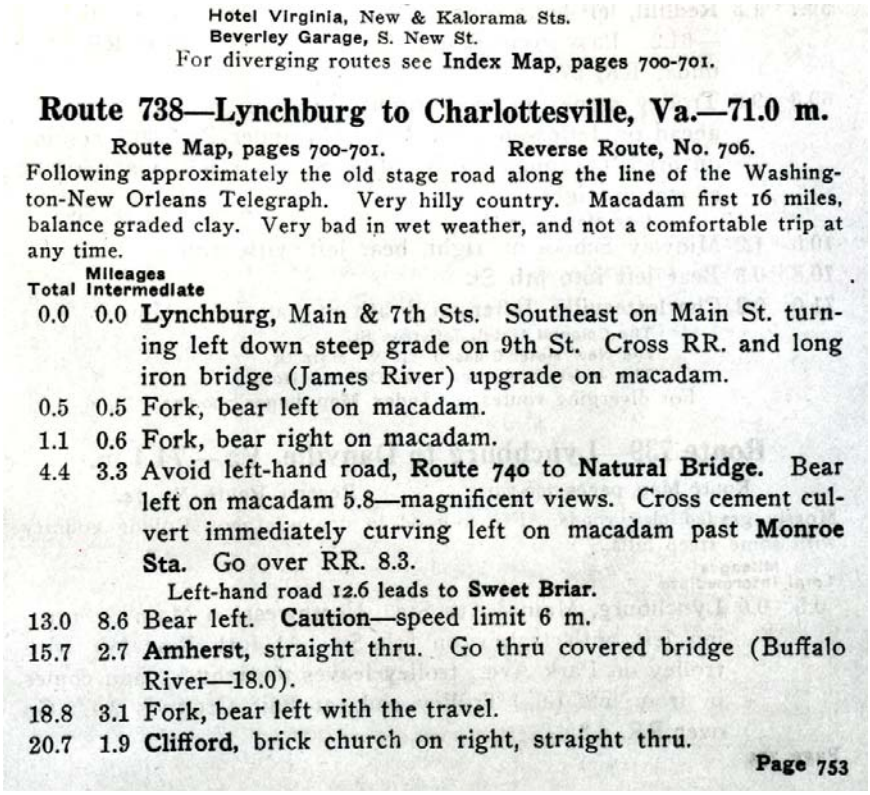
Several previous “Backsights” have described the perils of eighteenth and early nineteenth century travel in Virginia, based primarily upon accounts by English and other European tourists. These narratives abound with travelers’ descriptions of perilous stream crossings, lodging in unsightly and unsanitary ordinaries, and their periods of lost wandering because of missed turns or landmarks. One young English lieutenant wrote in 1779: “If perchance you meet an inhabitant and enquire your way, his directions are, if possible, more perplexing than the roads themselves . . .”

While one is inclined to consign difficult travel conditions to the era before the advent of the automobile, a recently acquired 1914 edition of the Blue Book, published by the American Automobile Association, is a vivid reminder that within the memory of some who still drive our highways a trip over the major roads of Virginia was an adventure rather than a convenience.

This well-worn guidebook was given to me by my father-in-law, the late Elmer Westerman, of Clifton Forge, and it was probably bought when he was driving automobiles from Michigan to Virginia for resale at Clifton Forge.

A 1915 photograph of E. C. Westerman, who owned the Blue Book used in the preparation of this article, with his Stutz automobile. Mr. Westerman was the author’s father-in-law.

The publication is identified as Volume Three and covers New Jersey, Pennsylvania, and the Southeast. A typical format for the route descriptions is shown in the accompanying illustration describing Route 738 between Lynchburg and Charlottesville. The reverse routes were shown separately. A brief, general description was given, including notes of important historical sites where appropriate. The 71-mile route between Lynchburg and Charlottesville was described as "very bad in wet weather, and not a comfortable trip at any time."



Hotel Virginia, New & Kalorama Sts.
Beverley Garage, S. New St.
For diverging routes see **Index Map, pages 700-701.**

Route 738—Lynchburg to Charlottesville, Va.—71.0 m.

Route Map, pages 700-701. **Reverse Route, No. 706.**

Following approximately the old stage road along the line of the Washington-New Orleans Telegraph. Very hilly country. Macadam first 16 miles, balance graded clay. Very bad in wet weather, and not a comfortable trip at any time.

Mileages Total	Mileages Intermediate	
0.0	0.0	**Lynchburg,** Main & 7th Sts. Southeast on Main St. turning left down steep grade on 9th St. Cross RR. and long iron bridge (James River) upgrade on macadam.
0.5	0.5	Fork, bear left on macadam.
1.1	0.6	Fork, bear right on macadam.
4.4	3.3	Avoid left-hand road, **Route 740** to **Natural Bridge.** Bear left on macadam 5.8—magnificent views. Cross cement culvert immediately curving left on macadam past **Monroe Sta.** Go over RR. 8.3.
		Left-hand road 12.6 leads to **Sweet Briar.**
13.0	8.6	Bear left. **Caution**—speed limit 6 m.
15.7	2.7	**Amherst,** straight thru. Go thru covered bridge (Buffalo River—18.0).
18.8	3.1	Fork, bear left with the travel.
20.7	1.9	**Clifford,** brick church on right, straight thru.

Page 753

A page from an early (1914) edition of the Automobile Association of America's Blue Book.

A route usually began at an important intersection or at a courthouse. Instructions for turns or other maneuvers were then keyed to the nearest tenth of a mile throughout the route. The routes described for Virginia include the corridors now occupied by portions of US Routes 1, 11, 29, 50, 220, 250, 301, and 460 and State Routes 7, 42, 168, and 249.

Since there were no consistent or uniform route designations at that time, it was necessary for the AAA to assign its own numbers to the routes. Actually, uniform designations as we now know them did not come into existence until the 1920s. Based upon the type of information in the Blue Book as well as material from other sources, it is clear that the roads were then still poorly marked. This situation led to a nationwide "trail movement" lasting into the 1920s in which certain major routes were identified on maps prepared by local touring clubs. A 1911 "Empire Tours" map of New York State showed the Adirondack, Iroquois, and Onondoga Trails in green, blue and orange, which corresponded to colors painted on telegraph poles along these routes by the Empire Tours Association.

The trail movement was later expanded to provide other, more enticing names such as Tip Top Trail, Tri-State Trail, Beeline Highway, Dixie Highway, Lee Highway, and Seminole Trail. This last was a designation for which no connection with the Indian tribe can be documented and which appears to have been a promotion of the tourist interests of western Florida, where it terminated.

The novelty and the rigors of early automobile travel are described in an article "Over Hill and Dale with Henry Ford and Famous Friends" that appeared in the July 1978 issue of *Smithsonian* magazine. This article described the annual touring and camping expeditions organized by Edison, Firestone, and Ford between 1916 and 1924. Edison usually served as "navigator" and was constantly chided for the bone-rattling routes he picked. The 1921 tour of Pennsylvania, West Virginia, and Maryland was the grandest, with cars, a fleet of trucks carrying five of the Firestones and four of the Fords, Thomas Edison, seven wives, one bishop, and President Harding and his large entourage, along with cooks, servants, and other assistants.

One imagines that something like a Blue Book was an important part of Edison's navigational aids, and the 1914 book is filled with instructions and statements that today seem quaint but which were then vital for anyone fortunate enough to own an automobile.

A very common direction was "bear right (or left) with the poles," emphasizing the prominence of the telegraph lines that commonly followed the routes or vice versa. While references to covered bridges and iron bridges are prominent, there are also numerous references to fords. For example, between Staunton and Roanoke, the crossings of at least seven fords are mentioned.

On a route between Richmond and Washington, which surprisingly went by way of Orange, Culpeper, and Warrenton, there is a notation concerning Tin Pot Run (between Remington and Opal) that says "turn right; crossing the ford." This is supplemented by a note instructing that "if ford is deep, use old bridge carefully." In this case, apparently, the ford was the lesser of two evils. A note concerning the ford between Brandy Station and Inlet counsels that "this ford is deep after rains and cars should keep left."

Although the direct route from Richmond to Washington through Fredericksburg was shorter, its use was discouraged with the notation that it was "a short, but miserable way connecting the two Capitals . . . dangerous in many places. Numerous fords, none of them big or difficult. Should positively never be attempted in wet weather."

Throughout the guide stretches of macadamized surface are identified with obvious pleasure. This is not surprising in view of numerous descriptions of the roadway obstacles. For example, at Fairfields between Staunton and Roanoke is the notation, "Caution for bad, high stones in road." On the route between Richmond and Washington that approximated US 1 about 7 miles south of Dumfries were multiple cautions. The first warned of a "sharp left turn downgrade with ford at bottom." Two-tenths of a mile further north was another notation giving "caution for sharp three-foot rise in road." It is interesting to note that on the reverse route this impediment was described as a three-foot drop. Once these had been negotiated, 0.1 mile further the admonition was "go thru ford and use extreme care in negotiating very sharp right and left

curves just beyond." This was probably near the Chopawams described in the account of John Randolph's 1820 trip between Richmond and Washington ("Backsights," November-December 1975).

Occasionally, reference is made to a directional sign, which must have been an oddity. The more usual landmarks were like those between Warrenton and Middleburg. At a point 3.3 miles north of Warrenton, we read, "End of road, turn left around store and next right at yellow store . . ." The next instruction comes 8.1 miles farther on and instructs the motorist to "curve right with poles and immediately take left-hand road at yellow house." Gray churches, red buildings, and other structures of various colors became vital landmarks. It is interesting to speculate on the consternation that must have developed if an owner decided to paint with a different hue. In addition to buildings, lesser structures, such as pumps and water troughs, were important keys to proper turns.

These directions reflect a rather uneasy coexistence between the road and the railroad, which it constantly crossed and recrossed. In the 71 miles between Charlottesville and Lynchburg, the railroad was crossed 11 times. In Culpeper County, the road crossed the railroad with a sharp right turn at Inlet and recrossed with a left turn two miles farther on at Brandy Station after negotiating the ford earlier.

In the description of the route between Staunton and Richmond, the climb up the Blue Ridge is indicated as starting at Basic City. This was one of the 1880s "boom towns," like Goshen and Buena Vista, that were planned to industrialize the mineral-rich area of the Valley. Now a part of Waynesboro, the hotel that serves as a part of Fairfax Hall is one of the few structures surviving from this interesting era of Virginia's history. A recent article in the *Culpeper News* describes the extensive efforts at automobile manufacture undertaken early in this century when five brands of automobiles were being produced. Basic City was the largest center for automobile manufacture outside of Michigan and was described as the "Detroit of the South."

Significant portions of the routes required tolls, often in rapid succession. At Berryville, for example, the description states, "pay 25 cents toll, and at fork by tollgate bear right, paying 50 cents toll for bridge across Shenandoah River." Even after these payments the driver encountered a "stretch of hilly, clay road, with some bad water-bars." Webster's dictionary defines a water-bar as "a ridge made across a hill road to divert rain water to one side." While the water-bars undoubtedly improved roadway drainage, they must have played havoc with oil pans and other mechanical items hanging below the car.

The magnitude of the tolls is somewhat surprising. The toll between Staunton and Winchester (for a runabout) was $4.56, with the instructions that you received "a string of tickets, leaving one at each tollgate along the route." Along the 91-mile route, the locations of 18 tollgates are noted. The justification for such a comparatively high sum was probably the fact that the road as described was "All good pike and macadam," a rather unique situation. On almost every route there was either a tollhouse, tollbridge or ferry. Rates varied from 3 cents per passenger on the Portsmouth-Norfolk ferry to 50 cents on the Shenandoah River bridge at Berryville.

Although the guide contains an amazing amount of detail, the needed instructions often defied clear explanation. On the road between Roanoke and Winston-Salem, North Carolina, there is an interesting entry opposite Stoneville, North Carolina, which reads, “if going to Greensboro make inquiries here for a shorter route.”

Earlier it was noted that Thomas Edison was often admonished by Henry Ford and his other traveling companions for selecting bone-rattling routes. Even a cursory reading of the 1914 Blue Book suggests that he had little choice. Often we think back with nostalgia for the time when the pace of life was more casual, but for those who travel today’s modern, well-marked highways it is comforting to know that we do not have to follow the painted poles, watch for rocks, and use the bridges carefully.

Historic Preservation and the Role of the Department

Howard H. Newlon, Jr.

["Backsights" No. 45: originally published in the *Bulletin*, November/December 1978]

The extent to which engineers and engineering organizations should be involved in preserving, or even identifying, their history and heritage was until recently easily answered.

They should not!

There was too much to do and too little to be gained by such pursuits. At the same time, historians, being educated to political, social, and military history, had neither seen the need for nor had the background to evaluate the history of technology, except to identify periods, events, and consequences as phenomena called, for want of a better term, "industrial revolutions."

But in the words of the Bob Dylan song "the times they are a changing," and historians are increasingly concerning themselves with technology. Likewise, technologists are recognizing, first, that they are part of a heritage which has contributed significantly to our society, and, second, that they are best equipped to evaluate the technical aspects of this heritage as opposed to the social consequences.

At the Bicentennial convention of the American Society of Civil Engineers held in Philadelphia in September 1976, Ernest A. Connally, associate director of the National Park Service, presented a paper entitled "Historic Preservation and the Role of the Civil Engineer." Since transportation is usually considered within the purview of civil engineering, it is of value to consider Mr. Connally's remarks in the context of historic preservation and the role of the Virginia Department of Highways and Transportation.

According to Mr. Connally:

> Things, and our relation to them, also help mark our location in space. That old joke satirizing whirlwind tours of Europe "If it's Tuesday, this must be Belgium" points out this fact quite nicely. We might just as easily say "If this is Belgium, it must be Tuesday." *Things*, then, are important in giving one a sense of his position in time and space. Thus, they provide signatures for his own sense of self. A large part of knowing who we are is knowing where we are . . .
>
> In our present context, we see that the objects around us, the products of former actions by people both living and dead, continue to shape our environment whether we are conscious of it or not. How true this is of engineering artifacts which have largely accounted for the configuration of our cities and their location. Transportation facilities such as roads, bridges, railroads, and canals; public works like wharves, water supplies and sewage systems; and nearly every type of factory industry have combined to touch each and everyone of us closely, to delineate patterns against which we habitually see ourselves . . .
>
> I suggest that one of the most important measures we could adopt is the preservation and interpretation of the relics of our engineering and industrial past. The informed presentation of these surviving witnesses of our national development would provide more understanding of a

> neglected aspect of our recent history and the processes which forecast the character of the future. If one picture is worth a thousand words, then the object itself must be worth at least a hundred pictures. The preservation of significant engineering and industrial sites is therefore a prerequisite for a comprehensible future . . . .

Beginning in 1973, the Research Council undertook research to identify those sites and events that belonged to the Department's heritage. Inventories of metal truss bridges have now been extended to other types of structures. Research on early roads has laid the groundwork to encourage local historians to develop detailed road histories for each of our counties. Several of these road studies have provided the context for a study of the architectural development by the University of Virginia's School of Architecture. These efforts, plus the vignettes provided through "Backsights," all have combined to increase awareness and appreciation by technologists and the laity for the efforts and contributions of our forebears.

Mr. Connally continued:

> Consider the absence of engineering and industrial things in the historic preservation landscape. The last few years have witnessed a change in the focus of the historic preservation movement in the United States. The early attempts at preservation centered on sites associated with military and political history. The first nationwide preservation campaign was launched in the mid-nineteenth century to save Mount Vernon from conversion into a resort hotel. Subsequently, the houses of other civic and military leaders and the sites of their achievements were the objects of preservation efforts. The battles fought by local groups won acceptance of historic preservation in this country as a worthy educational and patriotic endeavor.
>
> In time, the spectrum broadened to include the preservation of buildings with outstanding architectural values, their gardens and grounds. As a result, we have today hundreds of house-museums meticulously maintained as detailed documents of earlier epochs. A more recent trend in historic preservation has resulted in more recognition for the role of the average person in our history. Interest in vernacular architecture, the connective tissue binding the monuments in the *urban body,* has expressed itself in the movement to establish entire towns or neighborhoods as historic districts. Prior to World War II, there were only four such municipally zoned districts in the country. Now there are more than 200.
>
> Contrast the situation regarding the preservation of historic engineering and industrial sites. The wide-angle scope in the preservation of private residential and public buildings was partially brought about by the pressures of Federal highway programs and urban renewal, which threatened older neighborhoods across the country. The destruction of engineering and industrial sites, however, is not a novel occurrence. Rather, it is a distinctive aspect of that phenomenon which we call, for lack of a better term, the "Industrial Revolution." The rapid pace of technological innovation which we have experienced since about 1850 has meant a relatively short life for most of our industrial buildings.

In 1977, as an outgrowth of the Council's research, the Department nominated to the National Register of Historic Places seven of its metal truss bridges. This action clearly was an unusual step for a transportation agency to take because of the perceived loss of flexibility in future planning but represents a commitment to overcome the situation described by Mr. Connally.

Mr. Connally also observed:

The destruction of older structures and the abandonment of old processes have become institutionalized in the ethos of the engineering profession as signals of future progress. Rarely have any attempts been made to continue to use an old building or an obsolete process solely for its historic value. As far as we know, only one example survives of the Fink Truss, a form which served as a basis for the long-span bridges which carried the railroads across the broad rivers of the west. Railroad engineers during the 1850s and 60s were preeminent in building up a grammar of iron construction which provided the experience for metal-framed office buildings at a later date. It was no accident that Chicago, the city where the skyscraper was given vivid expression during the 1850s, was the greatest rail crossroads in the world . . .

The Research Council is now making an inventory of the state's metal truss bridges. ***[NOTE: This is the Virginia Fink truss described in the article.]***

Since Mr. Connally's presentation, it is significant that an additional Fink deck truss has been found in Virginia. The truss described by Mr. Connally is a through truss in New Jersey. The way in which the Virginia Fink truss was found is also highly gratifying. It was not found initially in the Research Council's survey because at that time it was not identified in the Department's bridge listing. Subsequently the bridge was brought to the Council's attention by operating people who, as a result of the research efforts, had been attuned to unusual truss configurations. Thus operations personnel, sensitized to historical values, are responsible for the ultimate saving of a priceless relic of our past.

Mr. Connally continued:

Yet, virtually nothing survives of the physical fabric of that industrial revolution. Most museums of natural history, in fact, contain a better record of the prehistory of the elephant than exists of the great steel skeletons which carried us westward to Chicago and beyond. The great increases in the size and speed of locomotives and rolling stock made some of them obsolete almost before they were opened. None of the early railroad bridges over the Ohio River lasted much into the present century. The vacuum created by the desire and necessity for innovation has

> contributed to what Toefler has called "future shock." The absence of the physical landmarks of engineering and technological growth means that the average person—who does not seek out such knowledge from books or museum exhibits—is likely to experience a sense of victimization. . . .
>
> In view of the pace of technical obsolescence, what can be done to preserve such cultural benchmarks? Can we expect individual companies to refrain from modernization at the risk of business failure? Probably not. Would we want the local highway commission to continue using a bridge in danger of collapsing under heavier loads? Certainly not. In an attempt at a partial solution to the problem, the National Park Service became party to an agreement with the American Society of Civil Engineers and the Library of Congress creating the Historic American Engineering Record in 1969. Of the several divisions comprising the National Park Service's Office of Archeology and Historic Preservation, the Engineering Record has assumed the primary responsibility for engineering and industrial sites. Since 1969, the Engineering Record has identified and documented important sites across the country through a combination of carefully-measured architectural and engineering drawings, large-format photographs and painstaking historical research. . . .

As noted by Mr. Connally, not all preservation efforts involve retention of the structure but instead concentrate upon retention of information. The Council's research has been closely coordinated with national activities. Both the HAER and ASCE are represented on the Council's History Research Advisory Committee. The Research Council has worked closely with the Department's Environmental Quality Division to record, according to the HAER, standard structures that are of technical interest but which do not merit retention. On a state level excellent working relationships have been established with the Virginia Historic Landmarks Commission, which also has a representative on the Research Advisory Committee. Ties have been strengthened with other local and statewide groups, such as the Virginia Canal Society. In response to requests from local groups in the area of the Meem's Bottom Covered Bridge, destroyed by vandals in 1976, the Department undertook a complex analysis of the structure and has recently awarded a contract for its restoration, when perhaps conventional engineering analyses would have resulted in its demolition.

Mr. Connally further stated:

> Our National Historic Landmarks Program, in accordance with the Historic Sites Act of 1935, is a cooperative program in which State and local agencies and professional historians, architects, and archeologists participate to identify historic properties significant to the Nation as a whole. With assistance from the Engineering Record and other branches, the landmarks program conducts studies of several thematic areas which include engineering sites: Engineering, Transportation and Communication, Commerce and Industry, and Western Mining. Until recently, however, the majority of engineering sites have qualified for landmark status principally on the basis of their social significance. The Erie Canal, for example, is recognized for its role in westward immigration and as an artery for the marketing of western produce in eastern ports. The canal's technical innovations and its functions as a school for civil engineers in this country generally go unrecognized outside professional circles. This unfortunate situation exists because we, as a society, have failed, or perhaps refused, to recognize the role that technology and material culture play in our lives and community development. The result has been an absence of any agreed-upon criteria for excellence and significance in engineering and industrial history. . . .

It is not surprising that much of our nation's industrial heritage is related to transportation. Canals, railroads, and roads provided the means for industrial and social

development hat is a fundamental requirement of society and which has been uniquely exploited in America.

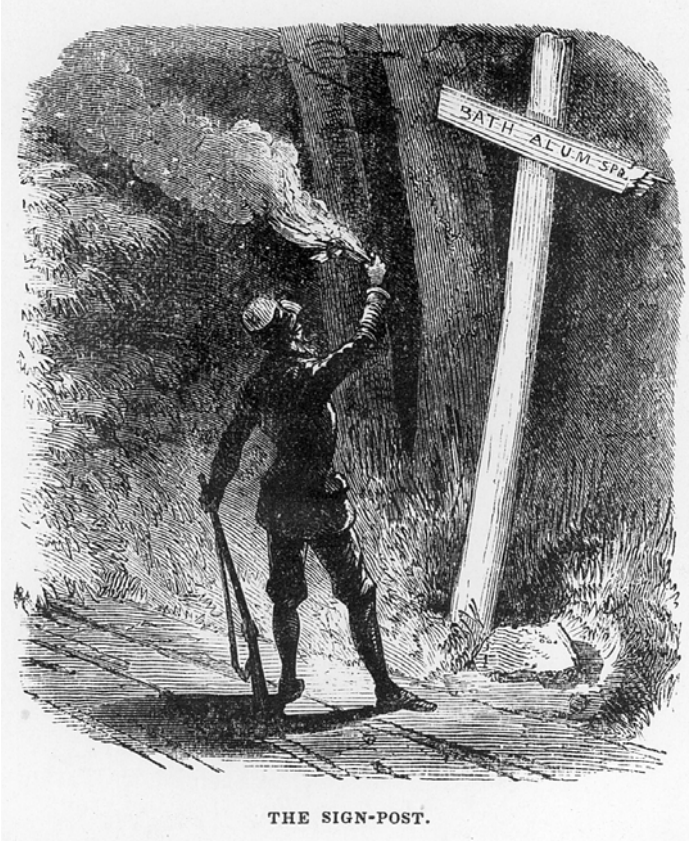
While technologists can recognize, study, and evaluate their heritage, it remains for the public, through increased appreciation of the significance of the industrial past, to provide support and encouragement for its preservation.

As Mr. Connally concluded:

> On the one hand, we have turned inventors' houses into engineering shrines, and on the other, we see attempts to reverse the mechanical trends of modernism. Neither, I believe, is a reasonable alternative if we seek to accord technology its proper place in society. To do so, we must remove engineering artifacts to the consciousness of a greater number of people. Engineering history that appeals to engineers alone is a cultural bridge with only one abutment. In a society that is daily more technologically sophisticated, the failure to bring our engineering heritage into the public awareness is akin to building a dam without taking core samples.
>
> The Office of Archeology and Historic Preservation is making efforts to provide a systematic basis for the documentation and recognition of historic American engineering contributions. The success of its programs, and others like them on the local and state levels, depends on the interest and support of local engineering societies and individual engineers. Engineering professionals must take an active role in the preservation of the artifacts of their discipline both by initiating specific preservation projects and by making their technical expertise available to historians and other preservationists. There is no substitute for the well-informed engineer with a sense of the history of his profession *and* of his town or region. I urge you, then, to become involved in these programs both on the local and national level so that the cultural bridge which we build to the future may be a well-wrought one without any missing chords.

The Department has assumed a leadership role in many of the matters suggested by Mr. Connally. Ours is an important heritage that needs preserving and interpreting to many people who look upon our efforts to provide modern, safe, and efficient transportation as destructive rather than constructive.

Each step brings with it new questions of responsibility to do more, and to balance the conflicting priorities of "progressive preservation." Where do we go from here? Perhaps we are like the nineteenth-century traveler depicted by Virginian artist Porte Crayon. Having begun the journey, he is now seeking directions on a dimly lighted and unfamiliar roadway. Completing the journey will require courage and a bit of faith, but as we build our bridges for future generations we should provide them the culture bridges to the past as Mr. Connally observed, with as few missing chords as possible.



Drawing of a nineteenth-century traveler by Virginia artist "Porte Crayon" [David Hunter Strother] ("The Sign-Post" from *Virginia Illustrated*, 1857).

[NOTE: The survey described in this article was the first inventory of early metal truss bridges conducted in the United States.]

The Role of Women in Eighteenth and Nineteenth Century Transportation

Howard H. Newlon, Jr.

["Backsights" No. 46: originally published in the *Bulletin*, January 1978]

The role of women in society has changed dramatically in recent years as they have assumed occupations and responsibilities formerly reserved almost exclusively for males. In light of the current entry of women into previously all male domains, it is of interest to explore the extent to which they were involved in the beginnings of transportation in Virginia and the new world. No definitive study has been made of the subject, but sufficient references can be found from a comparatively casual reading of available sources to suggest that women did assume a variety of roles in developing the nation's transportation system.

Much of what we know of the earliest roads and conditions in the new world comes from accounts written by English and European tourists who traveled in various parts of the colonies. Such travels were quite fashionable, particularly after the Revolutionary War. Naturally, most of the travelers were men, but several women were among these early chroniclers. Among them was Frances Milton Trollope, who arrived in 1828 intent upon making a fortune. After numerous failed businesses, she did become wealthy by writing her outrageous *Domestic Manners of Americans.* Another, who wrote of roads during the revolutionary period, was Charlotte Browne, a widow who traveled with her brother, a commissary officer in Braddock's army. Even earlier, Jane Fenn Hoskens described her travels on missionary journeys from Pennsylvania into Virginia in 1726 and 1744. Considering the conditions and conventions of the times, these clearly were women of independence and courage.

Conditions, particularly in ordinaries providing sleeping accommodations, were often far from ideal, as indicated by the observations of a wandering English lady who wrote "there are always several beds in every room and strangers are obliged to sleep together. The sheets are mostly brown and seldom changed."

As would be expected, women often operated the ordinaries that were an indispensable part of travel. Women became proprietors of these establishments either on their own or by assuming the duties after their husbands' deaths. Of 66 individuals granted ordinary licenses in colonial Yorktown between 1689 and 1780, 15 were women. Of these, 8 assumed operation of ordinaries that had been their husbands' at the time of their deaths. The earliest of these women began her operation in 1701. One lady assumed the mantle of ordinary keeper twice. In 1707 Humphrey Moody was granted an ordinary license in Yorktown but died three months later. His wife was granted licenses for the years 1708-1714, when she married her neighbor, Edward Powers. Powers operated an ordinary next to the court house until his death in 1719, after which Elizabeth Powers, nee Moody, continued the establishment until her death in 1729.

The ordinary of Polly Woods, one of the best extant examples, has been preserved by the National Park Service near the Peaks of Otter in Bedford County, as shown in the accompanying photograph.

[*Image in original:* Polly Woods' ordinary. *Caption:* The ordinary of Polly Woods in Bedford County.]

The records disclose that in addition to operating ordinaries along the various roads, the women also operated ferries or bridges and the taverns or ordinaries that often were associated with them. Illustrative of this situation is the case of Mary Tease (Teaze, Teas). References to activities of Mary Tease span the period from the 1780s to the 1830s so there may have been two women of the same name unless she was blessed with a particularly long life. Undoubtedly she was part of the Tease family that settled in the area of Waynesboro (Waynesboro was originally called Teaseville).

Among the earliest and most detailed eighteenth century travel accounts is that of the Marquis de Chastellux, who toured America during the period 1780-1782. Toward the end of his journeys he arrived in Teaseville (Waynesboro) on April 17, 1782. His stay with Mrs. Tease was described as follows:

> Two hundred paces beyond the ford, but more than forty miles from the place which I had set out from, I found the inn that Mr. Jefferson had indicated to me; it is one of the worst lodging places in all America. Mrs. Teaze, the mistress of the house, was some time ago bereft by the death of her husband, and I verily believe that she was also bereft of all her furniture, for I have never seen a more badly furnished house. A poor tin vessel was the only "bowl" used for the family, our servants, and ourselves; I dare not say for what other use it was offered to us when we went to bed. As we were four masters, without counting the rifleman, who had followed us and whom I had invited to supper, the hostess and her family were oblidged to give up their bed to us. Just as we were deciding to make use of it, a tall young man entered the room where we were assembled, opened a closet, and took out a little bottle. I asked him what it was. 'It's a drug,' he said, 'which our Doctor hereabouts has ordered me to take every day.' 'And what's your trouble'? I added. 'Oh, not much,' he replied, 'only a little itch'. I found this admission appealing in its candor, but I was by no means sorry that I had sheets in my portmanteau. It may easily be imagined that I was not tempted to breakfast in this house next morning.

The conditions at Mrs. Tease's were bad, but probably not untypical since her establishment had been suggested by Mr. Jefferson and, as De Chastellux continued in the next day's entry, "I set out therefore very early on the eighteenth, in hopes that we should find (as we had been told) a better inn, at the distance of ten miles, but these hopes were in vain."

In 1821 the General Assembly granted Mary Tease and Phillip Rootes Thompson authority to erect a toll bridge "at or near the mouth of the Coal River in Kanawha County." Mary Tease was identified as the widow of Stephen Tease. Extensions for completing the bridge were granted in 1828 and 1832. In a 1926 brochure describing the "Midland Trail Tour" along the old Kanawha Turnpike, reference is made to a house still standing on the west bank of the Coal River, opposite St. Albans, that was an early tavern, built by one of the first merchants of the place, James Teays.

Mary Tease was not the only woman to build and operate a toll bridge in Virginia. In 1821 the Assembly granted authority to Catharine Wager to erect a toll bridge at Harper's Ferry.

Women also operated ferries. In 1741, two years after the first ferry was established in Mecklenburg County, Martha Alexander was granted a license to operate it after the death of

Cornelius Keith, its originator. Lady Jean Skipwith, widow of Sir Peyton Skipwith, also operated a Mecklenburg ferry at a later date.

There are no records of women actually engaged in road construction, but contemporary accounts of macadam construction indicate that entire families were often employed to break up and sort the stones, all of which had to pass through a 2-1/2-inch metal ring. Undoubtedly women labored in this fashion.

The ninth edition of the *Women's Calendar* indicates that on May 17, 1830, Sarah Gibson Humphreys was born. She is identified as the "first woman in the United States voted to the board of directors of a public road by the officers and stockholders." The location is not given.

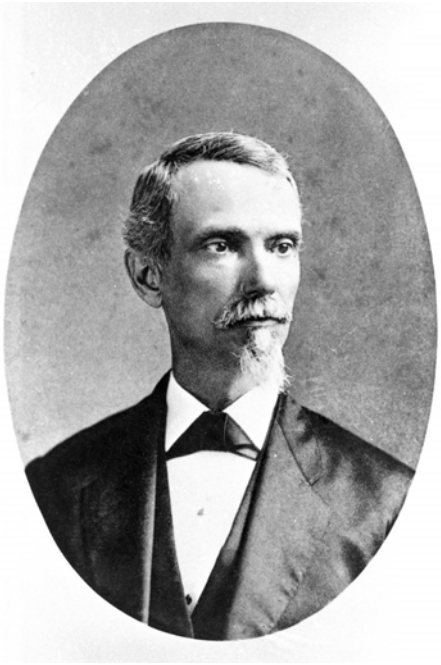
Although no definitive study has been done, it is clear that women have been involved in U.S. transportation for several centuries and have assumed a variety of roles. The tantalizing references to their operation of bridges or ferries and service on road boards suggest that this is an area worthy of further study.

George W. Bagby and the Bridge to Uncle Flatback's

Nathaniel Mason Pawlett

["Backsights" No. 47: originally published in the *Bulletin*, February 1979]

Occasionally road or bridge improvement projects proposed by the Department incur opposition on the basis that they are "not needed" or that they will alter the aesthetic or environmental character of the area. Often in these cases, citizens in the area directly affected have conflicting views, some supporting and some opposing the proposed improvement. These situations have been receiving a growing amount of attention in recent years because of the legal requirements for citizen participation and attention to environmental impact. Lest we somehow get the idea that these are entirely or relatively new concerns, the following portion of a humorous lecture written over a hundred years ago by George W. Bagby reminds us that conflicting views on the value of transportation improvements must have existed from the time the first one was made. Indeed, they are rooted in man's most basic instincts, the one of "progress" and the other, the conservative one, so well phrased by John Randolph of Roanoke when he said: ''Never without the strongest necessity disturb that which is at rest."



George Bagby (from *Selections from the Miscellaneous Writings of Dr. George W. Bagby,* 1884).

A native of Buckingham County, Bagby (1828-1883) produced a large body of literature dealing with the Virginia and Virginians of his time. Either humorous or laudatory, sometimes both, the best of this is still available in The Old Virginia Gentleman and Other Sketches. *Highly recommended are his essays or lectures styled "The Old Virginia Gentleman," "Bacon and Greens," ''My Vile Beard," and ''My Uncle Flatback's Plantation," this last from whence came the following excerpt. Virginians will immediately recognize Bagby's talent for depicting*

them "warts and all" from this thinly veiled sketch of his Uncle James Evans's (Uncle Flatback) plantation just west of Farmville in Prince Edward County.

> On the road from the mill to Uncle Flatback's there is a beautifully secluded and delightful bridge. Big trees, dressed with wild, luxuriant vines, bend over and frame it in from the workday, cornfield world on either hand. It is a matter of life and death to cross this bridge except on foot, and its use as a crossing for vehicles has long since been abandoned. The neighbors who used to patronize the mill abuse Patrick Jackson, the mill-owner, for not repairing the bridge, and Patrick Jackson, in turn, abuses the neighbors for not furnishing the timber. Both parties, I think, deserve leather medals for being gloriously lazy Virginians, willing rather to let things rot, and break the legs of horses . . . than to get into a Yankee stew and a New England fease the moment anything needs mending, and to work madly over every crack and fissure, as if godliness consisted in patching, and the world would be blotted out of existence the moment it ceased to smell of newly sawed pine and fresh varnish. For my part, I hope the bridge will never be mended, but stay just as it is until the bumbler-bees—humblebees? not any, I thank you—I speak Virginian, not the lingo of Bosting, or even of Ingling (perhaps you'd like for me to say England. I be blamed if I do) —until the bumbler-bees, and other borers, reduce it to wood-dust and scatter it atom by atom into the stream. As long as the bridge is in its present breakneck condition, Uncle Flatback's plantation will not be a thoroughfare for everybody who wants to take a short cut from the plank road to the old stage road to Richmond. I hate a place that is continually enlivened and afflicted by people travelling vaguely about in shackly buggies that can run along a road no broader than a hog path. There is no peace, no sense of ownership in such a place as that. You might as well have no place at all. The hands in the field are always stopping to look at these wandering vehicles, the axles of which invariably creak loud enough to be heard half a mile off. Like as not they'll break down right at your door, and the people will be sure to stay all the night, and the unclean-nosed child in the buggy (there is always one of them) will give your children the itch or the measles, and the black girl who rides behind the buggy will make herself generally obnoxious by fascinating the boy that brings wood into the house. Even if the fugitive buggy don't break down, from the moment it heaves in sight, everybody in the house, the kitchen, and the quarters is in a fever of uncertainty as to whose buggy it is; and as it comes up slowly, a half-hour or more is wasted in conflicting and vain conjectures, until it passes by—the man, woman, child, servant, and horse all staring stupidly at you and all your folks, who are staring stupidly at them; and when the plaguy thing is gone and quiet is once more restored, its horrid creaking leaves you with a toothache and a crick in the neck . . . I am not lacking in the natural instinct of hospitality, but, Virginian as I am, if I had a place, by jingo! there should not be a gate in it— nothing but

A bridge similar to the one described in Bagby's essay.

drawbars twenty poles high, and each pole fastened with ten thousand knots of the strongest, biggest, stiffest, roughest, and hand-tearingest grape-vine I could find. The labyrinth of Crete would be a "main, plain road" compared to my place, and the labors of Sisyphus wouldn't be a circumstance to the labor of getting through it. As for bridges, I wouldn't have one unless it was two hundred years old and half gone when it was first built. A log, a round, slippery log, with the bark off, fastened high up in the crotch of a tall tree on this side, and stuck in the crotch of a still taller tree on the other side of the creek, is a good enough bridge for me. If people want to see me, let 'em swim like Leander, or wade like Cousin Sally Dillard. Maybe I'll have a "cunner" [canoe] for them I like best, but further than that I will not go—no, *I will not*—you needn't ask me.

Many pleasant evening strolls I have had to the old bridge, all by myself, leaning over the bewhittled and name-graven railing, thinking thoughts and dreaming dreams till the evening star arose and the whippoorwill began his chant. But the water under the bridge is not clear as crystal, swift as an arrow, and sparkling as a stream of diamonds—fit abode for Naiads and Undines—but muddy as the telegraphic despatches from Mississippi before the fall of Vicksburg, slow as an army wagon or a conscript making a charge, and full of all manner of nasty and confounded "mud-kittens," "snap'n turtles," and snake-doctors. Still, I love to go there and look by the hour, not at the plague-taked water, but at the pendent vines, the intricate emerald umbrage cut daintily upon the azure ground of the sky, the many-shaped clouds, the ravishing dyes of sunset, and fancying what a great fellow I might be if I only had money enough to quit writing nonsense and stick resolutely to poetry and romance. As you go from George Daniel's—I think I'd better write it Dannill's, that's the way Virginians pronounce the name—as you go from George Dannill's land to Unc' Jim's, the road runs close to the river bank, and through a dense growth of bushes, which, in former years, when the carriage could go on the bridge, and I used to go with Aunt Mary and Cousin Betsy to church, gave us no end of trouble; for if we dodged from one side of the carriage to the other, to keep the intruding branches from scratching our eyes out, we were sure to encounter a set of branches still longer and more insolent, besides skinning our elbows—no small calamity to a body with as plump, fine arms as Betsy's—against the brass buttons by which the carriage curtains were fastened. Unc' Jim never had the address and hardihood to clear up this thicket, or to prune the pugnacious branches. So, Sunday after Sunday we had to run the gauntlet and display our agility in dodging around a space not much larger than the inside of a coffee-pot—for the carriage was a Yankee carriage, as scrimp, meagre, and rickety as the cheap and wretched souls that made it. Woodson, the carriage-driver, when struggling through this bushy maze, used to imitate the most difficult feats of the ancient gymnast or modern India-rubber man of the circus, by tying himself into a double-bow-knot, and placing the top of his head on the bottom of the foot-board, so that only the small of his back and the tips of his knee-pans were visible. Since the "bustid" condition of the bridge has made church-going by the Jackson's mill route impossible, the thicket has been left to its own wild will, and has become as impenetrable as the abattis which Hooker vainly erected in the Wilderness. Well, I am not sorry. Trees, as I said before, are living souls; I love to see 'em grow, and it hurts me to see them destroyed merely to make room for people to pass. Why, I would like to know, can't we treat them as politely as we do other gentlemen of high standing?

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Road-Related Place Names in Virginia

Nathaniel Mason Pawlett

["Backsights" No. 48: originally published in the *Bulletin*, March 1979]

That there are throughout the world various erudite individuals who devote their time to the study of the origin and evolution of place names should not come as a surprise. To learn, however, that there is actually such an organization within Virginia will usually produce a look of incredulity on the face of the listener.

Numbering among its membership both amateurs and professionals, the Virginia Place Name Society has produced a number of publications over the years, its most recent being *Madison County Place Names,* by Douglas W. Tanner (Charlottesville, 1978). Besides its research and publishing program the Society works closely with such organizations as the Virginia Department of Highways and Transportation and the United States Geological Survey.

The continuing relationship between road, rail and water transportation and place names is obvious. That this has ever been the case in Virginia is becoming more and more apparent as research continues on the evolution of our eighteenth and nineteenth century transportation system, and documents yield ever larger numbers of early place names, many heretofore entirely lost to view. A brief talk touching on this subject was delivered to the annual meeting of the Virginia Place Name Society at the University of Virginia on October 14, 1978. What follows is a slightly altered version of the text.

Having been intrigued by Virginia place names for about forty years now, from Taro (Charlotte County) to Vashti (Franklin County) to Chickentown (Charlotte County) to Patti (Franklin County) I still don't recall ever having pursued one to its source until relatively recently. So, on to my bad experience!

About five years ago, while doing some research on an ancestral plantation near the Old Mountain Road in Hanover County, I came across Stone Horse Creek near Rockville. An interesting name, thought I. Gee, I'd like to know how it came by that! After returning to Charlottesville, a perusal of the 1754 Fry-Jefferson Map revealed that this was the name in the eighteenth century too, and not merely a later corruption of Stone House Creek. Such a picturesque name! What could it mean? At this point my imagination *seized* control, producing a vision of a group of Indians worshipping a gigantic stone horse, this vision dissolving to reveal another of an early Virginian explorer standing somewhere along the stream gazing up at a natural rock formation resembling a horse's head. Upon a moment's sober reflection, it occurred to me that perhaps a "stone horse" was really only some device similar to the carpenter's sawhorse which was used by a stonemason plying his trade.

After pondering upon several occasions this unusual name, it finally occurred to me to consult that masterwork of the English language, *The Oxford English Dictionary,* where, after a bit of searching, the definition of "stone horse" was finally located. Devilishly simple, this

definition! Quite simply put, a stone horse is a stallion. My mortification at this discovery may well be imagined. Nevertheless, stone horse was a seventeenth and eighteenth century usage which was still current in Virginia, that museum of the English language, at least as late as 1899 when Bennett Wood Green published the first edition of his monumental *Word Book of Virginia Folk Speech.* It may in fact still be in use in some parts of Virginia. Some of you may be familiar with it, may even have heard your father or grandfather use it at some time.

> [*Image in original:* Section of the Fry-Jefferson Map, showing Hanover County, the South Anna River, and Stone Horse Creek. *Caption:* A portion of the Fry-Jefferson Map showing Stone Horse Creek.]

On another occasion, while travelling that same Old Mountain Road, "up the country" as they would have said in the eighteenth century, I came upon a road in Louisa County which presented another sort of naming problem. This was listed as Pollard's Road on the 1932 county highway map, but according to the late Mr. W. A. Kellar, then the county clerk, 'twas really Paulett's Road or Pollet's Road, later corrupted to Pollard's Road in the local vernacular during the nineteenth and early twentieth centuries. In consulting the local records, it was easy to see that this was what had indeed happened. After the last members of the family left the county about 1800 the name tended to be transmitted only by word of mouth by people living along the road and the original eighteenth century pronounciation of Pollet had been transformed by 1932 into Pollard, although English and informed Virginian pronunciation remains in the style of the eighteenth century.

No doubt many similar cases exist throughout Virginia today. For instance, nearer home still in Albemarle and Fluvanna Counties there exist two streams, both called Ballenger's Creek. Early road orders list a Joseph Barringer in the area of the creek in Fluvanna County but they also use the spellings Barrenger for the creeks, while Mr. Jefferson mentions Barringer's Creek in at least one piece of his correspondence. Nevertheless, both streams retain the Ballenger form in their names. The question is: Was Ballenger really Barringer? Or was Barringer really Ballenger? Are the names interchangeable or what? I wonder what the early land patents would reveal, along with the deeds of the succeeding owners of the property along these two water courses.

Moving on to some of the more unusual place names occurring in road orders and in a road-related context, a number of these come easily to mind: Hardwarr River, so spelled in the early records and *not* Hardware; the Round Pine Slash, a marshy or swampy area covered with brush or scrub timber, in this case pines; Davises, Stockton's and Verdeman's (but no doubt pronounced Vardaman's) thoroughfares, passes or gaps as we would call them today but the earlier English and Virginian term was thoroughfare; various paths and roads but not trails, probably a much later usage which probably fed back here from the American West; a few tracts such as Pouncey's and Clark's, this being the eighteenth century's term for something rather like a trail; and the many taverns and ordinaries cited such as "the Frog Ordinary," the "Old Rolly" (Rawleigh), "the Negro's Arm," and so on ad infinitum.

The publication of early road orders has greatly increased the accessibility of many early place names used as points of reference in them. From those several decades immediately

following the threshold of settlement in each area of Virginia many more will shortly be coming to light, as more and more volumes of the early land patents are indexed and published by the Virginia State Library, and we are enabled to explore the correspondence between Indian path, colonial road, turnpike and modern highway. Although this correspondence is the accepted traditional view of the development of Virginia roads, this writer suspects that a detailed examination will ultimately reveal an even closer correlation than has previously been believed to be the case.

These investigations should also turn up some more very interesting terminology directly relating to roads themselves and their attendant technology. From William Byrd we already know that by 1732 there were thirteen miles of the road from Germanna to Alexander Spotswood's iron mines which had trees with the mileage marked upon them at intervals of one mile. These numbers may have been incised, painted or both incised and painted. We know that by 1737, five years later, the Three Notch'd Road (although then still called the Mountain Road) had mileage markings along its length from the D.S. Tree just west of the present Charlottesville down toward Richmond. Since the D.S. Tree is mentioned and also the Twelve Mile Tree somewhere near Shadwell, it seems likely that these mileages were also incised upon trees. D.S. would seem to have been the "0" marker and road orders mention the numbers 18, 22, 26, 30, 32, 36, 40 and 46. This last one would have been located in Goochland County somewhere near the budding village of Richmond and would have indicated to the west-bound traveller the number of miles "up the country" to the D.S. Tree, where the road forked with one going to Wood's Gap and the other to Rockfish Gap, both in the Blue Ridge or Blue Ledge or Great Mountains, to cite several alternate forms of the name then in use.

The first mention of these numbered markers occurs in 1737, following the tour of Peter Jefferson as surveyor of this road, which ran by his plantation, Shadwell. That the Germanna markings served as the example for this seems likely. Both of these seem to have been part of a developing trend in Virginia for, the very next year, 1738, an act of the Assembly directed that road signs be erected at intersections, stating "the most notable place" to which each of the intersecting roads ran. This act, reiterated many times in the ensuing years, gave rise to a host of place names across Virginia variously called the Sign Post, Sign Rock (Halifax County) or Sign Board. Similarly the marking of the Mountain Road by three notches in 1742 shortly changed its name into "Three Notch'd Road." The Indian Road through the Valley of Virginia also received a marking by "two Knotches and a Cross" in 1745, but the name seems in this case not to have stuck although surviving early records may someday indicate the contrary. All of these names came into use soon after settlement began in this area and some of them should turn up in the land patents for this area when they are finally published.

Later on, of course, the nineteenth century's turnpike, canal and railroad construction movements, and the later attendant proliferation of post offices would produce a plethora of often externally imposed and sometimes frivolous place names which were also road-related. But these later names will, I think, somehow always lack the charm and interest of those which grew out of the years immediately following the threshold of settlement as early Virginian road development kept pace with the movement into Piedmont and Southside Virginia.

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A Unique Survivor: Virginia's Fink Truss

Howard H. Newlon, Jr.

["Backsights" No. 49: originally published in the *Bulletin,* April 1979]

The development and exploitation of wooden and metal truss bridges were predominantly products of American engineering technology. Following Ithiel Town's patent, granted in 1820, for an all timber "Lattice truss," patents were issued for numerous configurations bearing the names of American engineers such as Whipple, Howe, Pratt, Bollman, Fink, and Thacher. Improvements proposed by these men were essentially directed toward spanning the longest possible distance with the least amount of material. The requirement of the railroads for long spans to carry increasingly heavy loads was a dominant factor in promoting developments of the truss form.

Despite the suggestion of infinite variety in truss designs, after the U.S. Civil War, 90 percent of the trusses built were, according to the noted bridge authority J. A. L. Waddell, by either the Pratt or Whipple system.

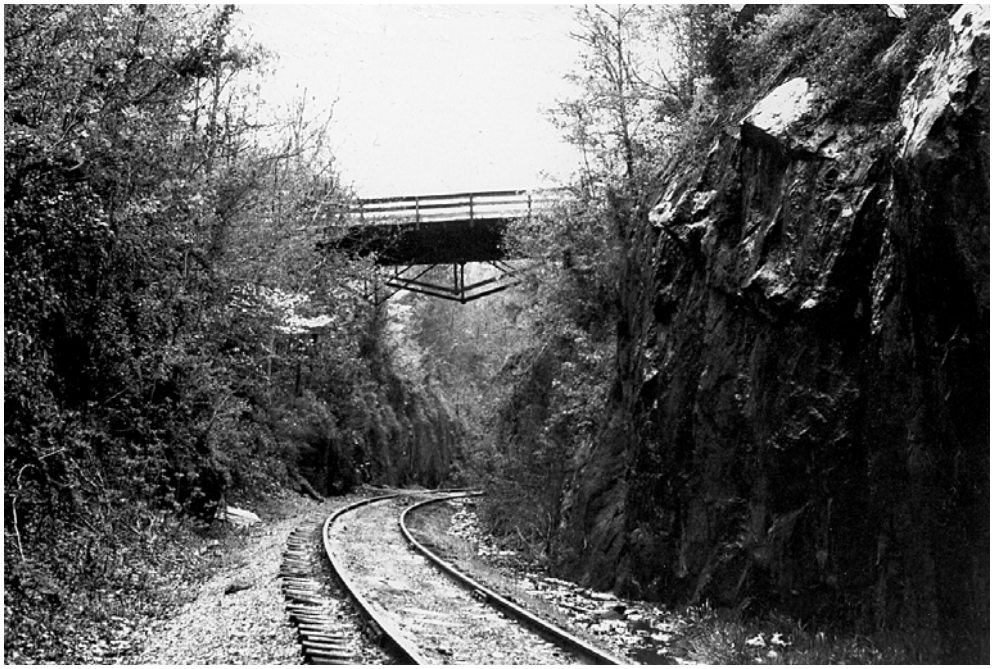
During the mid-1880s, steel began to replace wrought and cast iron as the preferred material and, for the most part, since the beginning of the twentieth century, the majority of steel trusses have been relatively standard except for unique situations requiring custom designs.

Among the systems proposed during the mid-nineteenth century was one by Albert Fink, to whom Patent No. 10,887 was granted May 9, 1854. The diagram accompanying Fink's patent included both a deck and through truss.

The Fink configuration was widely utilized for railroad bridges, including large structures such as the Green River Bridge south of Elizabethtown, Kentucky, and the 14th Street Bridge across the Ohio River at Louisville, Kentucky.

Despite the popularity of Fink's truss, according to Waddell, none were built after about 1875, primarily because of excessive vibrations. In effect, the Fink truss became extinct. But amazingly one survives and continues to carry approximately 10,000 vehicles per day in Lynchburg. This bridge is shown in the accompanying photograph carrying Route 291 (Old Forest Road) over a siding of the Norfolk and Western Railroad in Lynchburg. Based upon inquiries to a variety of authorities, this appears to be the only known surviving Fink deck truss in America. A Fink through truss is located near Harnden, New Jersey. It was severely damaged in 1978 and attempts to resurrect it are being made.

The Virginia Fink truss with a span of 52' 6" was placed at its present location in 1893 when the main line of the Norfolk and Western was relocated. This section, designated as the Halsey Spur, now serves as a siding for the Lynchburg Ready Mix Plant. The truss consists of tension, vertical, and diagonal members of wrought iron, while the top chord, supporting bents



The Fink Truss ***[NOTE: in its 1890s location on Route 291 (Old Forest Road)].***

and floor systems are of wood. The upper chord is apparently untreated oak, about 14" by 15" in size.

A drawing of the 1893 relocation located by Ed Bond, bridge engineer of the Norfolk and Western, is of importance to explaining the history of the truss. Not only does it contain a sketch and dimensions of the truss but also presents a bill of materials, which is important since only wood and incidental metal parts are listed. There is no mention of the truss. This is strong evidence that the truss already belonged to the Norfolk and Western and was moved to the present site from some other location, probably on the main line. Thus, there is a high probability that it originally was part of a railroad structure. This would be consistent with the fact that by the 1890s Fink trusses were considered inadequate for the existing railroad equipment. The exact date of original construction has not been determined but can be reasonably estimated as circa 1870 from circumstantial evidence described below.

The Norfolk and Western Railroad was formed in 1881 by the combination of the bankrupt Atlantic, Mississippi, and Ohio line that ran between Norfolk and Bristol and the Shenandoah Valley Railroad. The Atlantic, Mississippi, and Ohio had been formed in 1870 by General William Mahone, who combined three existing roads: the Norfolk and Petersburg, the Southside (between Petersburg and Lynchburg), and the Virginia and Tennessee (between Lynchburg and Bristol). The current location of the Fink truss is within the original limits of the Virginia and Tennessee section. The Atlantic, Mississippi, and Ohio went into receivership in 1874.

On the assumption that the truss dates from about 1870, the reports of the Virginia and Tennessee (between Lynchburg and Bristol) to the Board of Public Works were reviewed. This section was opened during the period 1850-1856. These early reports deal mostly with route surveys, etc., west of Lynchburg, and there is no mention of the bridge. A University of Virginia

thesis on the Norfolk and Western by Thomas in 1925 and a series of articles by Helvestine in the 1923 *Norfolk and Western Magazines* refer to wooden bridges until the flood of 1870, when iron bridges are mentioned. Helvestine's article on the Southside includes an undated sketch of a large Fink truss at Petersburg. Copies of the Atlantic, Mississippi, and Ohio's Report to Stockholders were secured for the years 1870-74.

While these reports reflect a comparatively high level of Fink truss usage, none conform to the dimensions of the Lynchburg span. There was another significant flood in 1877. No reports of building at this date have been found. This was during the hiatus between the Atlantic, Mississippi, and Ohio and the Norfolk and Western.

The circumstantial evidence to date suggests that the bridge was moved in 1893, probably from a main line of one of the railroads then making up the Norfolk and Western. It could have been built as early as the 1850s, but more probably, about 1870.

In addition to its status as a unique survivor of an important truss type, the truss has personal ties to the inventor, Albert Fink. Although no published biography of Albert Fink exists, references in ASCE's *A Biographical Dictionary of American Civil Engineers*, the "Memoir of Albert Fink" in the 1898 *Transactions of the American Society of Civil Engineers*, and information supplied by Professor Emory L. Kemp, permit a brief sketch of this important American civil engineer.

Albert Fink, along with his brother Henry, arrived in Baltimore from Germany in 1849. He was initially employed by the Baltimore and Ohio as principal assistant to Benjamin Henry Latrobe II, along with Wendel Bollman. The Fink truss was adopted by Latrobe for all bridges on the Baltimore and Ohio Railroad and the Parkersburg Branch. Fink was resident engineer on the construction of the Parkersburg Branch from 1853-55, and from 1855-57 was construction engineer for the Norfolk and Petersburg Railroad (later a part of the Atlantic, Mississippi, and Ohio). In 1857 he joined the Louisville and Nashville, where he remained and served as its vice-president from l870 to 1875. From there he became commissioner of the Southern Railway and Steamship Association, a "pool" of the southern railroads for regulating rates and controlling traffic. He retired from professional life in 1888, and died in 1897 at the age of 70. In addition to his railroad activities, he served as president of the ASCE from 1879 to 1880.

Henry Fink was master of transportation when General Mahone consolidated the Norfolk and Petersburg, Southside, and Virginia and Tennessee into the Atlantic, Mississippi and Ohio in 1870. When the Atlantic, Mississippi and Ohio was bankrupted in 1874, Henry Fink was appointed receiver. He later became president of the Norfolk and Western that grew from the reconstructed Atlantic, Mississippi and Ohio in 1881. Thus, a significant relationship exists between Fink, his brother, and the bridge located in Lynchburg.

Efforts will be continued toward trying to document the date of construction and original location of the truss. But its uniqueness derives from the structure itself and its association rather than its exact age and original location.

The structure is scheduled for replacement in about three years. Since the bridge is not at its original location, and because the deck truss is not currently visible, except from below, on account of the steep cut, its retention at its present site is not warranted. Some special adaptive use or museum location is being sought by a task group of the Research Council's History Research Advisory Committee.

The History and Heritage Committee of the ASCE has recommended this structure as a National Historic Civil Engineering Landmark and Board of Directors' approval is expected in April.

Thus this structure, which has served rail, carriage and automobile traffic for more than a century, is an amazing survivor that deserves recognition for a job well done.

[NOTE: In 1979, the Fink deck truss described in this article was formally designated a National Historic Civil Engineering Landmark by the American Society of Civil Engineers. The bridge was moved from its site over Route 291 (Old Forest Road) and re-erected as a footbridge in Riverside Park in Lynchburg in 1985.]

The Phoenix of the Old Dominion

Howard H. Newlon, Jr.

["Backsights" No. 50: originally published in the *Bulletin*, May 1979]

The last half of the nineteenth century in Virginia is often characterized in terms of either the restrictive and severe moral code referred to as "Victorian" or of the destruction and desolation of the Civil War. In spite of these generally accepted views of the times, the period was also one of extraordinary advances in technology and industrial growth that have greatly influenced the way we live today. From this point of view, perhaps no other period of technological development has been more important.

Consider, for example, the following progression of patents: telephone—1876, electric light—1880, linotype—1886, and motion pictures—1889. Only a generation earlier, in 1857, Otis had patented his elevator that was to change the skyline of America. Petroleum had been discovered in Pennsylvania in 1859, an event that ultimately would revolutionize transportation.

Naturally, there were enterprising people available to exploit these inventions, and their efforts resulted in the creation of the great industries and the tremendous fortunes that we associate today with the names of Rockefeller, Vanderbilt, Mellon, and Gould. Transportation, particularly the advent and growth of the railroads, was an important part of the nation's industrial development. In Virginia, the date of June 1, 1886, is especially important since on this day in a Herculean operation of planning and cooperation the various gauges of all the railroads were converted to a single standard gauge. Previously, transfers and unloadings had been required where roads of differing gauges connected. After that date, goods and people could travel across Virginia without these delays and inconveniences.

During the period following the Civil War, Virginia was an important part of the projected industrial growth of the "New South." Much credit for the interest in industrial development and its resulting financial speculation in Virginia can be given to Jed Hotchkiss, who became famous as General Stonewall Jackson's map maker. After the War, Hotchkiss began publication of *The Virginias* in Staunton. This paper extolled the mineral resources of the two Virginias, emphasizing particularly the numerous iron and other mineral deposits in these states.

Promoters recognized that land speculation was the fastest way to amass a fortune, and land and improvement companies sprang up in town after town. The boom was on! Spurred by Hotchkiss's glowing reports, this boom was particularly active in the Valley of Virginia. During the brief period between 1889 and 1893 it rose, peaked, and finally collapsed.

Old towns expanded and new cities were created; others were renamed to reflect the new industrial image. Waynesboro Junction became Basic City, and Williamson became Clifton Forge. Buena Vista was created from converted farmland, complete with electric lights where busy streets would soon be located. Bessemer, at the confluence of Craig Creek and the James

River in Botetourt County, was situated to tap the numerous iron mines between Eagle Rock and New Castle.

Plats, pamphlets, papers, and a variety of promotional paraphernalia appeared everywhere as lot auctions became almost daily occurrences. These auctions were usually begun by distinguished orators who extolled the advantages of the town. These orators were followed by veteran auctioneers. If the sale was successful, the promoters would realize huge profits, and the news would quickly spread to another location where the process would soon be repeated.

Typically, the promoters erected large hotels, laid out streets, and established a land office. Some of the hotels were enormous. Royster Lyle, in an article in the Winter 1971 issue of *Virginia Cavalcade*, describes the hotel in Buena Vista, the Rockbridge Hotel in Glasgow, the De Hart Hotel in Lexington, and the Palace City Hotel in Goshen. Most of the hotels, being constructed of wood, were subsequently destroyed by fire. Others were demolished. Two survive on school campuses: one at Southern Seminary in Buena Vista and the other, the hotel from Basic City, at Fairfax Hall in Waynesboro.

Once the hotels were built, the promotional activities increased and descriptions emphasizing either the industry or beauty of the city appeared in such terms as "bustling Brownsburg," "coming Cornwall," "bonny Buena Vista," and "ravishing Radford." The expected success of Virginia's cities even led to them being the standard for comparison. Roanoke dubbed itself the "Birmingham of the Old Dominion," while West Clifton Forge called itself "a second Roanoke" or the "Altoona of the South." Other cities were described as "pushing Basic City." Naturally, such industrial centers required more spas for the relaxation of their capitalists, the existing springs notwithstanding. Wytheville assumed this mantle, describing itself as "the Saratoga of the South." No extensive study of these cities has been made, but Stuart Sprague has discussed those in the Valley region in an article in the Winter 1975 issue of *Virginia Cavalcade*

The accompanying photographs of Buena Vista from the archives of the Virginia State Library illustrate the development between 1890 and 1891. A close examination, however, discloses that many of the buildings in the 1891 view were added by an artist.

> [*Images in original:* Buena Vista in 1890 and 1891. *Caption:* Buena Vista in 1890 / Buena Vista in 1891. Promoters used pictures such as these to reinforce their written description of a boomtown's growth. An artist added pictures of the buildings in the 1891 photograph (right) to accentuate Buena Vista's development.]

Some of the promise and high hopes for these cities was founded in fact, because there were already numerous iron furnaces in operation in the Valley of Virginia. The successful development of Roanoke was often cited as an example of what could be done. But for the most part, the boom fed upon itself as town after town seeing its neighbors in the midst of apparently unlimited growth followed suit.

The boom was not limited to the Valley of Virginia as evidenced by a town plan and promotional literature advertising Claremont in Surry County. The plan, published by the Citizen's Land and Development Company in 1900, showed an impressive array of residential and business lots. While the area was not possessed of the rich mineral resources of the Valley, it had an ambitious plan for growth which was advertised in 1896.

> First we want a factory to work up our hardwood timber.
> Second we want a cotton factory
> Third we want a silk factory
> Fourth we want a shoe factory
> Fifth we want a shirt factory
> Sixth we want a carriage and wagon factory
> Seventh we want a berry basket and butterdish factory.

The verbal imperatives of the promoters were typically those of the *Claremont Resort* during the period 1896 through 1915, which became progressively intensified. One read: "To get ten acres or more of Claremont Farms you must buy today. Tomorrow may be too late. He who hesitates is lost, as Claremont Farms are going fast. Do not delay. The first applicants get the first and best choice. A wait of a day or a week may leave you out entirely."

Buyers were warned to be sure that they reached their destination and were not distracted en route by some other developer who would "sell his grandmother's grave in order to get a commission."

No comprehensive listing of these boom towns has been compiled, but almost every locality has within its court records ambitious plans by one or several land and development companies during this period. Among those for which plans or buildings survive are Basic City (now part of Waynesboro), Buena Vista, Glasgow, Carnegie City (Elliston), Clifton Forge, Iron Gate, and Goshen.

The boom was recorded and promoted by a widespread booster press with newspapers that revealed their purpose through names such as *The Basic City Advance*, Buchanan's *Virginia Manufacturer, The Buena Vista Advocate, Clifton Forge Nonpareil,* and Shenandoah's *Argus.*

Such speculations were not new to America. Charles Dickens, after his American tour, included an incident in his novel *Martin Chuzzlewitt* in which Martin became an unwitting partner in the Eden Land and Development Company, complete with grand plans and maps, but little actual construction.

Despite high hopes and great promise, events conspired to prevent the expected bonanza in the Commonwealth. The financial panic of 1893, the opening of the Mesabi iron ore deposits in Minnesota, and other factors brought an end to this interesting part of Virginia's history. A few artifacts survive, including city plans, hotels, some industrial buildings, and at least one metal truss bridge. This bridge, built by the Goshen Land and Development Company and complete with its ornamental plate listing the officers of the company, was recently placed on the National Register of Historic Places. But these are a small portion of what was envisioned by the unlimited enthusiasm of the builders of Virginia's dream cities.

If Sheridan left the Valley so desolate that “a crow would have to carry his rations,” the developers thought in terms of another bird, the Phoenix of Arabian mythology, which rose from its own ashes. Unfortunately, the resurrection was short lived, as will become apparent in the story of the proposed city of Bessemer in Botetourt, which will be the subject of next month’s “Backsights.”

A Boulevard for Bessemer

Barbara E. Hensley

["Backsights" No. 51: originally published in the *Bulletin*, June 1979]

[NOTE: At the time this article was written, Barbara E. Hensley, the author, was a Graduate Assistant at the Virginia Highway and Transportation Research Council, now the Virginia Center for Transportation Innovation and Research.]

Nearly a century after it was originally conceived, construction of a wide boulevard is nearing completion in the city of Bessemer. This is not the well-known city in Alabama, but rather the relatively unknown Bessemer, Virginia, one of the many "boom towns" planned for the Valley of Virginia in the late nineteenth century.

[*Image in original:* Site of Bessemer. *Caption:* A present day [1979] view of Bessemer in the vicinity of 13th and Delaware Streets.]

The current reconstruction of Route 220 along the James River in Botetourt County is unintentionally completing part of a plan that itself was part of the phenomenal growth boom from 1889 to 1893 in the Shenandoah Valley. This boom was a response to the South's need for economic recovery from the devastation of the Civil War, and it took the form of industrial growth based upon the mineral resources of the Valley, especially iron. Early in the boom, land speculators and promoters recognized an opportunity to amass fortunes and, accordingly, established land and improvement companies which expanded existing towns and created new ones. The success of each scheme fed the next, and the boom reached enormous proportions during the four years it took to run its course.

[*Image in original:* City plan for Bessemer. *Caption:* The city plan for Bessemer, 1890.]

One of the quiet reminders of the Shenandoah Valley boom is a town called Bessemer, which is tucked in the foot of the mountains near Eagle Rock in Botetourt County, where Craig Creek flows into the James River. Bessemer was sited to take advantage of the iron deposits in the Craig Valley, but even the mines have long since shut down. Today all that remains of Bessemer is a cluster of homes, a few abandoned structures, and the foundations of several others.

The idea for a bustling town called Bessemer was conceived as early as 1884, when the Craig Company was granted a charter allowing it to construct a railroad, mine iron ore, and lay out a town. As was the case in so many of the boom town schemes, the charter members of the company were a carefully chosen group of Northern financiers, successful local farmers and businessmen, and railroad men. One of them, Edward Dillon, had been active for a number of years in Botetourt County and had been a charter member of the Botetourt County Improvement Company just four years earlier. W. A. Glasgow was well known for the promotion of the boom

town of Glasgow, which bears the family name. Samuel Coit, of Hartford, Connecticut, was a very successful promoter of mining lands and a member of the board of directors of the Chesapeake and Ohio Railway Company. H. C. Parsons was also a member of the C&O board. In fact, a number of other charter members were from Ohio and West Virginia and were probably involved with the C&O.

One of the most interesting charter members of the Craig Valley Company was Joseph R. Anderson, president of the Tredegar Iron Works in Richmond, which owned and operated the iron furnaces at Clifton Forge and Buena Vista. Iron from the Craig Valley was taken to these furnaces for processing. Possible Anderson family connections seem to have played an important part in the selection of the site for Bessemer and its subsequent promotion, for in addition to Joseph R. Anderson, W. P. Anderson, of Cincinnati, was on the board of directors of the C&O. Approximately half of the land planned for Bessemer had been owned by the William Anderson (d. l812) family since at least the early 1800s. J. D. Anderson was the secretary-treasurer of the Buena Vista Company, and one of the Andersons was active in the East Clifton Forge Land and Improvement Company. These Andersons almost certainly had to be related. What other explanation could there be for so many Andersons having been involved in so many related activities?

With this impressive list of railroad men entrepreneurs, the Anderson family connections, and with the news, sometimes exaggerated, of the enormous successes of such towns as Buena Vista, Clifton Forge, Glasgow, and Basic City, the Craig Company began laying out Bessemer, and by November 1890, the plan was recorded in the Botetourt County deed book. The plan covered a 400-acre area and was composed of 34 streets and 110 blocks, making the town approximately half the size of Buena Vista. Special features of the Bessemer plan included the grand 80-foot wide Boulevarde along the James, the 100-foot wide Melrose Avenue, 1,000 residential lots and 1,000 business lots, and the Hotel de Bessemer. Every inch of usable space in Bessemer was assigned a business or residential use. Sometimes even land that was not usable was included, as close inspection of the linen plan in the Botetourt County Courthouse shows. Plats were inked in right up the sides of the mountains, only to be erased later when on-site inspections showed that the land was too steep for housing. Even the smallest leftover triangular parcel of land was given block numbers.

As in so many of the boom town schemes, it was believed that the more lots offered for sale, the more convincing the scheme would appear on paper and the more likely it would be to attract potential land speculators. Bessemer's 1,000 business lots and 1,000 residential lots indicate that it was planned as a speculating town. How else, but for speculation, could as many business as residential lots be explained in a town of Bessemer's size?

Leftover parcels of land along the railroad were reserved for industries or for C&O use. Indeed, it was the C&O that opened up the Craig Valley for development when it began construction of the Craig Valley Branch in 1889. This spur crossed the James River on an unusual trimodal metal truss bridge that also served to usher people across the James and into Bessemer. The bridge, shown in the accompanying photograph, carried C&O mining trains through the middle, carriages, wagons and later automobiles on the cantilever to the right, and

pedestrians on the cantilever to the left. Once across the bridge, one entered the town of Bessemer.

[*Image in original:* The bridge near the site of Bessemer. *Caption:* The trimodal bridge, gateway to Bessemer and the Craig Valley.]

The plan for Bessemer is similar to that of Basic City, now part of Waynesboro, with Chesapeake Avenue on one side of the railroad and Ohio Avenue on the other, and a gridiron pattern modified only where topography dictates. Perhaps sample town plans were available from the railroad companies, which, with the necessary modifications in scale and geometry, could be made to fit any site. This seems to be the easiest way to explain Bessemer's 100-foot wide Melrose Avenue, which neither connects any of the parts of the plan nor separates any. It begins at the Boulevarde and comes to an abrupt end at the mountain forming the western edge of the town.

After planning the town and recording it in the county deed book, the next step in successfully establishing a boom town was to publish a promotional map to attract investors, especially investors from the North. Clearly the Craig Valley Company expected investors from all over, but especially from the North judging from the black and white location map in the upper left-hand corner of the promotional plane. The map covered an area extending from New York south to Virginia and west to Ohio. In the center in large, prominent red letters was the key word: Bessemer.

Finally, since the moment of truth for all of the boom towns came at the great lot sales, Bessemer's streets were laid out and graded, and blocks were divided into plats. Even a hotel was constructed to make ready for the sales. These investments were nominal, however, when compared to the profits expected from the sale.

By October 1891, 147 lots had been sold for a total of $13,259.71. On the other side of the ledger, $3,862.79 had been spent on permanent improvements and an additional $778.45 on buildings. When all of the receipts and disbursements were accounted for, $53,005.11 had been received from stock and $17,026.53 from real estate; assets totaled $43,688.68 and liabilities $36,525.00. The company was off to a healthy start!

A brick and tile company, a mill, a general store, a hotel, a post office, and a lawyer's office operated in Bessemer, and the town had a population of 25 by 1906. The Oriskany Mine became the greatest iron mine in the state, producing 1,000,000 tons of ore at a rate of 400 tons a day. Perhaps Bessemer would have achieved its goal had the panic of 1893 not caused the venture to collapse.

Even today lots are still changing hands in Bessemer, but let the buyer beware! The town that is so neatly planned on paper is just that, a paper town. Roads that were once graded are now only faint impressions in fields, making many lots inaccessible to today's unwitting buyer who knows nothing of the excitement and promise of land speculations of the last century. Perhaps the best reminder of the 1890 plan for Bessemer is the rerouting of Route 220 there. Today, almost 100 years after the Bessemer promotion, the Department of Highways and

Transportation is constructing the spectacular “80-foot wide Boulevarde” along the James River almost exactly where it was originally planned.

Dawsons, Piedmonts, and Klines: Auto Manufacture in Virginia

Howard H. Newlon, Jr.

["Backsights" No. 52: originally published in the *Bulletin*, July 1979]

Note: Most of the information in this article has been taken from the two references cited. These publications were supplied by Robert W. Ainsworth, of Portsmouth.

Mention of the names Ford, Chrysler or General Motors instantly evokes an image of Detroit's huge factories and of the various vehicles that are a vital part of the world's economy and lifestyle. Mention the names Dawson, Kline or Piedmont, and the response would probably be a blank stare. But there was a time during the first quarter of the twentieth century when these names were also a part of the U.S. automobile industry, and they were of particular interest to Virginians since each was the name of an automobile manufactured in the Old Dominion.

The industrial revolution and expansion that was anticipated for the South following the Civil War have been, in part, described in two previous "Backsights" articles. By the middle 1890s, economic factors had for the most part ended the grandiose plans for "Altoonas of the South" and other such visionary projections, but vestiges of these attempts at industrial development continued into the twentieth century in activities, such as automobile production, that today are far removed from Virginia.

J. Frank Duryea, of Springfield, Massachusetts, is generally credited with building the first gasoline-powered automobile in the U.S. Duryea's car was given a short road test in September 1893, three months before Henry Ford and his wife, Clara, tested his gasoline engine on their kitchen sink in Detroit. Others, with names like Olds and Winton, recognizing the potential of this new "horseless carriage," began to manufacture vehicles, often as a sideline to an already successful business in items such as bicycles, carriages or electrical supplies. The potential of this new technology was not lost on Virginia entrepreneurs.

Credit for the first automobile manufactured in Virginia apparently goes to the Dawson Manufacturing Company, of Basic City, Virginia. Developed across the South River from Waynesboro, Basic City was one of the Valley boom towns. Dawson had a machine shop in the Penn Foundry and Car Works of Basic City, and early in 1900 he began construction of a steam-powered vehicle designated the Dawson Auto-Mobile. An advertisement appearing in *Cycle and Automobile Trade Journal* in March 1901 described the vehicle in detail, noting that three persons of ordinary size could ride comfortably at speeds of 25 to 30 miles per hour on fair roads. The engine was made of brass, and the vehicle carried a gas tank holding eight gallons and a water tank of 25-gallon capacity. At the time this ad appeared, there were about 14,000 automobiles registered in the U.S., and about 7,000 more were manufactured in 1901. Three of the companies built electric cars, five produced steam cars, and the rest gasoline-powered vehicles.

Dawson sold his car to Luther Gaw, who was a mechanic, and John Clark. Apparently this was the only Dawson car ever built and sold. An article in the *Waynesboro News-Virginian* in 1944 noted that local investors chose to put their money in "salted" oil wells rather than the untried motorcar.

Undoubtedly the most successful of Virginia's automobile manufacturers was the Kline Motor Car Corporation, developed by James A. Kline in Richmond. In 1889 Kline, a 22-year-old native of Pennsylvania, was attracted by an advertisement from the Locomotive Company of America, announcing a demonstration of its new steam vehicle in New York City. Kline attended the demonstration, which was judged a success based upon a drive of three blocks without a breakdown.

Convinced that there was a future in steam cars, Kline attempted to purchase one and succeeded in having priority number 11 assigned to him. Ultimately Kline, who was then living in Harrisburg, sold vehicles produced by the Locomotive Company of America, made improvements to them and, in 1900, began manufacturing a steam car of his own design. In 1905 he moved to York, Pennsylvania, and expanded his dealership to include Olds and Pullman cars. In 1909, along with two associates, he formed the BCK Motor Company and delivered the first Kline Kar in 1910.

Following the practice of other early auto manufacturers, the BCK Company built cars for racing and its cars won many trophies. Then as now, innovations were first tested on the dirt racing tracks of the U.S.

The reputation of the Kline Kar attracted the attention of a group of Richmond business men, and, on April 21, 1911, the State Corporation Commission approved the organization of the Kline Motor Car Corporation. Manufacture continued in York while a plant was being constructed on a 15 acre tract on North Boulevard in Richmond. The building, housing the plant shown in the accompanying photograph, was subsequently remodeled, and today it is part of the W. G. Cosby Transfer and Storage Company. The factory was unique in its construction, which resembled a squared letter U, with railroad tracks on the inside flanked by parking areas for preliminary testing.

[*Image in original:* Early photograph of the Kline plant. *Caption:* The Kline Automobile Plant on North Boulevard in Richmond, as it appeared about 1914.]

Based upon his experience with Pullman, Kline developed a large line of models with emphasis on what would today be called "luxury cars." The prices of the Pullmans ranged from $1,200 to $2,800 about 1905 when the average daily wage for the laboring man was less than two dollars. During the period 1912 to 1921, Kline's lowest priced car sold for $1,095 and its highest, the Model 6-55, sold for $2,265 in 1921. The company's first advertisement appeared in the *Richmond Times-Dispatch* on February 25, 1912. This was one of the earliest illustrated ads used in the paper.

When production of the Kline began in Richmond in 1913, its 1,000 cars represented about two-tenths of one percent of the total U.S. production. By 1917, 1,399 Klines were

produced but the market fraction had dropped to about one-twentieth of one percent of the total U.S. output. This reduced share of the market reflected the increasing concentration of car manufacture in Detroit as a result of Ford's mass production techniques. Kline recognized the changes that were taking place in the industry, but there was little that a small independent manufacturer could do. By 1921 Ford produced 63 percent of the entire industry output and had reduced prices by $150, while others had been forced to raise prices. In 1922, when many automobile companies were going into receivership, Ford showed a profit of $119 million. In 1924 the charter of the Kline Motor Car Corporation was revoked for failure to pay registration fees of $200 for the years 1922 and 1923. The demise of the Kline Corporation reflected the triumph of Ford and the other Detroit companies over the small manufacturers.

[*Image in original:* Kline touring car. *Caption:* The 1921 Kline Model 6-55, five passenger touring car, was billed as "the ideal family touring car." In addition to the normal seats, it was equipped with auxiliary seats for two more people.]

James Kline continued his love affair with the automobile, however, as he became managing director of the Automobile Club of Virginia. He was also president of the Virginia Automotive Trader Association until his death in 1944.

The third automobile to be built in Virginia was the Piedmont, which was produced in Lynchburg from 1917 until 1923. The factory, at the present site of the Kerns Bakery, of Lynchburg, consisted of three large shed buildings. The beginnings of this factory are somewhat uncertain, but apparently a Mr. Shiner from Detroit and a Mr. Driver from North Carolina came to Lynchburg in 1915 and aroused public interest in automobile manufacture. They apparently left and faded into obscurity after the shares were sold and production was begun in 1917.

Piedmont was a small enterprise that produced two models, one selling for $1,095 and the other for $1,700. The company sold about 1,500 cars in 1920 and was to some extent an assembly rather than production plant, since components were imported from various points and assembled to make the completed car.

Bodies were made at Lynchburg, however, and in fact, were supplied to assemblers in other locations. No large stamping machines were available, and the bodies were hand-formed by a Swedish sheet metal expert named Sapella, who contracted for the work at one dollar per body. The bodies were made from panels beginning as a sheet of metal 45 by 84 inches, which was hammered by hand over a wooden form. Even the double compound curves in the rear section were formed in this manner. Sapella and two assistants, who were primarily "holders," could turn out about three thousand body panels in two weeks. Lynchburg was only one stop for Sapella and his itinerant crew.

The assembling operation produced about five or six cars per day. In addition to the Piedmont, the company manufactured automobiles for other companies. One, the Lone Star, was located in Texas. In supplying models to Lone Star, the Piedmont Motor Company manufactured its regular line and attached an enamel Lone Star to the radiator shell prior to shipment. A similar arrangement was made with the Bush Automobile Company in Chicago. There was even an Alsace, which was produced for sale abroad during 1920-21. The only

modification necessary was the movement of the steering column to the right side to accommodate European practice.

Like the Kline Motor Car Company, Piedmont suffered serious reversals about 1921, and its end is clouded by questions concerning issuance of stock without evident expansion of facilities or production. The company went into receivership in October 1923. Toward the end of operations, it built 300 one-and-a-half-ton trucks and made two pilot model Kerosene tractors similar to those being produced by Ford.

Compounding the problems of competition from Detroit, the Piedmont Company was saddled with a large inventory of parts. The receivership documents indicate an inventory of parts valued at $225,000, a huge sum to be tied up in such a competitive business.

While nothing is known of the company, the Norfolk *Virginian-Pilot* of March 1973 contains a 1924 picture of the car No. 2 made by the Robe Motor Company at a factory in Nansemond. The Robe offices were in Norfolk. Robe apparently suffered the same fate as Kline and Piedmont.

Just as opening the Mesabi iron deposits signaled an end to the iron mines of the Valley, Henry Ford's genius in exploiting mass production in Detroit doomed the small manufacturers across the U.S., which were estimated at more than 2,000 in 1923. In some degree the failure of automobile manufacture rang down the curtain on a 50-year effort to industrialize the South. While industrial development in Virginia and throughout the South has continued, it has not attained the magnitude envisioned by the nineteenth-century promoters.

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A. G. Bradley's Old Bethel Pike

Nathaniel Mason Pawlett

["Backsights" No. 53: originally published in the *Bulletin*, August 1979]

Nineteenth-century internal improvements were not always unmixed blessings. Sometimes they backfired upon their projectors due to unforeseen problems or the lack of constant, careful maintenance. Particularly was this the case when they were not properly maintained. While this lack of maintenance was often a problem during the antebellum period, after 1865 it reached overwhelming proportions due to the straitened financial condition of the state and its citizens. Railroads were able to attract northern capital and rebuild, but the turnpikes and canal companies were characterized by a state of constantly increasing desuetude. Within a few years many of the turnpike companies were out of business and their turnpikes had reverted to the status of county roads. Maintenance quickly became either minimal or else non-existent and the roads rapidly fell into the category of hazards to be avoided by the wary traveller. At the extreme, these roads came to be avoided altogether and traffic took to the fields on either side or else returned to using the old roadbeds that had been replaced by the turnpikes if they were still passable. The excerpt below and the accompanying picture of the road describe just such a situation and provide an object lesson in the importance of constant maintenance of road surfaces, a lesson which has not been lost upon modern highway engineers.

Arthur Granville Bradley (1850-1943) was a well-bred Englishman who came to Virginia in the years following the conflict of 1861-65 and lived near Lynchburg for a few years, before returning to England for a long career as a writer of histories and travel books.

[*Image in original:* Photograph of A. G. Bradley. *Caption:* A. G. Bradley.]

During his residence here, his fascination with Virginia led him to produce a series of composite sketches of Virginian locations and characters. These he sold to such English magazines as *Macmillan's, Blackwoods,* the *Badminton,* and the *Fortnightly Review.*

In 1897, a number of the best of these were published as a book called *Sketches from Old Virginia.* Reminiscent of the work of George W. Bagby, these perceptive sketches have remained a staple of Virginians. Indeed, the *Virginia Historical Magazine's* 1898 reviewer of the sketches said that he would "venture to predict that as time goes on they will be considered to have very great historical value . . . Mr. Bradley is an Englishman and a foreigner, but not [even] the lamented Bagby was more tenderly appreciative of the humorous and touching sides of old Virginian individually than he is . . . In the article "On the Old Bethel Pike," there is crowded all the graphic details of the great changes which have taken place in the agricultural aspect of old Virginia as well as in her homes . . ."

"On the Old Bethel Pike" describes the decaying condition of east Virginian plantation society in the 1870's and 1880's. Bradley employed the fictional "old Bethel Pike" as a literary device to unite the descriptive portions of the essay. The opening paragraphs of this essay are

devoted to an inimitable description of the roadbed of this decayed turnpike, itself probably a composite of the Lynchburg-Salem Turnpike, which ran near Bradley's home, and the worst features of several others. While one might at first tend to ascribe this to Bradley's fevered imagination, a recently discovered photograph shows just such a turnpike, its surface so rough and hilly that traffic has been forced to revert to using the old colonial road along the route.

> The Bethel pike, or, as it is sometimes called, "the old rock road" . . . Regarding the second name conferred upon the decayed highway, along which I am going to ask the reader to travel with me in fancy for a short distance, it will be sufficient to say that the remains of the only effort on a large scale ever made in Virginia east of the mountains to macadamize a country road still strew its surface. This memorable achievement belongs to the days of stage coaches sixty or eighty years ago. It took the shape of a narrow causeway of rough rocks bisecting the broad mud track of which the ordinary Virginia road did then and still does consist, and was once regarded as the wonder of its time. I have seen old pictures—mostly advertisements it is true—of the stage coach flying along this crude embankment behind four horses all extended to a gallop. But ever since I can remember, the chief aim of the declining traffic has been to dodge the fearsome causeway by hugging first one fence and then the other, according as weather and circumstances permitted. Nowadays, indeed, you may travel for miles along the Bethel Pike without meeting any traffic whatsoever, whether horse or foot, and this not because the road has relapsed into a state of nature, for that is the normal condition of most Virginia roads, but because there are scarcely any people left to travel on it. The country hereabouts is hilly, but the old road crosses it with a disregard of gradients and of everything else except mathematical precision such as would have extracted admiration (at a respectful distance) from an ancient Roman. Indeed I have often thought that a thousand years hence possibly—for nothing short of dynamite will ever make any impression on this old road—some enthusiast may arise and declare that even Virginia was not exempt from the tramp of the Roman legions.

[*Image in original:* Photograph of an early road. *Caption:* A Maryland road similar to the one described by Bradley.]

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The Secretary's Old Rolling Road

Nathaniel Mason Pawlett

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The stirring events with which certain Virginian roads are associated make them historic. Braddock's Road immediately brings to mind young George Washington accompanying the ill-fated British general westward. The Three Notch'd and Marquis's Roads are indissolubly associated with Colonel Banastre Tarleton, Jack Jouett's Ride, the Marquis de Lafayette, and the ensuing, climactic events at Yorktown in October 1781. At the mention of the Valley Pike, Stonewall Jackson appears astride Little Sorrel, with his cap pulled low over his eyes. Many of Virginia's roads are indeed heavy with history, for the fate of the nation has often been determined upon them.

But if this is true for the more notable, there is a far greater number of roads which have played only supporting roles in the great pageant of our state's history. Laid down upon those great natural routes predetermined by Virginia's geography and dating from the animal and Indian paths of prehistoric times, these ancient roads have also been a determinant of many other things in Virginia's history. County lines, churches, and courthouses have all been located along them. Latterly, they have determined the locations of many of our twentieth-century urban areas. These roads of secondary historical importance are in fact the skeleton on which have been hung the muscle and tissue of Virginia's political, economic and social development over the last three and one-half centuries.

Most of these roads remain in service today, though such routes as U.S. 360, 460, 250 and 11 are now usually overlaid by straightened and improved two-and four-lane highways. The major proportion, however, remains surprisingly very close to its original state. Even where substantial changes have been effected, the earlier road is usually still discernible nearby. While only the longer, coherent roads have been mentioned, many roads of rather restricted length were of considerable significance in Virginia's development, although they usually connected either with one of the longer roads or a water transportation link at Tidewater or on one of the later canals and river navigations.

East of the Blue Ridge in the eighteenth century, many of these at some time or the other received the appellation "rolling road." This term derived from the practice of rolling to market (or to the nearest warehouse) the hogsheads into which tobacco was packed at the plantation or quarter where it was raised and cured. Although a practice of the earlier period, tobacco rolling was long continued, as the late nineteenth century photograph [below] will attest. The tobacco roller ultimately became something of a romantic figure, spawning Mary Johnston's novel, *Lewis Rand*, about a tobacco roller on the Three Notch'd Road. While there were many rolling roads at one time, today only a few bear witness to it by their names. Many roads are, however, still traditionally called "old rolling roads" by the local people throughout Virginia. One of these runs through Fluvanna and Albemarle Counties.

A tobacco roller of yesteryear (from Robert A. Lancaster, *Historic Virginia Homes and Churches*, 1915).

Among the plats in the early survey's books at the courthouse in Charlottesville can be found many references to one, variously called the Secretary's Road, the Secretary's Old Rolling Road and the Bremo or Brimmer Road. This road owes its existence to John Carter, a man who, though he never lived in Albemarle County, gave the name of his office, Secretary of State for Virginia, to a host of things in the vicinity. Besides the Secretary's Road, there are (or were) the Secretary's Ford where the Three Notch'd Road used to cross the Rivanna River into Charlottesville, the Secretary's Mill and the Secretary's Mill Quarter near present-day Carter's Bridge, and the Secretary's Clearmount Quarter a few miles to the eastward. From the Rivanna River to the Hardware River the mountain range is called Carter's Mountain, while the bridge in the gap through which the little Hardware River flows is called Carter's Bridge, this last after the Secretary's son, who was proprietor when the first bridge was erected there.

Just who was this man who gave his name to so many places in early Albemarle, while having never lived there at all? John Carter was the son of the famed Robert "King" Carter, one of the wealthiest men in Virginia. Although his father has received the most attention, John Carter was himself a powerful figure. Born in 1696, the first son of Robert Carter, he went to England in 1713 to complete his education, entering Trinity College, Cambridge in 1714. Thereafter, he received his legal training at the Middle Temple and was admitted to the bar in 1720. Staying on in London as the business agent for his family, he managed to secure appointment as the Secretary of State of Virginia in June 1722. Lord Culpeper had termed this post "the very next in Dignity to the Gouvernour," and it reportedly cost Carter and his father some 1,500 guineas for this office. While it had previously been the custom that the Secretary served at the King's pleasure, Carter was able to obtain the post for life. Delegating most of his duties to his deputies, he was to hold this post for nineteen years, always treating it as a sinecure.

A year and a half later Governor Drysdale nominated him to a seat on the Council, Virginia's version of the English House of Lords. Perhaps the quality of his family connections is attested by the presence there already of his father and his brother-in-law, Mann Page.

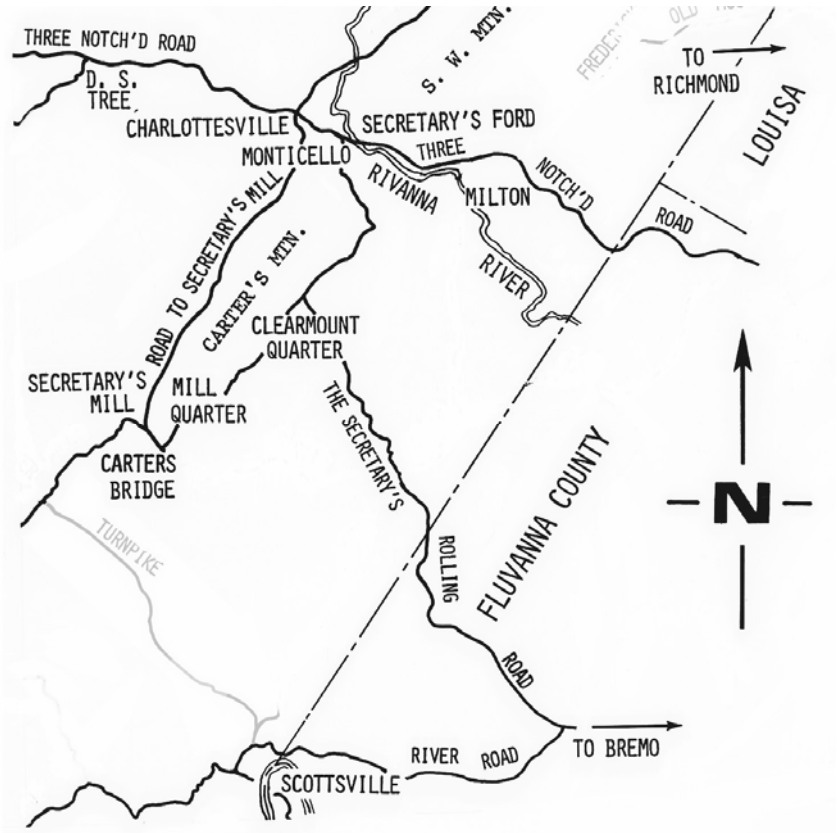
Drysdale admitted in his letter of recommendation to the Board of Trade that there might be some objection to Carter due to the close relationships, but said "there is scarce a qualified person in the Colony unattended with some such like inconvenience, for they are all incorporated either in blood or in marriage." Carter received the appointment at the age of thirty. Only the year before he had made a spectacularly good marriage with Elizabeth Hill, the heiress to the fortune of Colonel Edward Hill of Shirley Plantation. With the death of "King" Carter in 1732, John Carter, as eldest son, inherited all his lands in Lancaster County, including the home plantation, Corotoman, along with other large plantations in Essex and King George Counties. These, added to his own holdings within Lord Fairfax's Northern Neck proprietary and the fortune he acquired by marriage, made him one of Virginia's wealthiest and most powerful men. Removing his seat to Shirley, Carter was to become the cynosure of his family as Sir John Randolph was of his.

Little wonder, then that with all his land, wealth and erudition, John Carter would not be slow to acquire still more land in the newly created County of Goochland (1728). After 1725, as settlement moved up the James River into western Goochland, later to become Albemarle, a number of large patents were issued to such principal members of the Tidewater gentry as Richard Cocke (Bremo, 1725), Nicholas Meriwether (along the Southwest Mountain, 1730) and John Carter. Carter's 1730 patent of 9,350 acres encompassed a portion of the Southwest Mountain, here called Carter's Mountain today, and the lands on both sides. With a requirement to clear three acres in every fifty and to build a sixteen by twenty foot house within three years to perfect his title to it, Carter must have moved in a slave corps and overseer and begun work almost immediately.

By late 1733 two roads penetrated the present Albemarle County. (See map.) Along the bluffs above the James River ran the River Road as far as the Rockfish River, while along the ridge generally dividing the watershed of the Rivanna from that of the South Anna ran the Mountain Road (called Three Notch'd after 1742), presumably as far as the Rivanna water gap in the Southwest Mountain.

By 1734 it had become necessary to have a road to connect Carter's property with these. In July of 1734, the Goochland County Court issued an order for what has survived to this day as the Secretary's Road or the Secretary's Rolling Road. This connected the River Road with the Three Notch'd Road and ran from Bremo along the watershed between the Hardware and Rivanna Rivers to Carter's Quarter near the present Overton, east of Carter's Mountain, thence through the Thoroughfare (the gap) between Monticello and Carter's Mountain down to the Three Notch'd Road at the Secretary's Ford. Monticello would later be built in the intersection of these roads.

Another interesting aspect of this construction sheds some light on the station occupied by John Carter as Secretary of State. The original order for the road, 16 July 1734 Old Style, called for the opening of a road "from the Round pond Road to Coll John Carter's Plantation . . ." The next order, issued some six months later on 21 January O.S., was cryptic in its prohibition: "ordered that the Road from the round pond to the Secretary's Quarter be esteemed no Publick Road . . ." So a road constructed at public expense was to be given over wholly to



The area of John Carter's 9,350-acre patent, with later county lines and town locations added.

private usage! Indeed an interesting commentary on the eighteenth century's view of conflict of interest.

The Secretary's Road was, however, ultimately opened to public use, and was in the 1740s extended from his mill near Carter's Bridge down the Green Mountain, across the Rockfish River, south through the gap near the present Variety Mills, to the Tye River, where the Secretary had acquired another large tract called the Secretary's Tye River Quarter. Unfortunately, his name has not survived on this part of the road as it has on that from Bremo to Carter's Mountain.

Although the Secretary's Old Rolling Road remains today the main road through its area it could hardly be characterised as one of Virginia's great arteries of transportation. Its real significance lies rather in the part it played during its first several decades in the settlement and development of early Albemarle County. Along with such other giants as Nicholas Meriwether, Peter Jefferson, and Joshua Fry, John Carter was one of the prime movers in opening this area to settlement, even if he never saw fit to take up residence there.

Perhaps ironically, the Secretary's Road and the related place names are Carter's principal legacy to the area today. Most, if not all, of the buildings he erected are long fallen to dust, the Secretary's Ford lies disused, his mill site on the Hardware River is forgotten and he is often confused with his father, Robert "King" Carter, by local residents. The principal architectural ornaments surviving along the road, Bremo at one end and Monticello at the other,

while of national importance, owe their existence to the lands of others. Only the road remains as Carter's monument. As such, it epitomises those many historic Virginian roads which might be characterised as being "of state importance."

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Floods: Destroyers and Creators

Howard H. Newlon, Jr.

["Backsights" No. 55: originally published in the *Bulletin*, October 1979]

Natural disasters such as floods and earthquakes are great destroyers of property, including transportation facilities. But viewed in another perspective these disasters are creators of new structures erected to replace the old. These replacement structures often reflect a newer technology so that, like many examples of man-made "progress," what destroys the old often creates the new.

Floods are a particular threat to bridges, and it is not surprising that many of what today might be termed historic structures were erected to replace earlier structures lost to floods. It is thus of interest to review the major recorded floods that have "created" bridges in Virginia.

In August 1969, Hurricane Camille, concentrating its fury in four central Virginia counties, inflicted approximately $20 million in damages upon bridges and 250 miles of highways. Statewide property losses exceeding $100 million accompanied the tragic loss of 114 lives. Clearly this was a "100-year flood event" but just three years later, in June 1972, Hurricane Agnes arrived. Spread over a 60-county area, her impact was even greater in terms of damage to roads and bridges but, thankfully, loss of life was minimal.

During the period of Camille and Agnes reference was often made to the record floods of 1870 and 1877, approximately 100 years earlier, which, like their twentieth-century counterparts, were 100-year floods occurring in a comparatively short time span.

Records also indicate that a mammoth flood occurred in May 1771, but for that event the type of documentation accompanying the nineteenth and twentieth century floods is lacking. This flood was described in some detail in an article in the August 1951 *Virginia Cavalcade.* In the article there is no mention of losses to bridges or effects upon roads, largely because at this period such structures were rudimentary and short-lived at best. The 1771 flood resulted from almost two weeks of rain in the central Blue Ridge Mountain region and caused great damage along the James, Rappahannock, and Roanoke rivers. It was estimated that the Roanoke River rose 40 feet, which was about 20 feet higher than for the flood of 1776 and 10 feet higher than for the freshets of 1720 and 1724. It was said that at Richmond the James rose 15 feet higher than it had in the worst flood remembered by the Indians. The primary concern was for the loss of the principal money crop, tobacco, estimated at three million pounds. As a result of this flood the General Assembly in July 1771 enacted special legislation to relieve "the sharers in this Melancoly Catastrophe." The funds enabled the construction of new tobacco warehouses at Shockoe, Falmouth, and other important ports.

That the floods accompanying Agnes and Camille were responsible for the construction of many new bridges is apparent to anyone driving Virginia's roads. Casualties from these floods included many metal truss spans that have been replaced by more modern structures. It

should not be surprising, then, to find that a similar situation occurred after the earlier floods so that many of the metal trusses lost to the twentieth century floods owed their existence to those of the nineteenth.

While no extensive historical study has been done for floods in Virginia, their relationship to bridge replacement is evident and documentable. According to Caroline County historian T. E. Campbell, when John Murray, Earl of Dunmore, was chosen to succeed Lord Botetourt as Royal Governor early in 1772, he immediately launched a program of internal improvements to correct the damage caused by the extensive freshets of 1771. This program included improvement of navigation and control of floods along the Caroline County section of the Mattaponi River. The House of Burgesses refused to appropriate any funds for the program, but the crown granted a charter to a company to clear the channel and collect tolls from navigation for reimbursement.

A map of Caroline County trade routes before 1781 includes the location of "Butler's Bridge, circa 1772," reflecting the reconstruction or initiation of a bridge approximately where present Route 601 crosses the Mattaponi between Hanover and Caroline Counties. Prior to 1772 there was either a ford or bridge, the upgrading of which was a direct result of the 1771 floods. Interestingly enough, these floods also gave impetus to improved river navigation supported by flood control not unlike modern practices of the U.S. Army Corps of Engineers. Undoubtedly, other county histories reflect similar responses.

The oldest metal truss bridges surviving in Virginia, located during the Research Council's statewide inventory, date from 1878-1879. In other areas of the U.S., metal trusses of greater age have been identified. Again, the key factor was the great flood of November 1877, which had been preceded 7 years earlier by the greatest general flood since 1771. *The Richmond Daily Whig* for Monday, November 26, 1877, is almost completely given over to stories on the widespread destruction of what was characterized as "The Inland Ocean." Dispatches from various areas of the state were included. One titled "Warning from Lynchburg (Special to the Whig)" read:

> Lynchburg, November 24, 1877—11:20 A.M.— River rising rapidly; canal and river are one. Loss very heavy, and we fear will be more. River is still rising. You will get it. J.T.T.
>
> From Danville came the report dated 11:30 P.M.—"Dan River very high. Swept away houses and bridges. Gasworks submerged. City in darkness." Signed T.P.
>
> From Waynesboro came the report that "the County bridge at this place has been swept away and the water is up to the railroad bridge."

The Monday edition of the *Whig* containing these dispatches detailed the efforts of Richmond businesses along the James to evacuate and prepare for the expected cresting of the James. The account is reminiscent of more recent efforts which today are brought instantly to the public by television.

Almost all accounts of the 1870 and 1877 floods include descriptions of "bridges being swept away," but none reflect the scene more vividly than an account contained in William Asbury Christian's book *Lynchburg and Its People*, printed in 1900. Admittedly over-

embellished in the Victorian manner, the book notes that "the drought which had prevailed nearly all summer continued until Wednesday, September 28, [1870], when it began to rain." The people of Lynchburg were unaware that this was the beginning of a disastrous flood, but the rain continued in torrents and by Thursday night the river was described as "a hell of waters, howling, hissing and boiling in torture." Christian goes on to describe a lady who with her child "left their home and took refuge in a bridge below the city. The attention of two boatmen was attracted by a child's voice and turned in that direction. As they were striving to reach them they heard the child pleading with its mother, saying 'Don't cry; the storm will soon be over; God can see us, and if we are drowned He will know where to find us.' Later they heard the little voice say: 'Kiss me, mother, I can hold out no longer,' and the bridge went down with its precious burden." There follows a long poem describing this tragedy.

Most, if not all, of the bridges lost during the 1870 and 1877 floods were wooden but the replacements were in many cases the more modern metal trusses. These bridges appeared light with respect to their more massive predecessors and were greeted with suspicion.

The records of the Board of Supervisors of Bedford County reflect that in December 1877, a contract was awarded to the King Iron and Bridge Company of Cleveland to construct six metal arch trusses. These bridges, completed by March 1878, replaced six wooden structures lost in the November flood. The sole survivor of these six metal bridges was recently moved to a rest area on I-81 in Montgomery County for use as a pedestrian bridge.

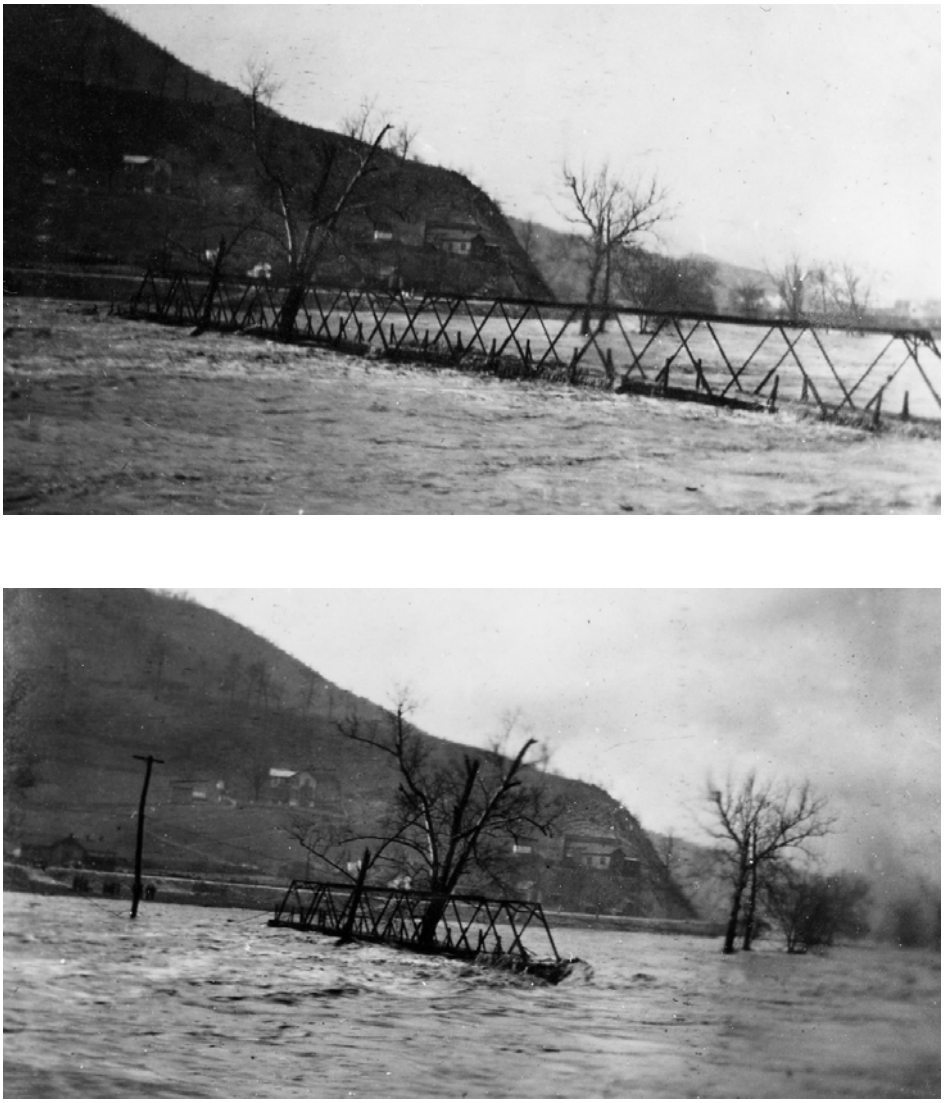
The oldest metal truss bridge at its original location in Virginia was also built by King Iron and Bridge in 1879 on Route 805 between Culpeper and Fauquier Counties. It was moved in 1977 after preservation efforts failed. This metal truss had replaced a wooden bridge destroyed by the 1877 flood, 100 years earlier. That bridge had, in turn, replaced a similar span burned during the Civil War.

The King Iron and Bridge Company also erected, in 1878, a large Whipple truss at Occoquan. Thus this truss, created by the 1877 flood, was destroyed in 1972 during Agnes, emphasizing that man and nature take turns in the destruction-creation process.

In addition to the major statewide floods in the seventh decade of each century, untold local freshets have caused considerable damage. Two of these major floods also occurred 100 years apart in 1836 and 1936.

The report of the James River and Kanawha Co. for December 10, 1836, presents a table of damage estimates from the "June Freshet" and "August Freshet." The Canal was particularly vulnerable to flood damage. The later floods of the 1870s coming so soon after the extensive damage inflicted during the Civil War contributed greatly to the demise of the Canal. The end of the Canal signaled the beginning of the Chesapeake and Ohio Railroad, which utilized much of its tow path along the James.

The 1936 flood, widespread over the Middle Atlantic and Northeastern States, caused widespread damage. The accompanying photographs illustrate the loss of a metal truss bridge over the James River in Alleghany County during this flood.



A metal truss bridge over the James River in Alleghany County is overcome by the rising waters during a 1936 flood.

Other examples can be cited but it is clear that, like man, floods are both destroyers and creators of bridges. The date plates on many of Virginia's bridges chronicle these natural disasters. Truly "the flood giveth and the flood taketh away."

"The tempest may sweep . . .": Carter's Bridge 1806-1816

Nathaniel Mason Pawlett

["Backsights" No. 56: originally published in the *Bulletin*, November 1979]

Last month's "Backsights" treated some of Virginia's more notable floods and their influence upon bridge replacement down through the years. That of the previous month was devoted to the Secretary's Road, which ran from Bremo to the site of present-day Charlottesville, and its creator, John Carter. Several place names were then mentioned which related to the Secretary, John Carter, and his descendants. Among these are two, the Secretary's Mill and Carter's Bridge, a closer examination of which may serve to further elucidate the subjects of floods and bridges, as well as roads themselves.

Located near the point where the little Hardware River passes through the gap between Carter's Mountain and the Green Mountain, the Secretary's Mill existed from the 1730s well into the nineteenth century. With the division of greater Albemarle County in 1761 and the subsequent removal of the courthouse from near Scottsville to Charlottesville, which was created in 1762, a bridge near this point must have become a necessity. On the most direct route (Route 20 today) to the new courthouse for those from the riverine section of the county having legal business to transact, it seems safe to suggest a bridge being constructed here by about 1765 at the latest. This bridge was probably replaced once or twice before 1782, if later experiences with the rampaging little Hardware River are any indication. Destruction of the county court records for the years 1748 to 1783 will prevent our knowing more about this, however.

Certainly by 1783 Carter's Bridge was in existence, although at least one other route was available to cross the Hardware River at a nearby ford. Travellers had the option of going east on Martin King's Road (Route 708) to turn south at Bellair Plantation, or perhaps earlier at the site of the Albemarle Forge and the later Eolus Mill, now moved and incorporated in the Boar's Head Inn at Charlottesville. Crossing the Hardware River at a ford with the rather forbidding name of Hard Times, they then proceeded southward.

The continuing popularity of the ford at Hard Times may be perhaps explained by examining a few years of the history of Carter's Bridge. Although road orders themselves are usually so cryptic that no mention is made of a specific difficulty or of the weather which caused it, bridge orders can indicate the frequent occurrence of storms and floods with attendant damage to the structures. By extension, they can also provide some idea of the difficulties under which overseers of roads must have regularly laboured in the performance of their duties.

Bridges have often been discussed in the "Backsights" series. Only the larger bridges requiring construction by a special contractor are normally the subject of court orders, smaller structures usually being erected as a matter of course by the overseers and labouring male titheables. Whether very many of these small bridges were actually erected we have no way of knowing. Smaller streams could be forded even in times of flood and many of these retained their fords well into the 1930s and 1940s, long after the automobile had made bridges or culverts

imperative. Among the bridges mentioned in Albemarle orders between 1783 and 1816 are Christopher Hudson's Bridge, Moore's Creek Bridge, the Rivanna River Bridge (later to be called Free Bridge), and Carter's Bridge.

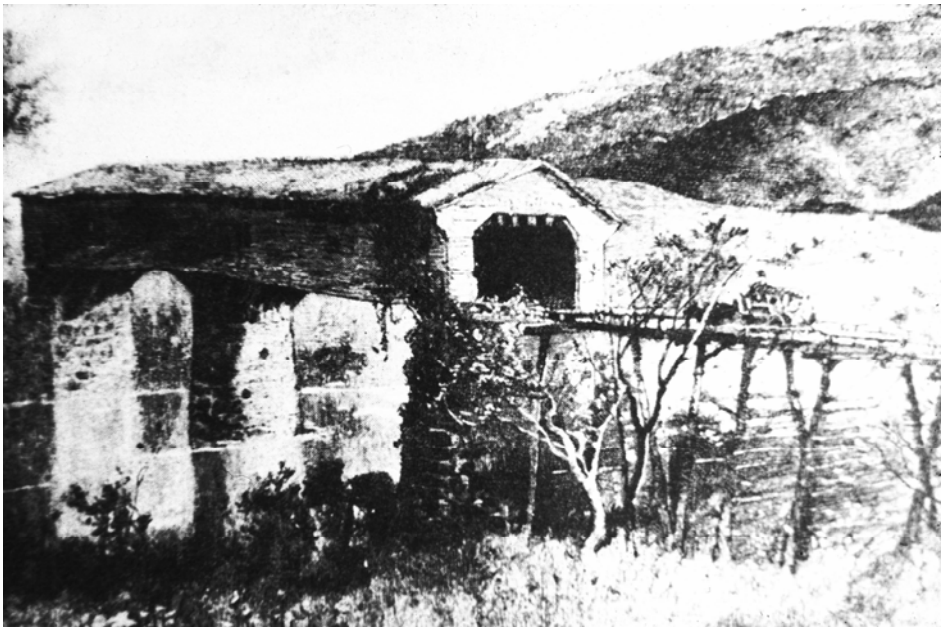
Christopher Hudson's Bridge would seem to have stood on Route 795 at the crossing of the Hardware River several miles downstream from Carter's Bridge, and may have been erected by him while serving as overseer of roads or it may have taken its name from its location near Mount Air, his plantation. Alternatively, it may have been erected prior to 1783, since no order survives for its construction.

Moore's Creek Bridge, located on the road to Scottsville (one was earlier erected in 1798 on the Old Lynchburg Road), was ordered constructed on September 8, 1801, and was in place by December 7 of the same year when a payment of $125.50 was authorized for it. Strangely enough, an inspection to see whether it was well constructed was not made until February 7, 1803, long after payment had been made. On March 9, 1803, abutments were ordered to be constructed to it (a separate operation usually handled by the overseers and titheables of the road) and it was formally "received" by the county. By April 2, 1811, it would be in need of repair or replacement.

The Rivanna River Bridge (later Free Bridge) was designed to cross the Rivanna at a place where it was narrower and the bridge would therefore be less expensive. A site near the present Route 250 crossing was selected in preference to one nearer the Secretary's Ford where the Three Notch'd Road crossed. This latter, when bridged in 1825 by William H. Meriwether's private toll bridge, gave rise to the "free bridge"name for the upper one which charged no tolls. The court ordered that a contract for the Rivanna River Bridge be let on October 5, 1801. It would survive until 1843, when it was carried away in a flood, to be shortly rebuilt.

Carter's Bridge, on the other hand, was in an almost continual state of repair or rebuilding. Perhaps we should say Carter's Bridges, for there were two. That on the road to Scottsville (Route 20) was usually referred to as "the big bridge over Hardware" while the other was located slightly to the north at the Secretary's Mill (intersection of Routes 20 and 708), or Carter's Mill as it was now called. The "big bridge" crossed the Hardware River while the other traversed only the north fork of the river. Both were timber-framed bridges but whether with stone abutments and causeways it is now impossible to say. Let us look at the history of these spans for the ten years from 1806 to 1816. Bear in mind that these bridges had already been replaced several times (at least) between 1765 and 1806.

An order of October 6, 1806, called for repairs to be made to them, presumably as a result of flood damage recently sustained. A year later the County Levy (October 6, 1807) reveals a payment of $155.50 for building a bridge across the Hardware and for repairs to the new bridge across the same river. This must represent a replacement of the smaller bridge and repairs to the larger, if the size of the expenditure is compared to later ones. Three years were to elapse before the next mention of Carter's Bridge, perhaps years of drought!



The "big bridge over Hardware River" was probably similar to this one over the Rivanna River that was called the Free Bridge.

On October 10, 1810, viewers were appointed to examine "the big bridge on hardware below Carter's mill & report the situation thereof," indicating that all was not well. All was definitely not well for the sheriff was ordered on January 7, 1811, to summon all the gentlemen justices to the next meeting of the court to levy money to rebuild the "big bridge," a call repeated the next month (February 4, 1811) with the proviso that the purpose was "to deside (sic) on the propriety of rebilding (sic) Or repairing the big bridge. . . ." Apparently this was to be a large undertaking. Perhaps some of the justices were reluctant to endorse an undertaking which would shortly raise their tax rate.

Finally, on March 4, 1811, commissioners were appointed to let the repairs or rebuilding of the bridge. A year passed. More commissioners were added to those already appointed (March 2, 1812), and a report in favour of rebuilding was finally handed in on April 7, 1812. Another summons now issued for all the gentlemen justices to appear at the next court to appropriate funds for this venture. The condition of the bridge while all this was going on nowhere appears. One is left to conjecture whether the bridge was still serviceable, collapsed, washed off its abutments by flood, or what. On June 1, 1812, the commissioners reported that they had let the contract, that the bridge was completed and that it was satisfactory and Rezin Porter was to be paid $725 for its construction.

A comparison with the expenditure of October 6, 1807, would indicate this was a major construction project. Then $155.50 bought one bridge across the Hardware and some repairs to another one so that $725 must have purchased a considerable bridge for the people of Albemarle County. Unfortunately, the difficulties with this bridge would continue. Less than a year later, on April 6, 1813, viewers were again appointed to examine it, and on 2 August it was ordered that a contract be let for necessary repairs to "the Bridge across Hardware." Shortly (December 6, 1813) the Commissioners reported that a contract for repairs had been let at $154.

Events of the year 1814 seem to have rendered this order moot by washing away both it and the smaller bridge before the repairs could be completed. On August 1, 1814, an order issued to build two new bridges across the Hardware below Carter's Mill. Evidently the little river had again done its work. By May 1, 1815, the bridges were once again in position over the Hardware River and the next month (June 6, 1815) James Old received $140 for building one of them and John and William Dunkum $400 for the other.

But even though the old bridge under repair had been swept away, the repairs, or some portion of them, remained to be paid for. Thus on November 8, 1815, the commissioners were ordered to report to the court "what was the deficiency in the repairs of the bridge across hardware at the time that it was carried away by the fresh and whether the said bridge if it had been Completed according to the Contract of James Porter would have sustained force of the said fresh and also to report what the deficiency of repairs was worth at the time it was taken away." Finally, on June 4, 1816, Porter received $124, noted as "after deducting $30 per report of Commissioners" in the County Levy.

This story would be repeated throughout the nineteenth century as the little river went on its periodic rampages. One is tempted to question why an arrangement of bridge and abutments strong enough to withstand the floods was not eventually constructed by the county. Perhaps the best answer to this is our recent experience with hurricanes and floods in Virginia with attendant loss of lives, houses, bridges, etc. Given the unleashing of sufficient natural forces, even the twentieth century's well-engineered bridges, abutments and roadways have fallen before the floodwaters. What must have then been the case in a time possessed of only limited engineering and technological capabilities? And if this was the effect upon a major bridge, what must it have been upon the many smaller bridges erected by individual overseers, the fords, drainage ditches and the miles of road surfaces themselves, things of which we have no such detailed records? Considering the number of such storms each year in Albemarle County, it is a wonder that any coherent system of roads could be maintained at all.

In land patents and in the earliest records of Goochland County the Hardware River often appears as the Hardwar River. Perhaps this early name reflects the observation of some early settler on the character of this little river—that it was indeed a "hard war" to cope with it.

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Building a Truss Bridge—"But Not on the Cheap Plan"

Howard H. Newlon, Jr.

["Backsights" No. 57: originally published in the *Bulletin*, December 1979]

The comparatively few nineteenth century metal truss bridges that survive in Virginia represent a relatively high level of engineering expertise and also reflect a number of builders from other states such as Ohio, Pennsylvania, and New York. In view of the fact that these bridges were built under the jurisdiction of local county governments and sometimes by groups of citizens, the question arises as to how local groups availed themselves of the expertise necessary to accomplish the task. Why, for example, did New York firms like the Groton Bridge and Manufacturing Company and the Horseheads Bridge Company build bridges in rural Augusta and Culpeper Counties? Was it unusual for these companies to work at such distances from their home office?

The answers to these questions can't be given with certainty, but considerable insight into the process by which these bridges came into being can be obtained from a series of accounts that appeared in the New Market newspaper, *The Shenandoah Valley*, between June 1891 and September 1892. These articles described the planning, funding, and erection of an "iron bridge" over the North Fork of the Shenandoah River between New Market and the New Market depot located slightly west of town.

These accounts are of interest not only for the description of the bridge-building process itself, but also because they reflect the local initiative and perseverance required to achieve a new bridge, a structure that was often to become a focus for community effort and pride. The process described in the *Valley* probably was similar to that which brought into being many of the metal truss bridges that continue in service across the Commonwealth.

The story begins with brief notices appearing in the issues of June 4 and June 11, 1891, announcing that a meeting would be held on Saturday, June 13 at 3 p.m. in the Polytechnic Hall at New Market to consider a solution to the problems of the unsafe wooden bridge, at a location described as "of inestimable value" to the people of Rockingham and Shenandoah Counties. The notice was signed by most of the leading citizens of the area.

In the *Valley* issue of June 18 an extensive summary of the meeting appeared. After having elected a chairman and secretary, the group had heard a report from three citizens who had inspected the bridge. The report had emphasized the importance of the bridge and its unsafe condition. It was probably not a coincidence that the chairman of the committee was J. H. Brenaman, who also was chairman of the County Democratic Committee. Various people had expressed views in support of repairing the bridge, so as to last five years, at a cost of $300, versus construction of a new iron bridge. It had been noted that construction of a new bridge "would take money and determined effort; that we could not expect the county to pay all; for neither Shenandoah nor Rockingham built bridges upon established roads at their own cost, and this one would be no exception."

The group had agreed that a new iron bridge was the proper solution, had appointed a committee, and scheduled a meeting for two weeks hence.

The call for the June 27 meeting had closed with the admonition that every citizen should "put aside excuses and be present," and the report of that meeting reflected a good attendance. Correspondence had been initiated with several companies who had "offered to send their engineers to take measurements and get exact data, upon which to base their estimates, without charge, except for traveling expenses—all to bid upon the same specifications." The group had agreed to "communicate at once with some reputable firm, to send their engineer, to make a survey, specification, etc." The newspaper account noted that the chairman had acted promptly and that by Thursday evening a survey had been made by Mr. Nelson of the firm of Nelson and Buchanan of Chambersburg, Pennsylvania, who represented a large Pittsburgh firm, and that drawings and specifications would be received in due time. The large firm was the Pittsburg Bridge Company. Nelson and Buchanan built other bridges in Virginia including, in 1896, a three-span bridge which survives in Alleghany County. Groups organized to begin raising funds and it was agreed to meet the following Saturday at 4:00 p.m. It is interesting to speculate how many people today would be expected to attend such a meeting since it would be the Fourth of July.

The report of the meeting on July 4 indicated that the drawings and specifications were still expected momentarily, but that from present information the cost would be about $6,000. It was hoped that the county would supply $4,000, so that the goal for the community was $2,000. The focus of the efforts was the next meeting of the County Court, scheduled for Monday, July 13. A large turnout was desired for the Bridge Committee meeting on July 11 and the court session. The article closed with the admonition, "Let the good work go on. Contributions to the bridge should not be looked at as gifts—but a matter of business investment to a necessity . . ."

The reports of the July 11 meeting and the July 13 session of the county court are of particular interest as they contain a summary of the petition to the court stating the circumstances that had led to the current bridge crisis. It was noted that in the l860s, "the citizens of the community opened a road to the depot, paying $2,950, besides some labor, for land damages, grading, bridge, etc; that the bridge taken away by the flood of 1870, was rebuilt at a cost of $1,500; that in 1878, they built another bridge at a cost of $1,500; that about $3,000 was received for tolls, which was expended upon the bridges and road—making a total of $9,000 expended by our people, without any help from the county, up to the time the county condemned the road and bridge, some two years ago—no one receiving any return for the money contributed, except the use of the road. So far the county has only allowed us $900, and the bridge stands condemned by the road board."

After the citizens' presentation and discussion, the judge "decided to grant, subject to the approval of the Board of Supervisors, three-fifths of the amount—the county's part not to exceed $4,000—and the citizens two-fifths, for the construction of an iron bridge, at the point indicated." This same two-fifth/three-fifth ratio had been used by the state in matching local or private funds since the creation of the Board of Public Works in 1816.

Now the campaign began in earnest! The paper carried a long and impassioned plea by Chairman Brenaman for funds and support. The plea is too long to quote but it reflects the same tone of crisis and the attempt to embarrass the non-contributor that are associated with modern TV evangelism. It noted that between 1868 and 1888 over $9,000 had been expended, more than enough to build a first-class iron bridge. To build such a bridge would be "a legacy to your children and children's children. . . . Don't let your sons and daughters say, in after years, our fathers had a chance to build an iron bridge, but they made the mistake of going on the 'cheap plan.'"

Subsequent reports reflect group concern that the citizens' share would not be raised by August 14, when bids were to be received from the companies scheduled to send representatives. The gauntlet was thrown: "If on Aug. 14th, we are not ready with our part of the funds, the Board of Supervisors, as well as the representatives of the bridge companies, will return to their respective homes with the story that the iron bridge at New Market was a fizzle. . . . It will be a stigma upon this community for all time to come."

The *Valley* issue of July 30 carried a report that the ladies of New Market had organized to help with the fund raising, and the August 6 issue of the paper carried headlines "Bridge Banquet!" "Brilliant Fire Works!" "Balloon Ascension!" "Brass Band Music!" The ladies were at work. A "Bridge Banquet" had been organized on the Polytechnic grounds for the nights of August 12, 13, and 14. It was noted that the grounds would be "brilliantly illuminated. Mellifluous music will beguile the hours, and bounteous meals and delicious refreshments regale the inner man, whilst to vary the programme brilliant fireworks will at intervals illuminate the scene—making it one of splendid grandeur."

A good, full meal would be available for 25 cents. Despite rain on the first night, the ladies raised $380.25 with expenses of $30. The effort was so successful that it was extended to a fourth night. It was noted that all members of the Board of Supervisors attended. Representatives of the competing bridge companies were also present.

On August 14, the following representatives tendered bids: G. W. Owens, representing Champion Bridge Co., Wilmington, Ohio; A. Langstaff Johnston, King Iron Bridge and Manufacturing Co., Cleveland, Ohio; W. N. Cleveland, The Variety Iron Works Co., Cleveland, Ohio; Wm. J. Struble, Indiana Bridge Co., Cincinnati, Ohio; F. R. Stewart, The Youngstown Bridge Co., Youngstown, Ohio; G. A. Masters, Smith Bridge Co., Toledo, Ohio; Carle F. Spinney, with Finley & La Chicotte, general agents Wrought Iron Bridge Co., Canton, Ohio; T. M. Nelson, Pittsburgh Bridge Co., Pittsburgh, Pa.

The bids were close—not varying $500. Despite Nelson's initial efforts, he was not the successful bidder. The low bid of $7,250 was submitted by the Wrought Iron Bridge Co. This did not include abutments and fills. Thus more funds were needed.

The *Valley* for September 10 noted that since all conditions of the contract had not been met, it had been cancelled and another letting scheduled for September 18. This time eight companies submitted bids and Messrs. Nelson and Buchanan, agents of the Pittsburgh Bridge Co., were awarded the contract for $6,900. The bridge was described as one 200-foot span and

one 60-foot span, both 16 feet wide. The bridge was to be completed within ninety days after the date of contract. Apparently Nelson and Buchanan declined the contract, although no mention is made of this in subsequent accounts. In October, however, representatives from "12 of the leading bridge companies" met and submitted bids for an iron bridge 230 feet long and 18 feet wide. Who was responsible for the redesigned bridge is not stated. This time the successful bidder was the Groton Iron Bridge Co. of Groton, N.Y., whose bid was $5,550. The masonry contract was let to Snyder and Wood (apparently local masons) at a cost of $6 per cubic yard complete for the 423 cubic yards necessary. It was noted that the fills would, it was hoped, be built with volunteer labor. It was also stated that $7,300 had been pledged. Work on the abutments began on Monday, October 19, and periodic progress reports subsequently appeared in brief news items. It was also noted that the committee had employed an expert engineer, C. Heltstater of the Norfolk and Western Railroad, to superintend all the work. The report on October 23 indicated that the foundations had been dug out and stonework was in progress.

On November 5 appeared the statement, "the money subscribed by the citizens toward the bridge is now needed." A local banking firm was designated to receive the funds. This same admonition appeared weekly, and by December the statements grew stronger, stating that the bridge committee must insist that subscribers pay up. The bridge was scheduled for completion January 26. In addition to the insistent call for funds, a new call went out. Volunteers were needed to build the fills to put the bridge in use, since the new bridge would be greatly endangered by freshets unless the old bridge could be quickly removed. The deadline wasn't met due to bad weather, and the *Valley* of January 28, 1892, reissued the call for volunteers. It also carried the announcement that the bank designated to receive the funds had failed. The issue of February 4 reported that the iron for the bridge was now coming in and that it would be only several weeks until the much needed bridge would be completed. The account concluded, "Let the fills be made, so that we can get on it. Rally to the work." The following week a brief news item reported that a man working on the bridge had fallen off of it, a distance of 135 feet. It reported that "striking the water saved him from being hurt, and his knocking a hole in the river (letting out the water), saved him from drowning." The report on February 18 was that Messrs. Houser, Osgood, and Dick of New York State, with helpers from the community, were erecting the superstructure and answering a "thousand and one questions." The call for payment of subscriptions was reissued, noting that $509.97 had been lost in the bank failure but that this had been guaranteed by a "public spirited responsible gentleman." It was noted simply that "It takes money to pay cash," and that "payday was coming."

Apparently the citizens, as they viewed the construction of the bridge for which they had worked so hard, began to have reservations about the safety of the rather light framework because the account states that "while the 'bosses' may not be able to make all understand it, they say our 230 foot, single span bridge will stand without anything under it, and when completed, will safely hold all the wagons, traction engines, etc., that can be put on it, 'in a string'." The scheduled completion date was now the first of March.

The *Valley* of March 3 announced that the bridge was completed except for the fills and that volunteers were still needed. A notice also appeared announcing that subscriptions not paid by March 15 would be placed in an "officer's hands for collection."

The admonition for work on the fills continued through March, and finally the issue of March 31 announced that the old bridge had been closed and that the new one could be used, even though the fills needed work and the approach grades "are a little steep."

The next reference to the bridge appeared in the *Valley* issued September 8, 1892, under the title "The Bridge Again." It reported the amount that the citizens had contributed to be "$2,919.99, while the County had expended $4,650, including a supplement to its original pledge. The account stated that "we now have one of the best single span iron bridges in the state constantly in use since February—and it is indispensable to the community. There remains but one thing yet to be done—that is, to pay what is still due on it." At the time of settlement, a mortgage of $l,000 had been taken on the bridge, and if the note could not be met the bridge undoubtedly would be sold and become a toll bridge. "Surely a rich, prosperous community like this can not afford to let a bridge costing over $8,000 pass out of its hands and become a toll bridge, for the sake of some $500." A complete listing of contributors and the amounts was published. Publication of this listing clearly had two purposes: to acknowledge the contributions, and also to permit the public to identify those who hadn't given their fair share. These individuals were the targets for raising the additional funds. As noted, "it is easy to censure and find fault, and many who do this are not the most active and liberal in giving their time and money in public improvements."

It is interesting that adjacent to the bridge article was a brief account of the fact that "James J. Corbett knocked out John L. Sullivan, the monarch of the ring, in the twenty-first round." Noting that "Sullivan was badly used up, while Corbett was little hurt," the article reported that the fight was witnessed by 9,000 people and involved a purse of $25,000 plus side bets of $10,000. Far from objective reporting, the account concludes, "It certainly is a shame for any civilized country to tolerate such barbarity." Perhaps the location of the articles was intentional to emphasize the editor's view of priorities and the potential failure of this community effort for the lack of $500.

The contributors' list included approximately 250 names. Several individuals contributed $100, but the vast majority gave $5 or less. The final tabulation was as follows:

From Supervisors	$4,000.00
Subscriptions collected	$2,082.25
Realized from bridge banquet	$352.12
Extra appropriation from supervisors	$650.00
Borrowed from different parties	$360.00
Contribution from B&O RR	$219.35
Total	$7,663.72

Apparently the efforts to raise the additional funds were successful. In any event the bridge served the area on Rte. 728 until it was replaced in 1969. No photograph of the structure in place has been found, but old inspection reports show that it was a Pennsylvania (Petit) truss

very similar to that shown in the accompanying photograph of a structure also over the Shenandoah River, but at a different location, and built in 1912.

This Page County bridge, photographed in 1910, is similar to the New Market bridge described in the accompanying article [from the *Fourth Annual Report of the State Highway Commissioner* (Richmond, 1911)].

Some elements of the process by which a needed bridge is planned, funded and built remain, but others have changed greatly in the almost 100 years since the concerned citizens met at New Market. In 1891, two months elapsed between their initial meeting and the first contract award. Today several years would be required to comply with various planning and legal requirements. Local input continues to help in establishing priorities, but the design and planning of the project is now the responsibility of the state. Securing funds continues to be a problem but on a broader and much more abstract scale than the potential loss to the community of a completed bridge for the want of $500. The unquestioned recognition in the nineteenth century that such projects as the New Market bridge were vital to the future of the community has given way to the various competing demands in our more complex society that seriously question the need for many public improvements. Bridge banquets and balloon ascensions have given way to public hearings and environmental impact statements.

But despite these changes, hopefully those of us associated with modern attempts to meet the transportation needs of the Commonwealth have not lost the sense of vitality that is reflected in the construction of the New Market bridge. We are indeed providing for the needs of "our children's children" and hopefully they will not say "they made the mistake of going on the 'cheap plan.'" Rally to the work!

John S. Wise: "Among the Mountains"

Nathaniel Mason Pawlett

["Backsights" No. 58: originally published in the *Bulletin*, January 1980]

John Sergeant Wise (1846-1913), the son of Governor Henry A. Wise, in his youth served in the Confederate Army and later practiced law in Richmond (1867) and New York (1888-1907). Besides being a lawyer and politician, Wise was an author of no mean ability. In 1899 he published The End of An Era*, an account of his experiences down to the end of the war in 1865. One chapter was entitled "Among the Mountains" and described his residence for a while in 1862 in Franklin County, then still comfortably removed from the active operations of the war. His moving account of the stagecoach journey to Rocky Mount, its residents and the daily life that ebbed and flowed about the tavern with its stagecoach link to the outside world is worthy of a place alongside the works of George W. Bagby and A. G. Bradley.*

> Rocky Mount, our place of refuge, was a typical Virginia mountain village. Even at this present time, when it has its railroad and telegraph, one in search of seclusion from the outside world might safely select it for his purpose. Month after month, year after year roll by without other things to vary its monotony than the horse-tradings, or public speakings, or private brawls of court days, or an occasional religious "revival."
>
> But in the summer of 1862 the excitement of war, and the ferverish anxiety to know of its progress, and the unusual activity in every sort of trading, pervaded even that secluded locality.
>
> The nearest point to us reached by railroad or telegraph was a station named Big Lick, upon the Virginia and Tennessee Railroad, in the county of Roanoke. Round about Big Lick, whose population did not exceed thirty persons, the valley of the Roanoke River was, as it still is, a veritable land of Goshen. The adjacent farms, now covered by the populous city of Roanoke, were in a state of excellent cultivation, and counted amoung the most fertile in that beautiful valley. Hereabouts were the stately homes of the Tayloes, the Wattses, the Prestons, and many other representatives of the oldest and wealthiest families of southwestern Virginia. . . . To the east and south of them was the Blue Ridge, and beyond it our home. From the railroad station the stage road ran for a mile or two through the valley, then crossed the Roanoke River by a ford at the base of the mountains, then plunged into the rugged range. Winding up hill and down vale it went on, through pass and gorge and over tumbling mountain-stream, until it emerged into the rough foot-hill country east of the Blue Ridge, in which was our new home.
>
> Twenty-eight miles of travel over such a route seems much more than the measured distance and carried us indeed into a new class of population, as distinct from that which we left behind as if an ocean instead of a mountain range had separated the two communities. Soon the broad pastures and fields of grain had disappeared. In their place were rough, hillside lots, with patches of buckwheat or tobacco. Instead of the stately brick houses standing in groves on handsome knolls, all that we saw of human habitations were log-houses far apart upon the mountain sides, or in the hollows far below us. No longer were pastures visible, with well-bred cattle standing in pooly places, shaded by sugar maples, bathing their flanks at noontide. No more did we meet smart equipages drawn by blooded horses. . . Up, up, up,—until the mountain side fell far below our track; down, down, down,—until our wheels ground into, and our horses scattered about their feet, the broken slate of a roaring stream. Now, following the sycamores along its banks, with here a patch of arable land and its mountain cabin, whence a woman smoking a pipe, and innumerable tow-headed children hanging about her skirts, eyed us silently; and there another roadside cabin,

with hollyhocks and sunflowers and bee-hives in the yard, the sound of a spinning-wheel from within, a sleeping cat in the window, and a cur dog on the doorstep; here a carry-log, with patient team drawn aside upon the narrow road to let us pass, the strapping teamster in his shirt-sleeves, with trousers stuck into his cowhide boots, leaning against his load so intent in scrutiny of us that he barely noticed our salutation; here a bearded man, clad in home-spun and a broad slouched hat, riding leisurely along on his broad-backed, quiet horse, carrying the inevitable saddle-bags of the mountaineer; here a woman on horseback, with long sunbonnet, and coarse, cotton riding-skirt, and bag slung at the saddle-bow, and small boy, with dangling bare feet, riding behind her; here a spout-spring by the roadside, where the living water of the mountain side leaped joyously from a hollow gum-tree log grown green in service; now mounting upward again until all that is visible is the winding road, with the blue sky above it, and the massed tree-tops below, and the curling smoke of some mountain distillery, with nothing to break the stillness but the heavy hammering of the log-cock upon some dead limb, or the drumming of the ruffed grouse far away. So, on and on we toiled, until we reached the open country beyond the mountains, and late in the evening our steaming horses drew up at our new home, which was strange and different from any we had ever had before.

Our house was large, among the newest and most modern in the village, prettily located on the outskirts on the highest knoll in the place, and commanded a fine view of the little valley and Bald Knob, and the mountains through which we came. The stage road, after passing our house, entered the main street of the village, which was a rocky lane upon a sharp decline, with stores and houses scattered on either side, terminating at an inclosure where stood the court house, clerk's office, and county jail. Halfway down this street was the tavern, an antiquated structure, with a porch extending along its entire front, its brick pillars supporting a second story overhanging the porch. This porch, which was almost on a level with the street, was provided with an ample supply of benches and cane-bottom chairs. At one end of it, suspended in a frame, was the tavern bell, whose almost continual clang was signal for grooms to take or fetch horses, or summons to meals.

The tavern porch was the rallying-point of the town: hither all news came; here all news was discussed; hence all news was disseminated. From this spot the daily stage departed in the morning. Here villagers and country folk assembled in the day and waited in the evening; and to this spot came the stage in the evening, bearing the mail, the war news, and such citizens as had been absent, visitors who drifted in, or soldiers returning sick, wounded, or on furlough.

Supreme interest centred ever about the arrival or departure of the stage. In the foggy morning it appeared with its strong four-in-hand team, and took its place majestically in front of the old tavern. The porters rocked it as they dumped the baggage into the boot; the red-faced driver came forth from the breakfast-room with great self-importance. With his broad palm he wiped away the greasy remnants of his meal, lit his brier-root pipe, drew on his buckskin gloves, settled his slouched hat over his eyes, clambered to his seat upon the box, gathered his reins and whip, and cast a glance towards the post-office across the way; an aged man and a meek-eyed woman in simple garb slipped quietly into the rear seats, going perhaps on some sad mission under summons to a far-off hospital at the front; a dainty miss, with bonnet-box and bunch of flowers, kissed papa and mamma and took her place within, full of joyous anticipation, doubtless, for even in war times girls love to visit each other; a fat commissary, returning from his search in the back country for supplies, came forth, reeking with rum and tobacco, and swung up awkwardly to the seat beside the driver. Tom, Dick, and Harry, the new recruits bound for the front, proud in their new and misfit uniforms, seized mother, wife, sister, or sweetheart in their arms, kissed them, bade them have no fear, and scrambled lightly to the top. The lame and tardy postmaster hobbled forth at last, and threw his mail-pouch up to the dashboard. The coachman gave his warning cry of "all aboard," the hostlers drew off the blankets, the long whip cracked its merry signal; with discord in each footfall at the start and concord as they caught the step, the horses pulled away; and the lumbering stage went grinding up the stony street, its horn signing its morning carol to those who were awake. As they disappeared over the hill-top, a last merry cry of parting came back from the

bright boys on the stage-top, and the last they saw of home was the waving tokens of love from those they left behind.

As the day advanced, the tavern porch again took on an air of life.

Everybody traveled upon horseback. By midday, the country folk began to stream in. Up and down the street a gradually increasing line of saddle-horses were "hitched." Women, old and young, arrived,—all of conventional dress, and with horses singularly alike. Their bonnets were the long-slatted poke-bonnet; their riding-skirts, of coarse cotton. Alighting at the horse-blocks, they untied and slipped off the skirts and tied them to their saddlebows, revealing their plain homespun dress. Their horses were broad-backed, short on the leg, carried their heads on a level with their shoulders, and moved with noses advanced like camels. They had no gaits but a swift walk, a gentle fox-trot, or a slow, ambling pace. When they had "hitched the critturs," these women went poking about the stores, or the tavern kitchen, or the private houses, with chickens or butter, or other farmyard produce, seldom speaking further than asking one to buy; and when their sales were effected and little purchases made, they went away as silently as they had come.

The men came by themselves. Their principal occupation seemed to be horse-trading. At times, the neighboring stables, and even the street itself, were filled with men leading their animals about, and engaged in the liveliest of horse-trading. A considerable portion of the population belonged to a religious sect known as Dunkards. In appearance, they were solemn and ascetic. The men wore long, flowing beards, and their homespun dress was of formal cut. Their doctrinal tenets were opposed to slavery and to war. Whenever political or military discussions arose, they promptly withdrew. They were very strict temperence men, and decent, orderly, law-abiding citizens, but horse-traders! It must have been a part of their religious faith. A Dunkard was never so happy as when he was horse-trading.

There were others, too, to whom temperance was not so sacred as to the Dunkards. By three or four o'clock, the tavern bar was liberally patronized. The recruiting-office had its full quota of young fellows inquiring about the terms of enlistment. The tavern porch was filled with people discussing war news, and the quartermaster down the street had more horses offered to him than he was authorized to buy.

At such times, a favorite entertainment was to draw General Early out upon his views of men and events, for the edification of the tavern-porch assemblage.

He was a resident of Franklin, and at that time sojourning at the tavern. He had been severely wounded in the battle of Williamsburg in May, 1862, and was now quite convalescent, but still on sick leave. He was a singular being.

Franklin County had been strongly opposed to secession. Jubal A. Early was a pronounced Union man, and was elected from his county as her representative to the Secession Convention. In that body he had opposed and denounced secession until the ordinance was passed. As soon as the State seceded, he declared that his State was entitled to his services, and tendered them. He was a man of good family, a graduate of the West Point Military Academy, and possessed unsurpassed personal courage. In 1862, he was a brigadier-general, and had been conspicuously brave in the battle in which he was wounded. His subsequent career in higher commands was disastrous. After the war, he became notorious as the most implacable and "unreconstructed" of all the Confederate generals. He was a man deeply attached to a small circle of friends, but intensely vindictive and abusive of those he disliked.

At the time of which I write, he was the hero of Franklin County, and, although he professed to despise popularity and to be defiant of public opinion, it was plain that he enjoyed his military distinction. It had done much to soften old-time asperities, and blot out from the memory of his neighbors certain facts in his private life which had, prior to the war, alienated from him many of

his own class. In fact, I doubt not he was a happier man then than he had been for many a year before, or was at a later period, when he became more or less a social and political Ishmaelite.

He was eccentric in many ways,—eccentric in appearance, in voice, in manner of speech. Although he was not an old man, his shoulders were so stooped and rounded that he brought his countenance to a vertical position with difficulty. He wore a long, thin, straggling beard. His eyes were very small, dark, deep-set, and glittering, and his nose aquiline. His step was slow, shuffling, and almost irresolute. I never saw a man who looked less like a soldier. His voice was a piping treble, and he talked with a long-drawn whine or drawl. His opinions were expressed unreservedly, and he was most emphatic and denunciatory, and startling profane.

His likes and dislikes he announced without hesitation, and, as he was filled with strong and bitter opinions, his conversation was always racy and pungent. His views were not always correct, or just, or broad; but his wit was quick, his satire biting, his expressions were vigorous, and he was interestingly lurid and picturesque.

With his admiring throng about him on the tavern porch, on summer evenings in 1862, General Early, in my opinion, said things about his superiors, the Confederate leaders, civic and military, and their conduct of affairs, sufficient to have convicted him a hundred times over before any court-martial. But his criticisms never extended to General Robert E. Lee. For Lee he seemed to have a regard and esteem and high opinion felt by him for no one else. Although General Lee had but recently been called to the command of the army, he predicted his great future with unerring judgment.

The arrival of the stage not infrequently interrupted General Early's vigorous lectures. For half an hour or more before the event, the expectant throng would increase, and, as those who "brace" themselves for the crisis were there, as everywhere else, conversation grew louder and agitation greater as the time approached. Then the stage would heave in sight in the gloaming, and come rattling down the rough street, the horseshoes knocking fire from the flints. Before the smoking and jaded beasts had fairly stopped, loud inquiries would be made on all hands, of driver and passengers, for war news. Somebody would throw down the latest newspaper; somebody would mount a chair and read aloud; and, just as the news was encouraging or depressing, there would be cheering or silence. Then would come the rush for the mail to the post-office across the way.

The passengers, also, were a source of engrossing interest. There was young So-and-so, with his empty sleeve. A year ago he had left the place, and passed safely through all the earlier battles; but at Malvern Hill a grapeshot mutilated his left arm. Amputation followed, and now, after a long time in hospital, here he was, home again, pale and bleached, with an honorable discharge in his pocket, and maimed for life. And there, collapsed upon the rear seat, more dead than alive, too weak to move save with the assistance of friends, was a poor, wan fellow, whom nobody knew at first. How pitiful he seemed, as they helped him forth, his eyes sunken yet restless, his weak arms clinging about their necks, his limbs scarce able to support his weight, his frame racked by paroxysms of violent coughing! "Who is it?" passed from mouth to mouth. "Good God!" exclaimed some one at the whispered reply, "it can't be! That is not Jimmie Thomson. What! Not old man Hugh Thomson's son, down on Pig River? Why, man alive, I knew the boy well. He was one of the likeliest boys in this whole county. Surely, that ar skeleton can't be him!" But it was. The exposure of camp life had done for poor Jimmie what bullets had failed to do.

There, perched gayly in air, and tumbling down upon the heads of the bystanders with joyous greeting, was the sauciest, healthiest youngster in the village, come home on his first furlough in a twelvemonth, wearing on his collar the bars of a lieutenant (conferred for gallantry at Seven Pines), in place of the corporal's chevrons on his sleeve when he marched away. Camp life had made no inroads on his health. The sun and rain had only given him a healthy bronze. His digestion would have assimilated paving-stones. The bullets had gone wide of him. And his little world, the dearest on earth to him,—the little world which had laughed and cried over the stories of his capers and his courage in the field,—stood there surprised and delighted, with smiling faces

and open arms, to welcome him home, their own village boy, their saucy, gallant fighting chap, their hero,—home again, if only for a week!

Each day opened and passed and closed, with its excitements. It was all very narrow and primitive, the out-of-the-way world of the obscure village in an unknown region. Yet in it were the same old hopes and fears and joys and tears, hearteases and heartaches, loves and hates, and all the moods and tenses of human nature, to be found in the most populous and cosmopolitan hives of humanity.

[*Image in original:* Section of the Nine-Sheet Map (1859 edition). *Caption:* The route taken by Wise from Big Lick to Rocky Mount is shown on the 1859 edition of the Nine-Sheet Map.]

The Evolution of Public Transportation in Virginia: The Early Years

Howard H. Newlon, Jr.

["Backsights" No. 59: originally published in the *Bulletin*, February 1980]

In recent years there has been a renewed emphasis on public, or mass, transportation, not only in Virginia but also nationwide. With the exception of railroads, transportation routes can be and have been used jointly for individual or mass movement of people and goods. Past "Backsights" have emphasized roads and bridges, or what would today be classified as "highway" transportation, even though these early roads provided routes for stage coaches, the forerunner of today's intercity buses. But Virginia has a long and interesting history in the area of public mass transportation which will be the subject of this and several subsequent "Backsights."

[*Image in original:* Montage of 19th century transportation methods (wagon, canal boat, sailing ship). *No caption.*]

In 1816, a landmark event occurred in Virginia when the Board of Public Works and the Fund for Internal Improvement were created by the Legislature. The Board, consisting of 10 citizen members representing various regions of the Commonwealth, was the first transportation department in the United States and provided the framework for comprehensive and coordinated transportation planning as well as staff expertise that prior to its creation did not exist. From the time of its creation until it was superseded by the State Corporation Commission with the 1902 constitutional revision, it was responsible for all modes of transportation improvements in Virginia.

Many aspects of the activities of the Board of Public Works have been treated in prior "Backsights." Initially the Board concerned itself with the two primary modes of travel then in use: roads and canals. With the advent of the railroad in the 1830s, an additional mode came under its purview the accommodation of which caused the Board, and particularly its principal engineer, Claud Crozet, great difficulty.

Despite the difficulties of responding to new developments in technology, balancing contending political and geographic factions, and meeting the needs of a rapidly expanding populace, the Board provided a degree of coordination and consistency in transportation planning and construction that had not been possible when transportation had been the responsibility of the General Assembly and county courts.

Equally as important as the creation of the Board was the simultaneous establishment of the Fund for Internal Improvements. The Fund, totalling approximately $1 million, was created by placing in a special trust fund the securities held by the Commonwealth in several existing canal and bank companies. At the time, it was envisioned that the interest from the Fund and receipts from subsequent projects would provide "perpetual care" for Virginia's transportation

system. This was not to be the case, since the need ultimately exceeded the resources, a continuing and present problem.

The geography of Virginia suggested that the state should be divided into four regions: The Tidewater (east of the fall line), the Piedmont (from the fall line to the Blue Ridge), the Valley (between the Blue Ridge and the Alleghenies, and the Trans-Allegheny (westward to the Ohio river, including the present state of Kentucky until 1792). These four were the divisions represented by the Board members. This division, in itself, created some problems, since the political alliances and geography did not always coincide. Richmond, for example, was considered to be part of the Tidewater since it was below the fall line, but on transportation issues its alliances were more closely akin to the Piedmont. In order to appreciate the approach taken by the Board during the nineteenth century, a review of efforts prior to its creation is helpful.

In Tidewater, throughout the colonial period the major transportation arteries were the Chesapeake Bay, four major rivers (the James, York, Rappahannock and Potomac), their tributaries, and tidal waters. The Tidewater composed about ten percent of the total acreage of the state and about twenty-five percent of this area was water. There was little need for roads except to furnish access to the abundant waterways. Such roads as were needed, however, demanded ferries to save long overland trips to the fords of the interior. Between 1702 and 1736, the General Assembly established about 95 ferries. In these laws Virginia first exercised her authority in the regulation of transportation, setting termini, tolls, etc.

By the mid-eighteenth century settlement had extended into the Piedmont and Valley, but the tradition of water travel, gained over a century and a half, persisted. The fall line and the Blue Ridge, however, became barriers to commerce. In the Piedmont were six major river systems—the Potomac and the James, which offered potential connections between the Tidewater and the Valley; the Rappahannock-Rapidan; and the Pamunkey-Mattaponi, which extended the York into the interior; the Appomattox; and the Roanoke. The Rapidan and Pamunkey did not connect with the Valley and thus were of localized interest. The Appomattox extended only through a portion of the Piedmont and was overshadowed because of its proximity to the James. The Roanoke was viewed with ambivalence because its outlet was in North Carolina. Distances between the major rivers were much greater than had been the case in the Tidewater and made overland connections difficult.

Thus to provide connections, the Potomac and the James were looked on as the major hopes for continuing commerce and contact with the Tidewater and the Atlantic Ocean.

Transportation problems in the Valley were to some extent less complicated than those in the other three divisions. Natural outlets were provided by the Shenandoah and Potomac to the north, by the James to the south, and by the Staunton in the southeast corner. While the Blue Ridge offered an initial obstacle, this was bridged in the 1740s by the Three Notch'd Road. Spotswood had proved the potential of an overland connection through Swift Run Gap in 1716 with his "Golden Horseshoe" expedition. Ethnically, the Valley residents were linked to Pennsylvania, but geographically the natural outlet for the Valley from Staunton was northward via the Shenandoah to Harper's Ferry or via the Great Waggon Road to Philadelphia. Thus,

Baltimore and Philadelphia were more easily reached and more attractive than Richmond. This situation was to be accentuated with the coming of the B&O Railroad in the 1830s and strengthened determination by merchants in Alexandria, Fredericksburg, and Richmond not to let the produce of the Valley slip from their hands.

The problems in the Trans-Allegheny were entirely different from those in the other three divisions and were greatly magnified. The mountains not only posed a mammoth barrier to overland travel, but resulted in the waters flowing westward, away from the other parts of the state. An ocean outlet for water transportation would be the Ohio-Mississippi system to New Orleans, with the spectre of French or Spanish influence and control rather than the traditional English alliance to which Virginians were accustomed.

During the colonial period, Virginia had done little to improve the navigation of her rivers, other than to encourage a removal of obstructions. After the Revolution, she was no longer the westwardmost extension of England but the easternmost part of the new group of states. Survival of the Commonwealth depended upon establishment of commercial intercourse between her eastern and western regions.

The acceptance of the natural advantages of river transportation as compared with overland travel caused the legislation affecting the two to vary considerably, even though colonial acts had not differed significantly in theory. The result was that in the post-Revolutionary era, river legislation progressed more rapidly and was directed to more specific projects than that related to roads.

Prior to the creation of the Fund for Internal Improvement there was no comprehensive statewide plan for funding transportation projects. Road improvements were initially the responsibility of the vestry and later the county courts. Each male titheable was required to work on the roads a specified number of days per year. For large projects involving several counties, the General Assembly enacted specific legislation, authorized tolls, or made specific appropriations.

By the time of the Revolution, support for private turnpike and canal companies had developed. In the east, where the population was concentrated, the distances relatively short and the economic base strong, this approach worked reasonably well. In the west, however, private capital could not derive sufficient return from transportation projects so that state funding was required.

Until the Internal Improvement Fund was created, the county courts and the General Assembly struggled with various taxing plans to boost revenues to meet expanding demands, not unlike present political bodies. Between 1783 and 1790, the General Assembly revived colonial legislation which permitted road repairs to be financed through tolls and increases in county taxes and augmented that practice to permit general taxes to be used for road work. No tax was popular and there was considerable opposition to any county tax for roads that did not lie near the taxpayer's residence.

The search for a "painless" tax was perhaps best illustrated by an 1805 proposal for a tax of one percent to be levied on all debts registered at the county courts and the revenue from such tax to be turned over to the state treasurer to be used for road construction. Obviously, this would not have been a very stable funding source had the legislation passed. Throughout this period Virginia was one of the largest users of lotteries for funding public projects.

But the major attention of the state continued to be centered upon development of her rivers. A major champion of river development was George Washington, who as early as 1754 wrote to Thomas Lee concerning the potential of the Potomac as a route for western trade. Interest continued and Jefferson introduced a bill in the House of Burgesses in 1769 to develop the upper reaches of the Potomac. This bill was defeated because of local jealousies, as was a similar bill proposed in Maryland. Washington, Jefferson, and others persisted and with deference to the Richmond merchants in 1772 achieved agreement whereby both the Potomac and the James would be improved. Opposition of the Baltimore merchants continued to stall legislation in Maryland and the private sector funds for the Potomac improvements could not be generated.

The Revolution interrupted these efforts but the groundwork had been laid for a system of funding that was to be the basis of transportation improvements throughout the nineteenth century. This so-called "mixed enterprise" system authored and encouraged private companies to issue stock, a portion of which was purchased by the Commonwealth and for which proportional representation on the Board of Directors of the private company was obtained. In effect, the state and its citizens became partners in transportation improvements. Also during this time the connections of the eastern and western waters became the major focus of state level transportation designs.

Isolation from England immediately following the Revolution combined with the rising commercial importance of the west, and the threat of New Orleans as a market increased the efforts of Washington and Jefferson to push development of the Potomac and, to a lesser extent, the James. The other states were responding also.

In 1783 Pennsylvania announced plans to improve the Susquehanna westward, a move that alarmed Jefferson. He and Washington secured the reluctant support of James Madison. Washington, acting upon Jefferson's request, personally lobbied the General Assembly on behalf of the project. Unlike Jefferson, he did not favor a tax but rather encouraged private development. Jefferson had promoted the Potomac, despite his natural connections to the James, but Washington, recognizing the importance of support from the Richmond merchants, did not advocate development of the Potomac to the exclusion of the James.

On December 4, 1784, Washington's proposals concerning the Potomac were presented to the General Assembly in the form of a petition signed by inhabitants of both Maryland and Virginia. During consideration of the proposal in the House it was resolved that Virginia obviate the predicament of 1772 by sending a commission to Maryland to secure a joint agreement. Washington undertook this task, which led to inclusion of Pennsylvania in the project. The inclusion of Pennsylvania necessitated reaching an agreement with Delaware, and later with New

York and New Jersey. This, in turn, brought about the Annapolis meeting which led to the Constitutional Convention in Philadelphia.

Thus, either consciously or unwittingly, the efforts of Washington, Jefferson and Madison to establish the Potomac Company became an important factor in the move for creation of the federal government.

Paralleling the efforts to improve the Potomac were those of the people interested in the James. Madison, Wilson Cary Nicholas, and Benjamin Harrison prepared legislation for the James River Company. During the remainder of the session the Potomac River and James River bills went hand in hand to the incorporation of the two companies in January 1785. This legislation was the first effort by the state to use the joint-stock company as the agent for works of internal improvement. This culmination of an effort that had spanned more than a decade established three principles that guided the state's transportation development for almost 100 years. These principles were (1) private rather than state ownership in works in which the Commonwealth was vitally interested, (2) assumption by the state of the role of minority stockholder in public works, and (3) identification of a public interest in river improvements that at times exceeded the private interest in these projects and at times challenged the private interest.

The Potomac River Company was capitalized at slightly over $222,000 and the James River Company at $100,000. The numbers of shares were the same and the values of each were set at $444 and $200, respectively. The Commonwealth subscribed to shares equal to one-tenth of the capital of the Potomac Company and one-fifth that of the James River Company. Recognizing that clearing the Potomac would be more difficult than comparable work on the James, tolls were set higher for the Potomac waters.

During the first few months of 1785 interest in the central line (James) lagged but gradually, because it lay within the state and had greater appeal to local consciousness, the work on the James progressed more rapidly. By 1795 the canal was completed around the falls between Westham and Richmond and, in 1800, the locks were opened to the lower basin. This success brought monetary rewards for the Potomac Company, a fact reflected in the value of its stock.

These initial successes centered the attention of the state on its central water line. After 1810 the Commonwealth became committed to the selection of the James rather than the Potomac as its chief route to the Ohio. After the War of 1812, "canal fever" swept the eastern seaboard. It was against this background that the Board of Public Works was created. The situation was reversed from that existing today. Roads were looked upon primarily as local problems, except where they provided connections for the public transportation network, rivers. The principal of these rivers was the James, seen as the vital link to a country rapidly expanding westward.

The Evolution of Public Transportation in Virginia: 1800-1850

Howard H. Newlon, Jr.

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When the final break from England came with the ending of the War of 1812, Virginia, like the rest of the United States, increased the effort to connect the rapidly westward-expanding population with the established commercial and political centers in the east. The creation of the Board of Public Works and the Fund for Internal Improvements in 1816 provided an administrative framework for planning and technical expertise and financial resources that, when supplemented by returns from the completed projects, were believed adequate to provide perpetual funding for building the canals and roads that were then the two transportation modes in use.

To guide financing of projects from the Fund which consisted of stock owned by the state in several banks and navigation companies, four broad principles were established. These principles were (1) that aid for actual improvements would be granted only in the form of stock subscriptions to duly incorporated companies; (2) that only those works which could not be undertaken by private capital would receive aid; (3) that state aid was designed to place particular companies on a sound financial basis and would be terminated when a company was self-sufficient; and (4) that the revenue for improvements would be derived from profits accruing to the state in the form of dividends and bonuses, not from taxes or loans. During the ensuing years, departures from these concepts were made by the legislature working apart from the Fund, but these principles, for the most part, did guide the use of the Fund during the period 1816-1831.

Throughout the nineteenth century, the Board of Public Works had as its mission (1) developing Virginia's resources through internal improvements (canals, roads, and, later, railroads), (2) ameliorating the jealousies and sectional rivalries, and (3) gaining for Virginia the trade of the Ohio and Mississippi Basin.

While these objectives were never completely realized, the Board of Public Works developed and updated comprehensive plans that would have met the goals had it only been able to overcome the sectional conflicts within the legislature. Unfortunately, no unity of purpose could be achieved, with the result that the plans were never adequately funded, and the legislature often diverted the limited funds to projects that were not essential to the comprehensive plan.

Over a period of more than 50 years the plans to connect the eastern and western portions of Virginia had centered on the northern river system and the central river system. The creation of both the Potomac and James River Companies in 1785 marked official recognition of the goal and formed the philosophical foundation upon which the Board of Public Works attempted to build Virginia's system of internal improvements.

The years 1816-18 were extremely prosperous, causing the value of the bank stocks comprising the Internal Improvement Fund to greatly increase. During these two years more than half of the revenue from the Fund was used to purchase more stock rather than for improvements. The recession of 1819, however, brought a drastic reduction in dividends and left the Board unable to meet the commitments it had made in more prosperous times. By 1820, considerable dissatisfaction with the progress on the James River Canal led the state to take over responsibility for improving the waterway by assuming management of the James River Company. Authority to borrow $200,000 was also granted. Work progressed rapidly between 1820 and 1823, but costs proved to be almost three times the estimated expenditures and revenues from tolls failed to pay the interest on the loan. Thus all of the state's internal improvement funds were tied up in a single project that pleased no one.

Responding to the growing tide of dissatisfaction, the General Assembly, in 1823, dissolved the James River Company and placed the administration of the improvements not under the Board of Public Works, but under a state corporation of which the governor was president. Two more loans were authorized. Thus the state found itself in an unexpected experiment in government ownership. Between 1823 and 1831 work on the canal progressed slowly, but the drain on the Internal Improvement Fund was excessive. In 1823, 20.8 percent of the total disbursements of the Fund were used to pay interest on the James River loans; by 1826 this figure had risen to 54.0 percent, and by 1831 it was 68.9 percent. The original concept of a perpetual fund that would finance projects distributed over the Commonwealth was in a shambles. The western portions of the state were particularly hard hit because (1) there were no established companies, and (2) those that tried to form could not raise sufficient capital to meet the Board's criteria for aid. The Board faced a dilemma. It was supposed to fund projects to develop the resources of the west, but without development of these resources there was insufficient local capital to initiate the projects themselves.

[*Image in original:* Painting of a Canal Boat. *Caption:* Canals were an important part of nineteenth-century Virginia's transportation system.]

At the national level throughout this period, the question of establishing a federal transportation system was being debated, raising constitutional questions as to the right of the federal government to establish such a system. This matter had been hotly debated since the Revolution. Most Virginians had opposed the entry of the federal government into this area. Indeed James Madison recalled that those drafting the Constitution in 1787 had considered this question and chosen not to include it. Of equal importance was the fact that with the actions taken in 1816, the state had what it viewed as an adequately funded program. The inability of the state to follow through on its commitments led those interested in western development and the Potomac River improvements to turn increasingly to the federal government for help. Between 1826 and 1830 the Commonwealth authorized but $72,675 for subscription to road and canal companies, while during the same period the United States subscribed $1,150,000 in the stock of Virginia internal improvement companies.

After a decade of haggling, and little progress on projects, the situation came to a climax in the legislature in 1831 when the Board of Public Works was reorganized to eliminate the ten elected commissioners: the role of the principal engineer was downgraded and control placed in

the hands of ex officio directors (the governor, lieutenant-governor, treasurer, etc.). The purpose of the reorganization was to throw the control of administration into the legislature. Technical expertise was sacrificed to satisfying the demands of the constituents rather than progressing on a well-integrated program of public works. The consequence of the reorganization became apparent in the decade of the 1830s, when Virginia launched a new program of increased expenditures and accompanying indebtedness. Soon after the reorganization of the Board of Public Works, the state divested itself of its interest in the central water line and turned the administration of the works over to the James River and Kanawha Company, which was chartered in 1832. As it turned out the new company was able to extend westward, but was no more able to reach Covington than had been the state agency.

[*Image in original:* Map of the James River and Kanawha Canal and the Kanawha Road. *Caption:* The route of westward expansion during the nineteenth century.]

It is perhaps ironic that the reorganization of the Board of Public Works in 1831 occurred less than one year after Peter Cooper's diminutive *Tom Thumb* steam locomotive traveling over the B&O Railroad in Maryland won the race with a horse-drawn train. Now, it was not only a question of which route deserved attention and funding, but also of what mode of improvement was best: railroad or canal.

As early as 1808 Benjamin Latrobe had stated that one of the few practicable routes in the U.S. for a horse-drawn railroad was between the Midlothian coal district on Falling Creek and Ampthill on the lower James. In 1825, a group of Richmond citizens requested that the General Assembly charter a railroad to run from the reaches of Falling Creek to the James above the falls. The obvious effect of this would be to secure the coal trade for Richmond rather than have it bypass the capital and end up at Norfolk. This action was delayed until Crozet surveyed the route in 1827. This survey was the only aid provided by the state, since the profitability of coal mines drew sufficient private capital to fund the project.

As early as 1815, while the legislature was considering formation of the Board of Public Works, suggestions were made concerning a railroad (horse-drawn) connection of the eastward and westward flowing rivers. These suggestions continued to be made. One major supporter of a rail rather than canal connection between Richmond and Covington was Moncure Robinson, a former engineer for the state. In 1826, Crozet compared the rail versus canal connection and opted for the latter as least expensive. By 1830, however, with the practical demonstration of the steam locomotive, Crozet saw the potential of such a plan. Opposition from the supporters of the James River Canal blocked such a project and forced Crozet's resignation as principal engineer.

In 1827, the Maryland legislature incorporated a company to build a railroad from Baltimore to the Ohio. The Virginia Legislature supported the measure but made the very important reservation that the route must traverse Virginia on a route north of the Little Kanawha River, thus protecting the James-Kanawha Canal route. Attempts to change this limitation continued to be blocked by the James River interests. Residents of the Valley and Trans-Allegheny vainly pressed for connections from their towns to the B&O.

In 1830, the General Assembly granted a charter to the Petersburg Railroad Company for constructing a line from the Appomattox to the North Carolina border and thence to the Roanoke River. The state initially provided no aid but authorized the city of Petersburg to subscribe to stock in the company. In 1831, the Board of Public Works subscribed to stock in the company.

Because construction of the Petersburg-Roanoke River connection was a stroke at Norfolk and the Dismal Swamp Canal, it was opposed by representatives from the Tidewater. Their opposition was unsuccessful, but in 1832 a charter was granted for a railroad from Portsmouth to the Roanoke River and the state subscribed to stock for it. Thus, to satisfy the demands of local interests, the state had invested in two competing north-south lines, one of which was bound to fail, and ignored the much more critical east-west connection.

Despite continued efforts by the state to salvage the Portsmouth-Roanoke River line, it was sold to the Seaboard Railroad in 1846. No further state aid was given to this line.

During the 1830s and 1840s numerous suggestions were made and charters granted for railroads in Virginia. Few were successful because of (1) the strength of the canal interests in the legislature, which blocked potentially profitable routes; (2) lack of private capital in the western areas to fund projects with no important Tidewater connections; and (3) the recession of 1837. Routes that connected with the established Petersburg-Roanoke River line achieved relative success, whereas railroads planned as offshoots of east-west lines passed out of existence because of the failure of these lines to materialize. With the exception of a line between the Clover Hill mines and Chesterfield, which was a branch of an existing line, no railroad companies were chartered and organized between 1837 and 1854. In 1834, Virginia had but 90 miles of railroad and ranked fifth in the nation. During the next 2 years, 150 miles were constructed by companies in which the state had an interest. Only New York built more railroads during this period, placing it second in the nation. In the ensuing nine years, however, Virginia built less than 150 miles.

Primarily through the efforts of the residents of the fall line cities—Fredericksburg, Richmond, and Petersburg—several major attempts at east-west rail connections were initiated in the 1830s which did not fully materialize until the 1850s. One of these was for a line between Lynchburg and Tennessee. In 1830, inhabitants of Campbell County had secured a charter for a railroad between Lynchburg and the New River. This was not opposed by the canal interests, because it would serve to connect the canal at Lynchburg with the rich mineral and agricultural regions of southwestern Virginia. The same motive had led to the incorporation of the Lynchburg and Salem Turnpike Company in 1817. Unable to raise the necessary funds, the Lynchburg and New River Railroad Company abandoned its plans in 1832. In 1836, another company, the Lynchburg and Tennessee, was chartered. This ambitious project proposed a line from Richmond to Lynchburg as well as the Lynchburg-Tennessee connection. The sudden acquiescence of the state to a line that would compete with the canal was caused primarily by the promotion by South Carolina of a line from Charleston to Cincinnati. Adverse financial conditions delayed subscription to the Lynchburg and Tennessee. It was not until the latter half of the 1840s that the project progressed at all, and then only by several companies constructing a noncontiguous line with broad gaps between the termini. Plans for the Lynchburg and

Tennessee improvement encouraged significant movements for other railroads in the Commonwealth which at the time were unsuccessful but later, in the 1850s, were revived.

One localized project that was successful and later took on added importance was the Louisa Railroad, chartered in 1836. The plan was to construct a line between the Richmond, Fredericksburg and Potomac, that had been constructed in 1832, from a point near the North Anna River to Gordonsville. The Board of Public Works had hoped to later connect the Louisa with the Rappahannock and Blue Ridge at Gordonsville, and then use the latter railroad as a connection across the mountains and southward in the Valley to Harrisonburg and Staunton. This plan didn't materialize, because only the Louisa was able to obtain the private capital.

Construction of the Louisa proceeded rapidly and was completed to Gordonsville in 1840. Plans were immediately made to extend the line to Charlottesville. This extension was completed rapidly and the company resolved, in 1845, to extend the line from Gordonsville to Harrisonburg with a view toward extending its track to the Ohio. The project was not carried out, but by 1848, at least the state had made plans for two lines between east and west; one on either side of the James River. But the financial panic of 1837, coupled with the large debt represented by the James River bonds, severely curtailed the ability of the state to fund internal improvements. Between January 1, 1837, and December 31, 1846, only two railroad companies were chartered, neither of which were of major importance. Beginning in 1847, however, the Richmond and Danville incorporated the first of a series of railroad companies for which the state was soon to severely strain her financial resources. In 1849, the state began construction of its own railroad, the Blue Ridge, which was to extend the Louisa, now the Virginia Central, westward into the Valley of Virginia. Surprisingly, even as late as 1850 there was still no direct north-south connection between Richmond and Petersburg, or between Richmond and Alexandria.

As part of the constitutional revision of 1850, the Board of Public Works was reorganized. The new Board had three elective members with longer terms than their predecessors and no additional duties. John Buchanan Floyd of Washington County, who took office as Governor in January 1849, served as president of the Board. The state was set to begin a major railroad building era with the election of Floyd as Governor. One optimistic writer saw the state reawakening from "a fifty year's nap of stultification."

The Evolution of Public Transportation in Virginia: The Railroad Era 1850-1900

Howard H. Newlon, Jr.

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The constitutional reorganization of the Board of Public Works in 1850 culminated several decades of dissatisfaction with Virginia's program of internal improvements, particularly on the part of the residents of western and southwestern Virginia. Despite the state's avowed commitment early in the nineteenth century to linking the eastward and westward flowing rivers for transportation of people and goods, the project had floundered, in part due to periodic nationwide financial panics but primarily because the legislature was unwilling to impose the necessary taxes and unable to overcome sectional rivalries. The result had been that after authorizing important and ambitious projects, the legislature, responding to local pressures, had usually curtailed funding, thus defeating its own aims. The Board of Public Works bore the brunt of the criticism resulting from the legislative vacillations.

Although much rhetoric and considerable sums had been directed toward the objective of linking the fall line with the Ohio River, by 1850 the results were sparse. The James River and Kanawha Canal was operative only to Lynchburg. There was no rail connection between Richmond and Southside Virginia. The rail connections between Richmond and Petersburg to the south and Richmond and Alexandria to the north were interrupted by a gap through the capital city. In addition, the northward rail route ended at Aquia Creek, thus requiring the use of a steamboat to reach the Potomac towns. The only east-west routes were (1) the Louisa Railroad's connection between the Richmond, Fredericksburg and Potomac near Doswell in Hanover County and Charlottesville, and (2) the Southside Railroad, initiated to connect Petersburg and Lynchburg via Farmville. By 1850 the line was being completed between Farmville and Lynchburg. Charlottesville was also connected to Alexandria via the Orange and Alexandria.

The only continuous connections between Tidewater and the Ohio River were by way of the canal and connections with two major turnpike roads, the Staunton and Parkersburg on approximately the modern route of U.S. 250, and the Kanawha along today's route of U.S. 60. The Southwestern Turnpike provided access between Bristol and Buchanan, where it joined the Kanawha Turnpike. Buchanan was the town toward which the James River and Kanawha Canal improvements were slowly progressing from Lynchburg.

The line of the Baltimore and Ohio between Parkersburg and Harper's Ferry provided an eastward connection for the Trans-Allegheny inhabitants, but was viewed by most as a negative rather than a positive factor since it encouraged trade with Baltimore rather than Richmond and Norfolk.

But Governor John B. Floyd was dedicated to a revitalization of the efforts to complete the coordinated statewide transportation system. The decade prior to the Civil War saw

significant progress on many of the intermediate links within the system but failures for its major components.

Since the Louisa Railroad had made the most successful effort toward its objective by extending its line to Charlottesville, it was singled out for the major thrust through the Blue Ridge. But the Louisa Railroad Company balked at constructing a railroad through the mountains because of anticipated difficulties and expense. Finally, when no private enterprise was willing to extend the line, the state formed the Blue Ridge Railroad Company on March 5, 1849, to construct the line between Blair Park, near Mechum's River in Albemarle County, and Waynesboro. The route, approximately 17 miles long, would pass through four tunnels. The Louisa Railroad Company agreed to build the line between Waynesboro and Staunton with the agreement that the state would then turn over the mountain connection to the private company.

To superintend the tunnel construction, the state once again called on Claud Crozet, whom it had fired in 1831 when he advocated abandoning the James River Canal in favor of constructing a connecting railroad between Lynchburg and the Ohio River.

Crozet pursued the work for almost seven years. The major tunnel at Afton, recently made a National Civil Engineering Landmark, with a length of 4,273 feet, was the longest in the U.S. when completed in 1857. The second longest was the Pennsylvania Railroad Allegheny Tunnel, which was 3,612 feet long. The record was short-lived, however, because soon after the Afton Tunnel was opened the Blue Ridge Railroad Company of South Carolina finished its 5,864 foot tunnel through Stump House Mountain.

[*Image in original:* Crozet's Tunnel. *Caption:* Crozet's tunnel at Afton was the longest in the U.S. when it was completed in 1857. Photo courtesy of the Virginia State Library.] *[NOTE: The "Virginia State Library" is now the Library of Virginia.]*

While work was proceeding on the tunnel, the Louisa Company, which in 1850 had become the Virginia Central Railroad, was reluctant to undertake the extension to Covington and thence to the Ohio River. In 1850, the General Assembly authorized the Virginia Central to increase its stock in order to continue the line and subscribed to $150,000 worth of stock, but at the same time it threatened to establish a new company, the Staunton and Covington, if the Virginia Central refused. The Virginia Central took advantage of the funding, but extension beyond Covington was another matter.

Plans to extend the railroad to the Ohio River reawakened the opposition of the James River interests that feared that the trade of the west would be drawn over the Virginia Central and the Orange and Alexandria to Baltimore. The state, in order to placate this opposition, as well as that from the Baltimore and Ohio Railroad advocates, directed that the western terminus be located so as not to interfere with either of these facilities.

The incorporation of the Covington and Ohio Railroad Company on February 13, 1853, marked a climax in the history of Virginia's internal improvement program to link the Chesapeake Bay and the Ohio River. The legislature authorized funds in 1853, but the next

session of the General Assembly failed to provide additional funding. By 1857 funds for the project were exhausted. Failure of the legislature to support this project was viewed with despair by western residents, who saw a repeat of the canal experience which had dragged on for decades. Despite numerous conventions and resolutions of support, a number of forces combined in opposition to the point where western Virginians who, over the years, had been made dependent upon Baltimore and the north by Virginia's failure to provide eastward routes, in 1856 themselves voted against the bill to authorize further funding. The seeds were sown for the separation of what later became West Virginia.

While the major effort to reach the Ohio River by railroad or canal was a failure, the 1850s saw considerable progress toward connections with the south and southwest. These included completion of the Richmond and Danville Railroad, the Southside from Farmville to Lynchburg, and the Virginia and Tennessee between Lynchburg and Bristol.

After completion of the Virginia and Tennessee, opposition to expenditures for work on the Southwestern Turnpike grew on the grounds that the railroad would render the turnpike useless. In spite of these fears, the completion of the railroad was accompanied by increases in revenues from tolls on the turnpike between 1851 and 1853. Similar increases occurred on the Northwestern Turnpike that competed with the Baltimore and Ohio, whereas tolls on the Staunton and Parkersburg, which had no competition, declined.

In 1850, the Tredegar Iron Works in Richmond began production of locomotive engines and in five years turned out more than 30 engines. To overcome the gap in the north-south line at Richmond, the General Assembly, in 1850, authorized an experimental street railway to connect the two existing lines. A sum of $10,000 was authorized. The Richmond city council objected to the plan, so a site in Chesterfield County "a short distance from the south end of the Richmond and Petersburg railroad bridge" was selected for the experiment. In his report to the Board of Public Works dated November 5, 1850, James French reported that he had received about half of the authorized amount, with which he had built an engine, purchased rails, and worked on the bed. He indicated that he expected "to be ready for the experiment by the meeting of the legislature." No further report on this project has been found.

The Civil War had a devastating impact on the state's transportation facilities and its financial resources to improve them in the years immediately following the war. Poorly recovered from the ravages of war, the canal was hit by massive floods in 1870. Also in 1870, railroad president (and former Confederate general) William (Billy) Mahone consolidated his three lines—the Norfolk and Petersburg, the Southside, and the Virginia and Tennessee—into a single company, the Atlantic, Mississippi and Ohio Railroad, with which he hoped to connect Norfolk and Memphis. Because of suspicions generated out of his political maneuverings and opposition from northern railroad interests, his efforts did not succeed. The AM&O was forced into bankruptcy in 1876. Five years later, it was reorganized under new management as the Norfolk and Western.

In order to facilitate his consolidation, Mahone had persuaded the General Assembly to sell the Commonwealth's stock in his three railroads. Not only did the state sell the stock as

requested by Mahone, but also divested itself of all railroad stock except that held in the Richmond, Fredericksburg and Potomac.

During the 35 years following the Civil War the railroads of Virginia took on the form familiar during the twentieth century. In addition to the formation of the Norfolk & Western in 1881, the Virginia Central had earlier evolved into the Chesapeake and Ohio, including the extension between Covington and the Ohio River, which had finally been completed in 1873. In 1880, the Chesapeake and Ohio absorbed the Richmond and Allegheny, which had been built along the tow path of the James River and Kanawha Canal. This gave the C&O an alternate route between Clifton Forge and Richmond via Lynchburg rather than Charlottesville. Extension of the line eastward from Richmond to Hampton and Newport News signaled significant growth for that portion of Tidewater.

The Richmond and Danville gradually gained control of a number of short lines to provide a direct route from Atlanta to the north. Following bankruptcy in the financial crash of 1893, J. Pierpont Morgan reorganized the company as the Southern Railroad.

The emergence of the railroads coincided with efforts to exploit Virginia's mineral wealth and to industrialize the state. These efforts led to extensive land booms and creation of "instant cities," often with extensive backing from railroad interests. This phenomenon has been treated in previous "Backsights" articles.

There was still a problem with rail transportation that resulted from their initial construction as independent lines. The different gages, or track widths, meant that goods and people had to be transferred where tracks of different widths met. As connections beyond the state boundaries developed, this became an even greater problem. Cooperating in a nationwide effort, on June 1, 1886, the gages of all railroad lines in Virginia were reset to a standard width of 4 ft. 8½ in.—a herculean effort of organization.

Travel and communications to distant points required standard schedules. As a result, in 1883 the railroads established the nation's four standard time zones. Eastern standard time was adopted for all of Virginia except its western tip, which used central standard time until 1947.

The major efforts had been toward public transportation and were directed toward statewide movement of people and goods. But there were also significant local efforts. Richmond, in 1888, initiated the first commercial electric street railway in the U.S. It was designed by Frank J. Sprague. While there had been electric lines before 1888, Richmond's was the first successful and reliable system. Representatives from other cities, such as Boston, impressed by Sprague's success, scrapped plans for cable cars and went for the electric "trolley."

In retrospect, Virginia was never able to fulfill the promise accompanying the creation of the Board of Public Works in 1816. However, the existence of this body, providing technical and planning expertise, did result in the establishment of a coordinated base from which public transportation evolved.

Although speculation is obviously risky, there are a number of questions that might be asked. What if Sprague had not successfully operated his electric trolley? Would Boston, like San Francisco, have cable cars? If a successful connection between Tidewater and Western Virginia had been made in the 1830s, would there be only one Virginia today? What if the Civil War had begun in 1850 when there were no railroads west of Charlottesville? Would it have lasted for five years?

The history of public transportation in Virginia, like its recent past, has been one of recognized need, inadequate resources, sectional rivalries, and conflicting motivations. Hopefully, the twenty-first-century writers of "Backsights" will be able to look back upon our efforts as meeting these needs to the greatest extent possible.

The Rivanna Navigation: Almost a Canal System

Nathaniel Mason Pawlett

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The ultimate improvement to which a navigable river can be subjected is conversion into a canal. First comes the natural river; at high water perhaps navigable over most of its length, at low water presenting obstacles to navigation at certain points. To overcome these obstacles sluiceways or swing gates are built to constrict and deepen the flow of water in a channel through which boats can then pass. Sometimes a lock or series of locks will also be constructed where a large fall exists in the river.

The next step in improving a river for navigation will be to straighten it in places by building artificial channels or canals across bends or through long, curled sections. This step might also include deepening existing channels and constructing more locks. If this process is carried far enough, the portions resulting from new construction will exceed the natural portions of the river remaining in service. If the river is slow-moving and flowing through relatively flat country, it might be quite literally “canalised” or turned into a canal, with all its flow restricted to use by the locks and mills along the route.

Such was the fate of several English rivers. From this level of river modification, it is a simple step to building a true canal to go around a difficult section of river as was done in Britain for the first time between 1564 and 1566, when the Exeter Canal was constructed. Only 1¾ miles long and 16 feet wide, it had Britain’s first true locks, although they had vertically rising gates. Several canals of this type were constructed in Britain in the century after this. The logical next step was to build canals which branched out from the population centers on navigable rivers into the hinterland, and canals which connected the heads of navigation of two rivers. Finally, there began to be constructed those canals which owed little or nothing of their existence to a river running near by.

While no rivers in Virginia seem to have been “canalised,” all of this English experience with river navigations and canals was well known to the Virginian gentry, and in the time before the invention of the steam railroad, canals, and river navigations seemed to offer the principal hope for efficient, rapid (by the standards of the time) transportation of goods. This became more than a hope in the 1740s with the effort to improve the upper James River for navigation (treated in another “Backsights” article on Robert Rose) and continued into the 1780s, culminating in the scheme to improve both the James and the Potomac rivers. In turn, this led ultimately to the conversion of these river navigations into canal systems.

Not so well known is the involvement of Peter Jefferson, the father of the President, as one of the trustees designated by the General Assembly, in the work on the James, and the involvement of his son Thomas, as a very young man in the 1760s, in the clearing of the Rivanna River for navigation from near Monticello to its juncture with the James. In 1763 Thomas began this effort, subscribing along with others some 200 pounds toward these improvements and

hiring men to survey the river and complete the work necessary to make the river passable for batteaux and canoes. This work probably consisted of the removal of debris and the creation of channels or sluices by the removal of rock and gravel at falls and shoals. Jefferson always considered this a major achievement and it headed a list of his "undertakings" he made years later.

Water transportation then being one-sixth to one-tenth as expensive as wagon carriage of goods to market, it was not surprising that a town called Milton was shortly established at the head of navigation about 5 miles east of Charlottesville, and began to draw wagon traffic from as far away as the Shenandoah Valley. Other towns also flourished along the river, from Columbia at the mouth to Palmyra, Union Mills and Bernardsburg upstream. With the establishment of these towns dependent on the river as a transportation link, the pressure for further improvements grew. In 1805 the Rivanna Navigation Company was chartered. Thereafter, at intervals, the river was subject to improvements of an ascending order, until by the 1850s it approached the status of a canal.

[*Image in original:* Detail from the Nine-Sheet Map. *Caption:* The Rivanna River from the Nine-Sheet Map (1859).]

Three phases of this are evident: one about 1810, another in the 1830s, and still another in the 1850s. The first phase, begun in 1810, seems to have concentrated on further improving the river itself, by straightening and deepening sluices and building wing-dams to divert the river through these at more than 27 falls, shoals and fords from Milton down to Columbia, a distance of about 33 miles. At many places in the river traces of these can still be seen, even though they were abandoned in the 1930s. Improvements continued above Charlottesville too, reaching as far as Hydraulic Mills on the South Fork of the Rivanna and Brook Mills on the North Fork. Since several mills now existed on the river, locks were at these to allow boats to pass the dams. These were of wood rather than stone: three at Thomas Jefferson's Shadwell Mill, one at Campbell's Mill at Buck Island in Albemarle, one at Union Mills in Fluvanna, one at Palmyra, and one at the Rivanna Mill about 5 miles above Columbia. At Shadwell, Union Mills, and Rivanna Mills, there also were short canals. Always depending upon the level of the water, navigation was usually possible from near Charlottesville to the mouth of the river at Columbia.

It was still very much a river navigation rather than a canal, however, with tobacco and flour-laden canoes and batteaux being poled along to their destinations. From Columbia they could continue down the James to Richmond.

With the 1830s and increased economic growth in Virginia came the realisation that the existing system of sluiceways was inadequate. Low water was always a problem encountered at certain times of the year, when a conflict arose between the needs of the mill owners and the users of the canal. These difficulties led to the building of canals and locks at several new locations along the river for a total of 14 dams and 19 locks (including those already existing at the mill dams). Most of these were still crib-dams and crude timber-lined rough masonry locks. The existence of some of these new dams caused the erection of mills at them, further complicating matters.

All of these were only part of the evolution of the canal along this route, for in the 1850s the Rivanna Navigation Company engaged in yet another rebuilding of its facilities. There were many reasons for this. By 1840 the James River and Kanawha Canal was open as far as Lynchburg for travel by large horse-drawn freight and packet boats. These passed Columbia and crossed the Rivanna on a multi-arched stone aqueduct. While canoes and batteaux from the Rivanna could use the canal to Richmond, the James River Canal boats could not go up the Rivanna to Charlottesville because there was no towpath and the locks were too small. Nor was there yet any direct water connection at Columbia; traffic from the Rivanna had to descend the James ten miles to Cartersville to enter the canal through a lock. Besides this, the railroad had reached Charlottesville in the 1840s.

Thus, faced with obsolescence from two directions, the Rivanna Company decided it was time to modernise its facilities. The James River Company agreed to make a connection possible at Columbia, if the Rivanna Company would complete similar works as far as Charlottesville. In 1851 this "Rivanna Connexion" consisting of a 4½-mile canal, two locks and two culverts was completed. The Rivanna Company built seven stone locks, six miles of canal, twenty miles of towpaths, and a dam, as well as completing a general rebuilding of other lock gates and dams along the way to Charlottesville in order to allow the James River line's boats to use it.

All of these works were of high quality stonework and are visible today to hikers and canoeists along the river. By 1854, towpath navigation was possible up to the Fluvanna County line, where work was suspended for lack of funds. Following the War for Southern Independence, through which the Rivanna Navigation Company seems to have sustained little damage, the flood of 1870 damaged it severely. Money was borrowed for repairs, and Fluvanna County voted $10,000 and Albemarle $20,000 for the repair of the navigation facilities and their extension. Whatever was done, by 1880 the James River and Kanawha Canal was itself out of business, with a railroad being constructed along its towpath.

After the railroad's completion to Columbia in 1880 freight sent down the Rivanna by boat was transferred to it for shipment to Richmond. The railroad company, for its part, agreed to maintain the 4½-mile "Rivanna Connexion" and, if it was discontinued, to build a branch line to replace it, but the navigation system itself gradually decayed. In 1908 the Virginia Air Line Railroad (this was recently taken up) was built from near Gordonsville by Palmyra to Bremo Bluff, following the river for only a short distance. The construction of the railroad caused a short burst of activity on the Rivanna, as ties and rails for the new line were brought up it. But by about World War I, its reason for existence was gone, killed by the railroad and the growing popularity of the automobile.

Strangely enough, for a few years in the 1880s a steamboat of sorts actually operated on the Rivanna River. Although Colonel Thomas Jefferson Randolph, the President's grandson, had in 1844 at a meeting of the directors made a resolution that the feasibility of this operation be investigated, nothing seems to have come of it. Years later William Ronald Cocke, Jr., mounted a steam engine and paddle wheels on an 80-foot boat and operated it on the river. It sank about 1890 during high water, but its timbers are still visible.

It has been said that the past is another country to which we have no passports and in which we have no right of abode. Perhaps. But the well-preserved structures erected by the Rivanna Navigation Company still line the river, relics of an age when water transportation was king. Buried in sand or covered with vines, their mute splendor still testifies to the resourcefulness of the eighteenth- and nineteenth-century Virginians who erected them. The Rivanna was a river navigation which never quite turned into a full-fledged canal. Yet, as such it is still the principal historical navigation system to survive undisturbed in Virginia. Others, such as the James River and Kanawha Canal, have been altered or destroyed in the name of progress or, constructed of more temporary materials, have fallen prey to the ravages of time. Meanwhile, nothing disturbs the pristine stillness of these monuments as the river flows silently by them and down to Columbia.

The Willis: Only a River Navigation

Nathaniel Mason Pawlett

["Backsights" No. 63: originally published in the *Bulletin*, June 1980]

The May 1980 "Backsights" ("The Rivanna Navigation: Almost a Canal System") discussed the development of a river navigation which almost (but not quite!) turned into a canal system. Technological obsolescence, caused by the appearance of the steam railroad, overtook it with the transition half completed. Most river navigations in Virginia, however, did not progress so fast or so far. One which, for a variety of reasons, did not was the Willis River navigation of Cumberland and Buckingham Counties.

The Willis River is a relatively small and slow-moving stream that heads south and west of Willis mountain in Buckingham County. From there it flows some 40 miles northeast, by Curdsville in Buckingham County and Ca Ira in Cumberland County, both once-thriving towns and ports on the river navigation, into the James River near Cartersville. Throughout the nineteenth century tobacco and other produce was brought to these ports and other landings along the Willis to be transported by batteaux to the James and thence to Richmond for sale.

[*Image in original:* Detail from the Nine-Sheet Map. *Caption:* The Willis River from the Nine-Sheet Map. Mill locations are marked by asterisks.]

These batteaux were sturdily constructed, double-ended wooden boats about 60 feet long and 8 feet wide. They were of shallow draft in order to be able to navigate the rapids in the upper reaches of such rivers as the Willis. They were propelled by the river current going downstream and poled up-stream by boatmen with iron-tipped poles. These poles came in different lengths for use in shallow water, deep water, and canals. Detachable rudders were also available when it was necessary to guide the boat through difficult rapids.

In order to allow these boats to navigate the Willis, many improvements were necessary. Short canals were dug across some bends in the river while in other places the channel itself had to be straightened. Locks also had to be constructed at various places to allow navigation where the construction of sluices did not suffice. These were, however, not the usual large, stone built locks found along canals and at milldams. A description of them exists in a plan for the improvement of the Buffaloe River at Farmville:

> It is intended to use the plan of Willis's River, in which each lock consist of jetties extending from both shores toward each other, leaving between them a sluice (channel) of suitable size and construction to be closed by a gate turning around horizontal hinges: this being raised to hold up the water of the stream, is let down for the passage of boats, which are either carried down by the rush of the current; or, if ascending, must be pushed up against it, when its first impetuosity has somewhat diminished. This mode of improvement suits only rivers which afford but a small body of water, such as can flow through a sluice that may be closed by a light gate. The scarcity of water in such streams requires, that several boats should be held ready to rush at the same time through the sluices, during the temporary flood and swell produced by the water that had been accumulated while the gates were up. This system of navigation is evidently applicable only to a

> descending trade; and it seems to be the most expedient that can be adopted for the present on Buffaloe river, which is well calculated for it; and where it promises to be as advantageous as it has proved on Willis's river.

These navigation facilities remained in use about a century, although they were rebuilt several times due to the temporary materials of which they were constructed.

In 1774, just before the Revolution, the gentlemen justices of Cumberland County appointed a committee to take up a subscription for the clearing of the Willis from its mouth to its forks above Ca Ira. A year later the river was reported as still "not cleared sufficient for navigation." The Revolutionary War then intervened, but efforts were renewed afterward and in 1787 the General Assembly passed "An act for opening and extending the navigation of Willis's River." By this act Cumberland County was to take up a subscription for the improvement of the river to where it would allow the navigation of craft capable of carrying twelve hogsheads of tobacco. Probably unrealistic, this qualification was later amended to four hogsheads. The act decreed that when the navigation was operational the river would be divided into districts under "surveyors," each with a "gang" in the manner of county road maintenance. Those "labouring male titheables" assigned to work on the river were exempt from working on the county roads.

The act also contained the usual clause requiring all milldams along the river to construct and maintain navigation locks. The mill at Ca Ira may have been the only one affected by this clause, since most of the others seem to have been on side creeks which flowed into the Willis. This was fortunate since other river navigations encountered great difficulties over this and the question of who had rights to the impounded water. Still other laws forbade the felling of trees across the river for use as footbridges.

The next mention of this act occurred in 1797, when the trustees appointed finally reported that the navigation had been completed. Eleven districts were then set up and surveyors and gangs appointed for each. In 1801 a Principal Surveyor, to have charge of the whole navigation, was appointed according to the act. Perhaps about this time, the navigation was extended to Curdsville in Buckingham County, for in 1798 commissioners had been appointed to survey the river above the fork.

In 1814 and in 1816 petitions again requested that the river be opened for navigation. Perhaps this was a result of the War of 1812, but by 1820 the river was once again in operating condition. In 1853 another petition requested funds for the improvement of Willis's River, no doubt a result of the existence of the James River and Kanawha Canal and the construction of an inlet lock from the James at Cartersville for the trade from along Willis's River. Perhaps the decay of the existing facilities also figured in this.

Boats continued to navigate the Willis River until at least the late 1890s. After the canal was replaced by the railroad along the James River in 1880, produce from along the Willis River was transshipped to it at Cartersville. With the decay of the drop-gate locks, navigation began to be restricted to the lower part of the Willis and to times when the water level was high. The channel was still kept clear, however.

Little remains today of the Willis River navigation facilities. Unlike those on the Rivanna, most of the improvement were built of temporary materials and have long since disappeared from view. Here and there a man-made channel may still be detected along the river, and a few miles still stand along its side streams. Only a river navigation, most of it has now reverted to its primeval condition, inhabited by an occasional fisherman and the ghosts of the departed boatmen.

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Chessie's Parent: The Louisa Railroad Company

Nathaniel Mason Pawlett

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While Virginia's early transportation efforts grew out of the eighteenth century belief in the efficacy of canals and river navigations (and turnpikes) and the Anglo-Virginian experience therein, new technology did not go unnoticed. The advantages of railroads were quickly seen by such people as Claud Crozet, although implementation of his farsighted policies was to lag at the state level. At first seen as being merely complementary to water transportation, railroads were soon noted to obviate such problems as low water, floods and conflicts with millowners.

With this lack of unitary thinking with regard to railroads in the early days, it was not surprising that development was conceived in terms of rather short, locally oriented lines financed largely by coalitions of people who lived along them and by the merchants, millers and others located at their terminals who wished to tap the trade of the hinterland. Then, too, some areas simply lacked access to water transportation. For these, railroads or turnpikes were the only available answer. One of these was Louisa County, landlocked between the North and South Anna Rivers, neither of which seems to have been navigable.

The Louisa Railroad, chartered in 1836, seems to have been one of the more successful of these short lines. Leaving a depot in Hanover County, it had been extended as far as Charlottesville by 1850, when it became the Virginia Central Railroad. Severely damaged in the War, it became the Chesapeake and Ohio in 1867 and, more recently, the Chessie System. No one in the 1830s, however, had such great expectations. Instead, it was thought that it would be a way to market for the tobacco and wheat of Louisa County, as well as a railroad connection with the upland turnpikes and stage lines. Beginning at Taylorsville in Hanover County, the line was initially built westward to Frederick's Hall in Louisa County, and later to Louisa Court House and to Gordonsville in Orange County. Moncure Robinson of the Board of Public Works was commissioned to survey the route. He recommended that the route be run along the ridge between the Little and the North Anna Rivers, where no excavation in rock would be necessary. With this information on hand, the General Assembly granted a charter on February 18, 1836.

Outstanding supervision was provided by members of the Hanover-Louisa gentry. Frederick Harris of Frederick's Hall, a graduate of The College of William and Mary and former member of the General Assembly, was the first president, overseeing its incorporation and construction. Upon his death in 1842, he was replaced by Charles Kimbrough, one of the original stockholders and directors; Edmund Fontaine followed him in 1845, and held the post for twenty years. Annually elected, the directors included such luminaries as James M. Morris, a large planter from the Green Springs in Louisa County; David Anderson, another important Louisan; Dr. James Pendleton, a Louisa County physician; and William Overton, another Louisa planter of means.

The first phase of construction saw rails laid to Frederick's Hall, a distance of twenty-one miles. After the company had sold three-fifths of its initial stock issue of $100,000 the Board of Public Works bought the remaining two-fifths. Since construction costs were greater than anticipated, leaving little money for the purchase of rolling stock, an agreement was effected with the Richmond, Fredericksburg and Potomac to use its rolling stock. It would be 1847 before the Louisa would buy its own engines and cars. Initially, the company engaged subcontractors for its construction, while maintenance crews were composed of slaves and hired farmhands. As early as 1838 the company hired 400 slaves, but after 1847 a much larger force was needed to maintain the new rolling stock and the right-of-way. On December 10, 1837, the first section of the Louisa line opened with great festivities and an inaugural run over the completed line. *The Richmond Enquirer* waxed enthusiastic.

> Who ever expected to see a Railroad in Louisa? Who could have predicted that in our day an improvement would be made, which could transport us over so much space, in so short a time? Fifteen or twenty miles an hour, with as much comfort on a winter's day, as if we were sitting at our own firesides in our own parlours?

Progress, the bane of the Victorians, had arrived.

Hardly had the last spike been driven before an extension westward to Louisa Court House and up the ridge to Gordonsville was planned. By 1840 this had been completed and the next step was being debated. Whether to build by way of Barboursville, Stanardsville and Swift Run Gap or Charlottesville and Rockfish Gap was the question. The latter route was chosen, and Colonel Thomas Jefferson Randolph, the President's grandson, to complete it. The greater role of the line was now coming to be realised. The General Assembly on February 2, 1850, changed its name to the Virginia Central Railroad Company.

Over the years the company had reported a profit each year due to its careful management. Capital stock had reached $700,000 by the time the road reached Charlottesville in 1850. Construction costs had ranged from $8,500 a mile for the first section to Frederick's Hall, down to $7,500 a mile (Louisa to Gordonsville) and $6,000 (T. J. Randolph's construction from there to Charlottesville). Now, with the conversion to heavier T-shaped rail, costs rose to $10,000 per mile. Total receipts for the first sixteen months amounted to $14,500. In 1844 they were $40,424.08; in 1850 they were $91,078.83. In 1840 the fare was 8½ cents per mile, in 1850 it was 6 cents a mile. Freight charges at first ran 10 cents per ton per mile. Charges later were differentiated according to the goods carried, with 15 cents a ton mile being charged for wheat. Freight rates were reduced in 1850 to stimulate trade. Furthermore, the company always managed to pay a 4 percent dividend to its stockholders.

By the year 1842 a passenger could leave Richmond in the morning and, breakfasting at Taylorsville, arrive at Gordonsville where he could take the stagecoach to arrive at Charlottesville by four in the afternoon. By 1850 he could travel all the way by rail to arrive at one o'clock. Accidents were few, and by 1850, when the line became the Virginia Central, the founders could look back with justifiable pride on a record of solid achievement.

In a few years the Virginia Central would span the Blue Ridge, reaching Covington in 1860. Crozet's tunnel at Afton, completed in 1859, would greatly facilitate this. By 1853 the

General Assembly would be encouraging the construction of the segment from Covington to the Ohio River, although little would be accomplished prior to the War. During the War the line would be instrumental in the movements of Lee's and Jackson's armies. Although the War would wreak havoc upon the line, it would be restored to operation by 1866. In 1867 its name would become the Chesapeake and Ohio, indicating the range it would achieve in the 1870s as it advanced across West Virginia. In the latter part of this decade, the James River and Kanawha Canal would finally be supplanted by a railroad line along its right-of-way. This shortly would become a part of the road, indeed its main line, making the C&O the ultimate successor to, and completing, the James River scheme of Washington and the Board of Public Works. A multitude of other lines throughout West Virginia, Kentucky, Ohio and Indiana would be added over the years, until the system finally reached to Chicago.

In the twentieth century it would become one of America's largest railroad systems. Its name would also be changed from "the C&O" to "the Chessie System." Of the millions who would see the emblem of the sleeping cat, Chessie, on the line's rolling stock, only a few would realise that the portion of track built by the Louisa Railroad Company from Taylorsville in Hanover County to Frederick's Hall in Louisa was the parent of this giant system.

[*Image in original:* Map of the Louisa Railroad in the mid-nineteenth century. *No caption.*]

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"All mine and Otelia's": Billy Mahone's Railroad

Howard H. Newlon, Jr.

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During the last quarter of the nineteenth century and first half of the twentieth, railroads dominated the nation's public transportation of people and goods. In this regard, it is of interest to note that the first expenditure by the Virginia State Highway Commission after its formation in 1907 was $50 for the purchase of two 1,000-mile railroad tickets so that Commissioner Wilson could visit the various areas of the Commonwealth to evaluate the need and potential for highway projects.

At the beginning of the twentieth century, Virginia was covered by a network of railroads, the longest of which were the Chesapeake and Ohio, the Norfolk and Western, and the Southern. These routes had evolved from combinations of shorter, more locally oriented lines that had been constructed during the middle part of the nineteenth century under the guidance of the Board of Public Works.

The July 1980 "Backsights" described the Louisa Railroad, which evolved to the Virginia Central and provided the beginnings of the Chesapeake and Ohio System. The present Norfolk and Western system in Virginia likewise is made up of several earlier local lines, but owes its existence primarily to a visionary but short-lived attempt at consolidation in 1870 by General William (Billy) Mahone, the scope of which is reflected in the name of his railroad: the Atlantic, Mississippi and Ohio Railroad Company. Formed in 1870, the AM&O was placed in receivership in 1876, but it created the foundation of what was later to emerge as the Norfolk & Western, a dominant force in Virginia's public transportation and coal production.

[*Image in original:* Photograph of Mahone. *Caption:* Billy Mahone, taken from Blake's biography of him.]

The story began at City Point, now Hopewell, which is strategically located near the heart of practical navigation by ocean-going vessels coming up the James River. The importance of City Point was recognized early when a settlement was placed there at the junction of the Appomattox and the James in 1613. The settlement survived many hardships, including the massacre in 1622, but remained small, primarily because of transportation difficulties. Despite the establishment of Petersburg at the falls of the Appomattox and Richmond at the falls of the James in the early eighteenth century, by the early 1830s there was a substantial volume of freight traffic from the southern part of Virginia and from central North Carolina that could be loaded on to vessels at City Point for shipment to Baltimore, Philadelphia, and New York. The largest obstacle to the flow was the 10 or 12 miles between Petersburg and City Point that could be reached only by the difficult passages of the Appomattox River or by equally difficult roads through the sandy swamps.

In the autumn of 1833, a petition asking for legislation incorporating a company to build a railroad between Petersburg and City Point was signed by 41 residents, and in 1836 the General Assembly incorporated the "City Point Railroad Company." On September 7, 1838, the first train was operated over the short line.

In the meantime, 120 miles away in Lynchburg, the need for rail connections westward from the James River was receiving attention. In 1830, a petition was forwarded to the General Assembly requesting a railroad between Lynchburg and the New River. This request came at the height of the controversy surrounding the James River Canal, and when the bill was introduced in 1832 it met with vigorous opposition. Instead of approving it, the Assembly voted to authorize construction of a canal from the James River to the Kanawha. Finally, however, in 1839, the General Assembly incorporated "the Virginia and Tennessee Railroad Company" to construct a railroad between Lynchburg and the Tennessee line.

Work began in 1850 and the road was opened for operation over the 204-mile route between Lynchburg and Bristol in October 1856. Recognizing that the only gap remaining to connect the Tidewater with the Mississippi River Valley was the 124 miles between Petersburg and Lynchburg, the General Assembly approved construction of the South Side Railroad in 1849. Shorter than the line between Lynchburg and Bristol and presenting fewer construction problems, the line was put into service in November 1854.

The major engineering feat of the South Side construction was the bridge across the Appomattox River near Farmville. This bridge, with brick piers and timber truss spans, was more than one-half mile long and 125 feet above the river. The engineer in charge, C. O. Sanford, commented: "There have been higher bridges not so long and longer bridges not so high, but taking the height and length together, this is, perhaps, the largest bridge in the world."

While the two companies were extending the line westward, Petersburg's railroad ambitions were growing with emphasis upon creating an 80-mile line to Norfolk and the growing seaport on Hampton Roads. This project was authorized by the legislature in 1851, and financing was obtained two years later. Among the actions taken by the new board of directors was one very important one: the naming of William Mahone to be chief engineer.

Mahone, a graduate of VMI and only 27 years old, had distinguished himself on projects such as the Orange and Alexandria Railroad. Although the route covered only 80 miles, it presented considerable difficulties, including crossing about 10 miles of the Dismal Swamp and building two drawbridges over navigable streams near the Hampton Roads. These were overcome in fine style and the resulting 80-mile line included one 52-mile tangent that may at the time have been the longest section of straight railroad track in the world.

Mahone's ingenuity was evident in the crossing of the Dismal Swamp. Taking a strip 100 feet wide, he had the trees cut and thrown to the center, with the branches being trimmed so that the trees formed a corduroy mat on which the earthwork was placed in the same way that roads were often built. This route continues to carry some of the nation's heaviest rail traffic with minimal maintenance after more than a century of use.

Despite the difficulties of construction and an outbreak of yellow fever, the road was completed, and in 1860 at age 33 Mahone was elected president of the road he had just built. Thus at the beginning of the Civil War there were three independently operating railroads traversing the 408 miles between Norfolk and Bristol.

During the war, Mahone distinguished himself in many battles and rose from lieutenant colonel to major general, the latter rank being attained in a field-promotion by General Lee after Mahone's successful recapture of the Crater at Petersburg.

After the war Mahone returned to his post as president of the Norfolk & Petersburg Railroad. Like many of Virginia's routes, this line had been heavily damaged. The South Side had been even more heavily damaged. Ironically the high bridge over the Appomattox had been partially destroyed during the retreat to Appomattox by Confederate troops under the command of General Mahone. The directors of the South Side, Impressed with Mahone's record of accomplishments in peace and war, elected him president of that railroad also in December 1865. For years, Mahone had dreamed of a united railroad across Virginia toward the Mississippi River through either Tennessee or the Cumberland Gap where valuable coal deposits had been reported. By October 1867, Mahone had convinced the stockholders of the Virginia and Tennessee to elect him president of that third link in the chain.

[*Image in original:* High Bridge. *Caption:* High Bridge over the Appomattox, near Farmville, 1865, from Miller's *Photographic History of the Civil War* (New York, 1911).]

Mahone's proposal for consolidation faced three years of sometimes bitter dispute involving doubts by financiers, political opposition, and intercity and inter-sectional jealousies, but by November 1870, he successfully combined, with legislative blessing, the three roads under the corporate name of the Atlantic, Mississippi and Ohio Railroad. Naturally, there were critics who insisted that the initials AM&O really stood for "All Mine and Otelia's" (Otelia was Mrs. Mahone).

It must be remembered that all of Mahone's efforts at consolidation were accomplished during the five years following the physical and fiscal devastation of the state by the Civil War. Real money was scarce as evidenced by the report of the South Side Railroad for 1865, which stated income for the half-year as $675,000, but added that only $3,592 was good money; the remainder was worthless Confederate currency.

President Mahone was able to persuade local people to work on the track and bridges by giving them something to eat with promises to pay when money became available. For real capital, like many other southern business men, he floated loans, mostly in England.

In September 1873, the banking house of Jay Cooke & Company failed, and there followed a severe financial crisis and depression across the country. Despite Mahone's efforts, the AM&O could not meet its financial obligations and was thrown into receivership by its English creditors. His train master, Henry Fink, whose brother Albert also won fame as a bridge engineer and railroad executive, was named a receiver. Finally, in February 1881, the road was

sold at auction to C. H. Clark and Associates of Philadelphia for about $13.5 million. The property was reorganized as the Norfolk & Western Railroad Company. Mahone was not again connected with railroading but served as U.S. Senator for Virginia from 1879 to 1887.

The N&W added the Shenandoah Valley Railroad, built in 1881 by Frederick J. Kimball, who joined the N&W with a vision of developing the rich coal fields of western Virginia. During a visit in May of 1881, Kimball found an outcrop of bituminous coal 12 feet thick. What he had discovered was the Pocahontas coal seam! The importance of the N&W and the coal deposits of western Virginia to the economy of Virginia is currently much in the news in connection with possible expansion of the company's terminal facilities at Norfolk.

Thus the brief existence of the Atlantic, Mississippi and Ohio Railroad was in 1876 deemed a failure. But Mahone's vision, initiative, and energy had put together an operating property that today forms an important part of America's public transportation system.

The Washington City, Virginia Midland, and Great Southern Railway

Nathaniel Mason Pawlett

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In 1927 Charles A. Beard and his wife, Mary, set forth in their well-known, two-volume work, *The Rise of American Civilization*, their view of the American Civil War. They styled it "the Second American Revolution," a profound transformation of the social and economic order of the United States wherein "the capitalists, laborers, and farmers of the North and West drove from power in the national government the planting aristocracy of the South." Industrial capitalism emerged triumphant from the War to dominate the country throughout the rest of the century and on into the 1920s. Although later considerably modified, their view of American history enjoyed great popularity during the Depression and on into the 1940s.

The history of Virginian and Southern railroads in the years from 1865 to 1900 tends to bear out the Beards' thesis. In 1865 Southern railroads, and particularly Virginia's, were worn-out wrecks, in places almost obliterated. They still had one virtue, however; for all their decrepitude they belonged to Southerners. By 1900 almost all of them would have passed out of Southern control and into the hands of Northern capitalists. Many factors were involved in this. Perhaps the best way to come to some understanding of the forces acting on the Southern railroads is to examine the processes by which the Southern Railway Company came into being in the years after 1865.

If the Southern Railway Company can be said to have a parent it would have to be the Richmond & Danville, chartered in 1847 and completed in 1856 from Richmond to Danville. Wartime necessity caused the construction of the segment from there to Greensboro, North Carolina, to connect with the rails going southward, but until 1864 Danville was the end of the line.

> [*Image in original:* Map of the Richmond & Danville Railroad. *Caption:* Map of the Richmond & Danville system.]

After Appomattox there was, of course, a period of rehabilitation and recovery. The state of Virginia still owned three-fifths of the stock of the company, a souvenir of the pre-war activities of the Board of Public Works in furthering railroad development. This allowed Governor Francis Pierpont to intervene in the company's presidential election in 1865 to prevent former Confederate general Joseph E. Johnston from being elected to that office. In September 1865 Pierpont invited Northern men (and their money) to come to Virginia to assist in the rebuilding of Virginia's railroads. Still, Virginia remained relatively free of the more corrupt practices associated with railroads and carpetbag government in the states to the south. Reconstruction was comparatively mild and brief in Virginia, ending in 1870.

Both the Baltimore & Ohio and the Pennsylvania Railroads had a growing interest in Southern railroads after the War and a contest began for dominance. In Virginia, the state

government, pressed for money during this period, decided to liquidate most of its railroad stock. The 1870 act which allowed Mahone to create the Atlantic, Mississippi and Ohio also allowed him to buy from the state all the state-held stock in the four predecessor companies. An act passed the next month directed the Board of Public Works to sell the state-owned stock in the Richmond and Danville. This stock was soon in the hands of Tom Scott, the head of the Pennsylvania Railroad.

Early in 1871 the Southern Railway Security Company, one of America's earliest holding companies, was formed by a group associated with the Pennsylvania Railroad to secure control of a number of Southern railroads in order to form a through line between the principal northern coastal cities and major cities throughout the South. Some moves toward this had already been made in Georgia and the word was out that the Pennsylvania Railroad had big plans for Southern railroads. Efforts were also under way at Richmond to get control of the Richmond, Fredericksburg & Potomac and the Washington-Richmond route. Below Richmond the group managed to gain a controlling interest in the Richmond and Petersburg and the Richmond and Danville, which was at the time one of the major lines in the upper South. Bribes to James Walker, brother of Virginia's governor, Gilbert Walker, were alleged to have helped in gaining control of the roads. In the 1870s the Richmond and Danville would become the keystone of the Southern Railway Security Company's rail empire. Intense opposition to the activity of this group came from the Baltimore and Ohio and Mahone's Atlantic, Mississippi and Ohio. By this time the B&O had control of the Orange & Alexandria to Lynchburg, considered a key to a through southern route, but the important roads further south had already been secured by the Pennsylvania Railroad group.

With the Richmond and Danville and Richmond and Petersburg in hand, the Pennsylvania group twelve days later gained control of the railroad from Greensboro to Charlotte, North Carolina. By a complicated series of transactions the R&D and the Southern Railway Security Company soon controlled thirteen roads totaling 2,100 miles. These formed a network with three trunk lines serving the South: (1) a route from Washington via Wilmington to Charleston, (2) a Piedmont one from Richmond to Atlanta and Augusta, and (3) a western route from Bristol to Atlanta and Memphis. Unfortunately, the network still seemed to be an idea whose time had not yet come, for it remained unprofitable. Perhaps this was a result of the condition of the region in the post-war years, but the Panic of 1873 further aggravated the situation and the Pennsylvania group finally decided to draw in its horns. By late 1876 most of its holdings were up for sale. The Pennsylvania Railroad did, however, retain control of the Richmond and Danville (the Southern Railway Security Company having relinquished it), until 1880, when it was sold to a Northern-dominated group, the W. P. Clyde Syndicate, several members of which had been in the Southern Railway Security Company. While the Pennsylvania's effort at consolidation had failed, it was clear that consolidation was to be the wave of the future. After 1880, under control of the Clyde Syndicate, the R&D would rapidly expand until by 1885 it would control over 2,600 miles.

Prior to the Panic of 1873 few Southern railroads were in Northern hands, the activities of the Southern Railway Security Company not withstanding, but the decade of the 1870s would see this change under the impetus of bankruptcies, receiverships, foreclosures and the need for capital investment. These allowed the more solvent companies, such as the Richmond and

Danville, to acquire a number of the weaker roads. The Washington City, Virginia Midland and Great Southern Railroad, which would one day become the main line of the Southern, was one of these. Connected with the R&D at Danville in 1874, it had been created in 1872 by the merger of the Orange and Alexandria which ran to Lynchburg, and the Lynchburg and Danville, then under construction. Controlled initially by the B&O the line went into receivership in 1876 and was sold in 1880 at auction. Bought by a group associated with the B&O, it was reorganized as the Virginia Midland Railway in 1881 and shortly sold to a group associated with the R&D. By 1883 the Virginia Midland was under the control of a holding company of the R&D, the Richmond and West Point Terminal Railway and Warehouse Company. Other railroads to the south also passed into the hands of the R&D at this time.

When, in 1880, the Pennsylvania Railroad sold its R&D stock to the Clyde Syndicate, a Northern-dominated group fronted by a number of Virginian gentlemen on its board of directors, this group was not content with its 449 miles of owned and leased roads running southward. Unfortunately, the R&D's charter prohibited the leasing of any railroad not directly connected with the parent line, thus impeding expansion of the system. This was remedied on March 8, 1880, with the incorporation in Virginia of the aforementioned Richmond and West Point Terminal Railway and Warehouse Company, a holding company which could acquire the securities of railroads in any of the Southern states. The Terminal Company neatly avoided the leasing limitation on the R&D's charter. Not surprisingly, the R&D always held the majority of the stock of the Terminal Company and its directors were also directors of the R&D. Again, not surprisingly, W. P. Clyde of New York City was the president of the Richmond and West Point Terminal Railway and Warehouse Company.

With the holding company in place, expansion immediately got under way. By the middle of 1882, the R&D had 827 miles in its system and the holding company controlled 1,248 miles more. By 1883 a 2,200 mile system reached from Tidewater Virginia to central Alabama and served most of the major cities of Virginia, the Carolinas and Georgia, including the capitals. By 1885 the system consisted of 2,669 miles, of which 853 miles were owned or leased by the R&D and 1,816 miles by the Terminal Company.

In 1885, also, the necessity for operating via the holding company disappeared with a change in the R&D's charter giving it an unlimited right to hold the stock of other railroads. With the Richmond and West Point Terminal and Warehouse Company now superfluous, the R&D group quickly stripped it of the cream of its railroad securities with the idea of then divesting themselves of the holding company as soon as possible. Other holders of stock screamed but the R&D's directors made no effort to placate them. However, several wealthy New Yorkers then became interested in the holding company. Gaining control of it, they quietly began to buy up the stock of the R&D itself. By November 20, 1886, the holding company controlled the R&D instead of the R&D controlling the holding company. At the annual meeting the next month new names appeared on the boards of directors. Ten newly appointed men, eight of them from New York, were listed among the directors of the Richmond and West Point Terminal and Warehouse Company which now controlled the subordinate Richmond and Danville Railroad.

Under new management, the system trebled again in size between 1886 and 1890. In 1890 with some 8,000 miles, it was one of the longest roads in the nation. Expansion begat expansion, until financial difficulties began to intervene. In 1892 the system went into receivership and J. P. Morgan was requested to examine the holding company to see what could be done with it. After protracted negotiations over the stiff terms he demanded, Morgan agreed to take over the job of rehabilitating the company and untangling its complex corporate structure. By 1893 Northern banks and bankers had control of the Richmond and West Point Terminal and Warehouse Company, the Richmond and Danville Railroad and the vast associated system. The new Southern Railway Company would become the property of the "House of Morgan."

[*Image in original:* Photograph of J. P. Morgan. *Caption:* J. P. Morgan.]

As Samuel Untermyer and the staff of the Money Trust investigation put it in 1913:

> Thus, on the reorganization of the Southern Railway Co. by J. P. Morgan & Co., in 1894, a majority of its stock was placed in a voting trust which deprived the stockholders of all representation and voting powers and vested the absolute control of the company in the trustees, J. P. Morgan, George F. Baker and Charles Lanier . . .

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Moncure Robinson, Civil Engineer

Nathaniel Mason Pawlett

["Backsights" No. 67: originally published in the *Bulletin*, October 1980]

One of the most neglected figures in the history of transportation in Virginia is Moncure Robinson. The popular conception of Virginian history has been compared to a blackened stage containing an illuminated tableau of the figures of John Smith, Pocahontas, William Byrd, Patrick Henry, George Washington, Thomas Jefferson, John Randolph of Roanoke, and General Lee. An oversimplification, perhaps, but it serves to emphasise the idea somehow prevalent that little really happened in Virginia after the Revolution until 1861, and nothing since. Various writers have made the point that Virginia's production of major historical figures rapidly decreased after 1776 to zero in this century, thus explaining the faltering influence of the Old Dominion on the nation's life and politics.

[*Image in original:* Portrait of Moncure Robinson. *No caption.*]

A countervailing interpretation appeared when it was asserted that the conditions of the time and opportunities available to him determined what a man became in each century. According to this interpretation, Virginians of as great abilities lived during the nineteenth and twentieth centuries as during the seventeenth and eighteenth, but the opportunities available to them were simply different. Thus, the areas of their fame were different, even though they may have had abilities comparable to those of men in earlier times. Still other historians have produced long lists of Virginians who became famous in other states as political leaders from the local level up to the national. Similar lists could probably be compiled for other fields and thus provide a host of topics for theses and doctoral dissertations in the coming years.

Any such list for engineers would have to include toward the top the name of Moncure Robinson. Robinson is an illustrious name in seventeenth and eighteenth century Virginia annals as well as those of the mother country. Indeed, *Burke's Peerage* devotes considerable space to the various Robinson baronetcies, one of which belongs to a Loyalist branch which removed from Virginia to Canada at the time of the Revolution. Moncure Robinson, along with his brothers, Conway and Edwin, would certainly seem to indicate that no diminution of these abilities had occurred in the Robinson family by the beginning of the nineteenth century. Born in 1802 to a Richmond merchant family, Moncure was tutored for several years by a private tutor and entered the College of William and Mary at the age of thirteen. He spent three years there, leaving in 1818 without a degree, not an unusual practice at that time. At some point during his college career he seems to have determined upon a career in surveying and, perhaps, to become a civil engineer. It should be noted that engineering schools, whether civil or military, were yet a rarity in the United States. West Point had been established in 1802, in Virginia William and Mary would dally briefly with engineering in the early nineteenth century, and the Virginia Military Institute would come into existence in 1839, but Robinson probably saw the necessity of training himself in his chosen profession.

The James River and Kanawha improvement scheme seemed the logical place to gain experience, so in 1819 he attached himself as a volunteer assistant, without pay, to a state expedition looking into the feasibility of a canal between the headwaters of the two rivers. Seven months' service among the mountains earned him honourable mention in the expedition's report to the Board of Public Works. In 1822 he traveled to New York to look at the Erie Canal, then being constructed. No doubt with the hope of later employment in the James River improvements, he examined the length of the canal, made drawings of the works, and was generally well received by the canal engineers. Less than a year after his return he was hired as engineer for a section of the James River Canal. Two years at this must have broadened him considerably, while simultaneously increasing his reputation by the noticeable quality of his work.

When it began to look as though Virginia's effort would falter, he decided to visit Europe. Perhaps conceived as his own version of "the Grand Tour," his letters reveal, however, a strong desire to increase his level of professional knowledge. Certainly it was to be an important decision for him and for the future of American technology. Besides being one of the first American civil engineers to acquire European skills, he arrived at just the right moment to view the birth of railroads in England. Crossing the Atlantic in the spring of 1825, Robinson remained in Europe for two and a half years. Living at Paris for most of this period, he studied at the Sorbonne for the two winter sessions 1825-26 and 1826-27 subjects which his letters indicate were related to his profession. France was then the leader in technical education in the world, and Robinson seems to have been extremely fortunate in being able to spend two years in Paris at this particular time.

Neither did he neglect the practical side during his European sojourn. He was, he said, interested both in "the practise at England and the theory of this country (France)." Although his original objective was canals he also visited factories and examined machines, looked at bridges, aqueducts, and other objects of engineering interest. His particular interest was canals and he tried to examine them wherever he went, but the ingenious English railroads early made a strong impression upon him. His fascination with the English talent in the mechanic arts, if not with the English themselves, is made apparent in a letter of July 22, 1825:

> In practical mechanics the French must be at least one hundred years behind the English. It is indeed astonishing that in a country so contiguous to one where all the mechanical arts are brought to the highest perfection, their contrivances in everything should still be so rude. Here I can travel in no direction, but I come across some fine specimen of art executed In this land of dull & plodding people. It is I suppose with nations as with individuals. The Population which is most gay & sprightly is not always that which will be found to think most deeply & most usefully.

Almost intuitively he sensed the superiority of railroads to canals, a realisation which would be somewhat slower in coming to most of his fellow Virginians. In a letter published in the Richmond Enquirer later in 1825 he proposed that Virginia connect the James River and the Kanawha Rivers by a 130 mile long railroad, suggesting that inclined planes could be used wherever the grades proved too steep. Just before his return in 1827, he again spent several months examining railroads. Certainly he must have been familiar with the 1825 Stockton and Darlington, first of the modern railroads with its steam locomotives and steam-powered inclined planes.

Upon his return he found that news of the English railroads had preceded him and that the idea had taken root in a number of places, but not in Virginia. In the spring of 1828 he was employed by the Pennsylvanian Canal Commissioners, who recognized his knowledge of railroads and wished him to survey several railroad routes for them. This was the period when the Erie Canal was on all tongues and the canal seemed the wave of the future to most Americans, yet Robinson was turning rapidly away from canals and abandoning his previous experience with them. Railroads were in their infancy here with only a few yet under construction when Robinson accepted this task.

Whatever his belief in French technology, Robinson's report illustrated his belief in the engineering principles of the English. American construction had never had the permanence of English and Continental models and Robinson noted that this could be extended to railroads with the substitution of wood for stone ties, and wood rails plated with iron for the cast-iron rails used abroad. Wooden bridges and trestles could obviously be substituted for the most permanent brick and stone. But he thought no deviation would be possible with respect to grades. The cardinal rule here stated that the road must be planned with respect to the direction of trade: if trade were to be in both directions, the road would have to be as nearly level as possible; if in only one direction, the return direction must be slight enough to allow the motive power used (horses, locomotive or cable) to return the cars upward. He indicated that this should not exceed 18 feet per mile (0.33% or 0.60) if the results of experiments performed by the Stockton and Darlington Railroad were to be accepted.

Up to that time railroads had enjoyed little advantage over turnpikes and canals because all three were horse drawn. But now with the advent of the steam locomotive, all that was changed, for the speed of travel was vastly multiplied. Inclined planes and stationary engines could also now allow railroads to negotiate grades previously considered impossible. Robinson's report laid down four principles for railroad routes: (1) they should cross mountains at their lowest points; (2) the direction of most trade should have as slight a grade as possible; (3) routes should be chosen suitable for locomotive use; and (4) where intolerable grades had to be accepted, they should be handled by inclined planes. To some extent these rules resulted from the nature of the project in question, using a railroad in place of a 4½-mile tunnel through the Allegheny Mountains to complete a canal across the state of Pennsylvania. As with Virginia's James River system, a debate then developed as the railroad appeared and made the canal technologically obsolescent. Ultimately, the Allegheny Portage Railroad was built almost as Robinson recommended, consisting of a steam railroad on the levels, water and steam power on inclined planes, and a one-mile tunnel near the summit. Unfortunately, the Pennsylvania legislature initially rejected Robinson's recommendations and called for another report.

Already unhappy with Virginia's position on internal improvements, Robinson now became unhappy with Pennsylvania's. From this time forward he would become more and more involved with private railroad projects and have little to do with state projects. Often he would be simultaneously involved with several projects. Only twenty-seven in 1829, he would by 1840 have been involved in one capacity or another with over one-third of the railroad mileage in the country. He performed at least fifteen railroad route surveys. These, when submitted, were usually accompanied by promotional statements as to traffic and profitability. These statements helped to draw capital to the projects and many of these railroads then employed Robinson as

their chief engineer during construction. In fact he did the original surveys for all but one of the seven railroads for which he was chief engineer during construction. He was also simultaneously the chief engineer of two or more railroads during all of this time. By 1840, then, his heavy responsibilities induced him to do less and less surveying. After 1840 also, his reputation and his experience began to push him towards administration. In that year he was elected president of the Richmond, Fredericksburg and Potomac Railroad**.**

To detail all of Robinson's railroad involvements is beyond the scope of this article but a brief sketch of a few seems worthwhile. The first two railroads he built, in 1830 and 1831, were both horse-drawn, coal feeder railroads. These were the Chesterfield in Virginia and the Little Schuylkill in Schuylkill County, Pennsylvania. Robinson achieved only a partial implementation of his English principles on these. Both had continuous downgrades from coal mines to water transportation (the direction of trade) and the Little Schuylkill was built so that it could use locomotives, two of which were imported from England in 1833.

The first railroad on which he was able to fully implement his English principles was the Petersburg Railroad (1831-33), a 60-mile line from there to Weldon, North Carolina. Laid out with slight grades and an inclined plane to water level on the Roanoke River at Weldon, it had English locomotives from the beginning. While he was engineer on this he was also the engineer on the Danville and Pottsville Railroad in Pennsylvania. This road ran through the Appalachian ridges and had seven inclined planes, a tunnel, and many cuts and fills to keep the grades low. Interestingly, these inclined planes used later to fill specially designed tank cars that were used as counterbalances to the loaded coal cars, thus eliminating the need for stationary steam engines at all of them except one.

Robinson's last three railroads represented his maturing as a railroad engineer and the transition from the early mixed-mode systems designed to serve mines to the modem unitary railroad. For the Philadelphia and Reading he enunciated three principles based on those of his 1828 report: (1) no ascending grades in the direction of trade; (2) no grade to exceed 18 feet per mile; and (3) no curve should have a radius of curvature less than 818 feet. Although the narrow valley of the Schuylkill already contained turnpikes and a canal, this route was double-tracked throughout. Calculated to handle 75,000 tons of anthracite per day, it also contained several bridges and tunnels. One of Robinson's assistants, Richard Boyse Osborne, who later became his biographer, called this line "the crowning achievement" of his career.

The Richmond, Fredericksburg and Potomac should receive coequal billing with the foregoing. Surveyed in 1834 by Robinson, the line was completed from Richmond to Fredericksburg along a 50-mile route suitable for locomotives by early 1837. This line crossed the rolling watersheds of several rivers and was something of an achievement on this account alone. Subsequently, the RF&P would become a major part of the north-south rail network.

Another important part of this network was the rather short Richmond and Petersburg. By 1838, two years after his appointment as its chief engineer, this line was in operation. Robinson's bridge across the James River on this line was regarded as a major engineering achievement. But with each new triumph, his accumulating expertise, his experience, and the number of railroads with which he maintained official or unofficial ties forced him more and

more in the direction of administration until he was spending most of his time in an office and using assistants for his field work. His investments in Virginia railroads were also growing, culminating in his election in 1840 to the presidency of the RF&P.

Active in railroad affairs up to his death in 1891, Robinson engaged in many other activities during a career of over fifty years. He designed a locomotive, and had it built, also a drydock, had a interest in the Chesapeake and Delaware Canal, established the steamboat line between Baltimore and Norfolk, and was active in many other areas. It might even be said that he operated a school for civil engineers, in view of the number of his associates and subordinates who went on to fame. It has been said that being exposed to his system and discipline constituted "an education of the very best description for civil engineers."

Certainly, Moncure Robinson was a formative influence upon America's early railroad system and the people who built and ran it. This influence did not end with 1861, but continued on into the postwar years, ending only with his death. A comprehensive book on Robinson and his achievements has yet to be written. This, besides disclosing his involvement in a number of other fields, would probably provide us with the names of a number of other Virginians of similar outstanding ability who yet remain virtually unknown due to their having been born at the "wrong" moment in history, at a time when few "heroic" roles were available to them.

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Changing the Gauge: Railroads as Regulators, Part I

Howard H. Newlon, Jr.

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Much has been written in recent years concerning the effects of various regulations upon America's railroads. The situation in the nineteenth century was quite different, since the railroads directly and indirectly regulated and shaped in important ways the lifestyles of the people.

Henry David Thoreau, the noted naturalist, would seem an unlikely source for commentary on this standardizing influence of the railroads on nineteenth century American life, but Thoreau's hermitage cabin by Walden Pond was only 500 yards from the railroad between Boston and Fitchburg. His observations caused him to write that "the startings and stoppings of the cars are now the epochs of the village day. They come and go with such regularity and precision, and their whistles can be heard so far, that the farmers set their clocks by them, and thus one well-conducted institution regulates a whole country. Have not men improved in punctuality since the railroad was invented?"

While the railroads did assume a dominant role in nineteenth century America, providing "checks on time" and in many ways "regulating a whole country," such regulation and standardization was not a feature of the facilities themselves, which as described in previous "Backsights" articles, developed originally as short lines with little if any thought of their compatibility with the connecting lines built by other private entrepreneurs who used different suppliers for track, rolling stock, etc.

The central feature of Virginia's nineteenth century transportation policy, like that of the rest of the nation, was the establishment of connections between the eastern and western parts of the Commonwealth. But the major energies of railroad companies were directed toward the race to complete local lines as quickly as possible. Virginia had been slow to embrace the railroad because of its preoccupation with the James River and Kanawha Canal, but the railroad companies had been very productive and by the end of 1880 the state contained almost 1,900 miles of track, ranking second behind Georgia among the ten Southern states, which, combined, contained about 15,000 miles.

[*Image in original:* Railroads in Virginia, 1861 (heading on map). *No caption.*]

The essentially local nature of the railroads not only in Virginia but throughout the great portion of the nation, had resulted in a multiplicity of track gauges (widths). By the eighties there were throughout the South about fourteen broad gauges as well as seven narrow gauges. The broad gauges ranged between a maximum of 6 feet and a minimum of 4 feet 1 inch. A great controversy over the relative merits of the broad gauge and the narrow gauges of about 3 feet had continued for some years but had pretty well been settled in favor of the broad gauges, with the narrow gauges being relegated to very mountainous areas.

By 1880 the great majority of the lines north of the Ohio River and west of the Mississippi were of the English standard gauge of 4 feet 8½ inches, while well over 80 percent of the southern mileage was still the 5-foot gauge. For practical purposes gauges between 4 feet 8 inches and 4 feet 9 3/8 inches could be considered the same, since rolling stock could be interchanged with little difficulty. The obvious defect of the regional gauge was that from the standpoint of rail transportation, the South was isolated from the markets in the rapidly developing western states and the sites of major industrial production in the northeast.

Within Virginia, the east-west lines south of the James River had a gauge of 5 feet, whereas the north-south lines and those east-west lines above the James employed a 4 foot 8½-inch gauge.

The impact of the different gauges within the state is obvious. Just as the South was isolated from the remainder of the nation, goods could not be shipped across Virginia without being unloaded and reloaded at least once. Passengers likewise had to change cars at various connecting points. An alternative to reloading cars was to transfer the cars from trucks (wheels) of one gauge to trucks of the other. Either approach resulted in delays and expense, and these junctions became significant bottlenecks.

As aggravating and inconvenient as these delays were in peacetime, the problems had been greatly magnified during the Civil War. There was but one connection for each of the differing gauges between Virginia and the other Confederate states. If, for instance, the enemy should seize or break the Petersburg Railroad below that city, it would be impossible to evacuate the rolling stock of roads above the James. Similarly, the 5-foot gauge equipment would be trapped inside the state once the Federals gained control of Knoxville and the railroad connecting with the Virginia and Tennessee at Bristol.

While it is difficult to conceive that these bottlenecks could have been allowed to develop and continue, the situation reflects the suspicions and reluctance of the various companies to entrust their rolling stock to one another. Finally, however, what one observer described as "obedience to the natural law of trade" led the managers of the southern railroads to enter into an agreement early in 1886 to convert all of the gauges to a common standard of 4 feet 9 inches. The most amazing aspect of this agreement was that the entire 14,000 miles were converted throughout the South in a single day, June 1, 1886. Within Virginia the major burden fell upon two lines, the Richmond and Danville and the Norfolk and Western, which had the greatest mileage of the 5-foot gauge.

A brief news item in the *Norfolk Virginian* for Tuesday, June 1, 1886, sets the effort in deceptively simple terms.

> The work of changing the gauge of the Norfolk and Western Railroad will begin this morning at 4 o'clock. Breakfast will be served to the hands all along the line at 3 a.m. promptly. The expectation is, should no accident occur to delay operations, to have the entire work completed by 4 o'clock in the afternoon. On the Eastern Division the road will be divided into sections of ten miles and twenty nine men will be employed on each section. No trains will be run today, but all trains will resume their regular schedule tomorrow.

Another entry, in the June 2 edition, reported.

> The work commenced yesterday morning at 3:15 o'clock and early in the afternoon the entire line between the city and Lynchburg had been changed. The work was under the personal supervision of Captain N. M. Osborne, Superintendent of the Eastern Division, and an inspection train arrived from Petersburg last evening. The change of gauge was the greatest piece of railroad work ever attempted in the United States.
>
> There was lively competition as to which section would be first completed. Appomattox was the first to report at 8:30 a.m. The entire work consumed only eight hours. This was several hours earlier than was expected.

In his book, *Lynchburg and Its People*, W. Asbury Christian describes in one sentence the efforts, including those west of Lynchburg, as follows: "June 1 all traffic on the Norfolk and Western road was stopped and the gauge of the entire road from Bristol to Norfolk was changed by one thousand men in eight hours."

In his thesis, *Development of the Norfolk and Western Railroad*, written in 1925, Herman P. Thomas, using interviews with retired employees as his source, sheds further light upon how this remarkable feat was accomplished. He states "all the material had been gotten in place and the farmers along the road who had been asked to help were ready and everything had been done to facilitate the work, even to loosening the spikes which held the rails."

The cost of the gauge change was estimated by one authority at about $150 per mile, or about $2.25 million for the ten southern states. Perhaps the most striking feature of this entire enterprise is the rather matter-of-fact way in which the contemporary accounts describe the "greatest piece of railroad work ever attempted in the United States." Clearly June 1, 1886, was a landmark day in the history of transportation in Virginia and the South.

The June 3 edition of the *Norfolk Virginian* announced that the freight rates on the Norfolk and Western were being reduced, undoubtedly reflecting the savings resulting from the shift to a common gauge.

Commenting on the shift, the *Commercial and Financial Chronicle* concluded "The roads are yielding simply to the demands of necessity but there is no force or compulsion—no law except the natural law of trade, in obedience to which they make the change. They are exercising their own volition entirely. Nevertheless the agreement between them is unanimous. Is there not in that a lesson to those who never weary in calling for legal enactments and Government intervention to accomplish this or that? . . ."

The writer then compared the changing of the gauge with the adoption of uniform time that had been accomplished three years earlier. The latter will be the subject of the next "Backsights."

Standardizing Time: Railroads as Regulators, Part II

Howard H. Newlon, Jr.

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During the nineteenth century it was largely true, as Henry David Thoreau has written, that "one well conducted institution regulates a whole country. Have not men improved in punctuality since the railroad was invented?" He further observed that farmers were able to set their clocks by the whistles of the trains that "come and go with such regularity."

But despite observations such as those of Thoreau, there remained a significant question as to what time it really was. As late as the beginning of the 1880s each locality still operated on what was accepted as "local sun time." The sun had of course been used for centuries to regulate and coordinate man's activities. Sundials are mentioned in the Old Testament.

The basis of local sun time was that it was noon when the sun crossed the meridian at that specific location. When a locality was large enough to have a town clock, it became the official time from which other clocks were set. This meant that there would be a four minute difference for each degree of longitude; for example, when it was noon in Richmond, it would be about 11:50 at Roanoke, etc. Theoretically, the time differed at successive locations in an east-west direction around the world. As chaotic as this may seem today, it really made comparatively little difference until modern means of communication such as the telegraph and telephone were invented and developed. But with the extension and consolidation of the railroads, the matter of establishing and meeting clearly understood schedules took on added importance. It also became increasingly complex.

Each railroad line was forced to adopt a standard of time for its operation. Usually the time for the entire length of the line was that of one of the important cities through which the route went. In Europe, all the railroads in a country adopted the time of the capital city. Thus, in France, trains operated on Paris time, while English trains used London (or Greenwich) time. This worked reasonably well, since these countries were comparatively small, but the vast expanse between the Atlantic and Pacific Oceans presented a different order of problems for the United States. As one observer wrote: "Each road consulted its own convenience, irrespective of the effect of such action upon other roads, and the result has been that quite frequently several different kinds of time have been in use at one and the same point." This made a watch virtually useless, since the solution for traveling by train was not as simple as merely adjusting a watch. Local time did not necessarily coincide with railroad time at a given location. For example, if, after reaching Cleveland, one then determined to set out for some point on the Cleveland, Columbus, Cincinnati and Indianapolis road, Cleveland time would prove a somewhat misleading guide, for the official time of the road was actually Columbus time, which differed from that in Cleveland by about five minutes. By 1880 at least fifty of these different standards of time were in use by America's railroads, and confusion reigned.

The need to establish uniform and consistent worldwide time standards was recognized by the American Meteorological Society in 1879, when a committee was appointed to study the question. As a result of this effort, the U.S. Congress, in 1882, authorized the President of the United States to convene an international conference to meet in Washington on October 1, 1884. The AMS committee was aware of a suggestion that had been made to divide the circumference of the globe into 24 zones, each with its own time.

But with the chaos that had developed, the railroad industry could not wait for governmental action so, in October 1883, a "time convention" was held by them at which it was announced that railroads aggregating over 79,041 miles of track had agreed to adopt a system of four time zones for the U.S. Only a few lines (1,744 miles) opposed the action, and, subsequently, the vast majority of these agreed to the change. According to one observer "the whole affair was carefully managed by W. F. Allen, the editor of the *Traveler's Official Guide*, who had charge of it and deserves great credit for the work done. . . ." Obviously, the preparation of standard times greatly simplified not only travel but the preparation of Allen's guide.

The system that was adopted established four time meridians for the U.S.; namely, those corresponding to 75, 90, 105, and 120 degrees longitude, respectively.

There was initially some confusion about the plan and it was variously stated that "eastern time" extended 15 degrees west to the 90th meridian line; or again, that it extended 15 degrees east to the 60th. Finally, it was clarified that the limits extend 7½ degrees east and west with the meridian at the center of the zone. The zones were not rigorously applied and minor deviations were permitted in order to put major cities at the terminus of a particular railroad in the most convenient zone. Such deviations may still be seen on a modern map.

As would be expected, objections were raised. These related primarily to the disorder that would be produced by having noontime occur on the clock when the sun was not directly overhead. This was countered by pointing out that under the existing system the sun reached the meridian scarcely half a dozen times a year anyway, and that the civil or ordinary day was simply the average of all of the solar days. The existing ordinary day might in fact vary by 15 or 16 minutes from the solar day at certain times of the year.

The benefits were apparent, not only to the travelers but also to the nation's commerce. Commenting on the benefits of the system, the editor of the *Commercial and Financial Chronicle*, in the November 17, 1883, issue, wrote that "the merchant in San Francisco will know that as the clock in his office strikes 12 the clocks in our New York banks are striking three, and that business has closed." He observed that agents doing business with a company in an adjacent time zone would know that business commences just one hour earlier or later—"not a moment more or less."

The editor further observed that "in the matter, too, of transmitting telegrams, it will be easy to compute the exact time a telegraph company has consumed in sending a message, and to determine if there has been any unnecessary delay."

The railroads adopted the new system on November 18, 1883. The international convention met on October 1, 1884, but was unable to agree on the location of the zero meridian. Because the railroads were more and more coming to dominate the commercial and social life of the country, the four time zones gradually came to be the accepted system for timekeeping.

But it was not until World War I that official action was finally taken by the U.S. government. Growing out of the necessity to enact wartime conservation measures, the Standard Time Act of 1918 was passed, requiring daylight saving time for seven months a year. This act required the designation of a standard time from which to measure daylight saving time. The standard time adopted by the railroads in 1883 was chosen for this. Authority for dealing with the time zones was vested in the Interstate Commerce Commission in 1918 where it stayed until the creation of the Department of Transportation and the passage of the Uniform Time Act of 1966. The time zones are presently under the jurisdiction of the Department of Transportation. Where the railroads once regulated the time, the activity has in due course been transferred to that government agency which now regulates the railroads. The question of time has thus come almost full circle, to where it began a hundred years ago.

Changes have been made periodically however. For instance, until 1947 the western part of our Department's Bristol District was still on central time. But the basic elements of the standard times in the U.S. are the product of the transportation and industrial revolution and the accompanying standardization which occurred during the latter part of the nineteenth century throughout America.

As Thoreau put it: "Thus one well-conducted institution regulates a whole country."

Richmond's—and America's—First Electric Railway System

Howard H. Newlon, Jr.

["Backsights" No. 70: originally published in the *Bulletin*, January 1981]

The last two decades of the nineteenth century represent perhaps the most important 20 years of America's history, because it was within this brief period of time that most of the essential components by which modern society functions were established. It was during this period that enterprising people were able to exploit the inventions and technical innovations that flooded from men like Bell and Edison. It was the time of entrepreneurs like Rockefeller, Vanderbilt and Gould. It was the time when the nation, and particularly the South so recently ravaged by the Civil War, embarked upon an unparalleled expansion of its industrial capacity.

Consider, for example, the patents for the telephone—1876, electric light—1880, linotype—1886, and motion pictures—1889, which brought about a revolution in rapid communication and made our modern lifestyle possible. As described in previous "Backsights," expansion and innovations in transportation were vital elements in the changing industrial and social patterns. Time was standardized in 1883 and the track gauges were standardized in 1886. The railroad consolidations of the 1880s permitted the convenient long-distance shipment of goods and transport of people. Within Virginia, Jed Hotchkiss's publication, *The Virginias*, extolled the mineral resources of the two Virginias, emphasizing the numerous iron and other mineral deposits of these states. This period saw the real blossoming of America's Industrial Revolution.

Rapid and convenient transportation and communication greatly changed the patterns of urban growth. By the second decade of the twentieth century the majority of Americans would live in urban areas. For more than two centuries America had been a nation of farmers, artisans, and shopkeepers who lived in or within walking distance of the work place. The core of Virginia's towns and cities had changed little since they were established. Now, the money generated by this industrial growth was spurring a gigantic land boom and the prospect of "instant cities." Land and development companies sprang up all over the Commonwealth. One authority has reported that over $3 million worth of building lots were sold in western Virginia over a period of three weeks.

The financial crisis of 1893 effectively ended the land boom, but the period created Virginia's first "suburbs"; the initial rings of residences somewhat separated from the work in the center city. These survive in most Virginia towns and cities in the form of the large Victorian mansions that currently are undergoing a renaissance as modern suburban dwellers attempt to return closer to the work place.

The creation of these Victorian suburbs "far from the center of town" required new means of transportation for commuting to work and social engagements. These means of transportation have greatly magnified and continue to demand innovation and attention.

Large cities, such as New York, faced the problems of traffic congestion during the early part of the nineteenth century. In 1827, Abraham Brown began operating a 12-passenger, horse drawn carriage on Broadway. This was followed soon after by a horse-drawn street railway in 1832. Except for New Orleans, no other cities developed street railways at this time but, by 1860, large cities, including Richmond, had horse drawn street railways.

During the 1870s New York began development of a steam-powered, elevated train. Other cities, including Chicago, soon followed suit. By 1890 these steam-powered elevated railways were generally considered inadequate. But before that time, in 1880, an exciting new factor, electricity, had appeared on the frontier of scientific progress. Several forward-looking men began to dream of electric power for public transit.

In 1884, Cleveland tried a short streetcar line with a car-mounted motor driven by electricity from a third rail in an underground conduit. Two years later in Montgomery, Alabama, an inventor ran, for a short distance, streetcars that obtained their electric power from above. These had a single nonreversible motor on the front platform connected by a metal chain to the axle of the front wheels. Overhead, an electric wire rode a tandem-wheeled carriage, technically called a *troller*. Mispronunciation of the word brought into our language the term trolley car.

The man who was to revolutionize street railways, Frank Julian Sprague, a native of New England, was in 1878 graduated from the U.S. Naval Academy, where he had shown a keen interest in naval architecture and physics. Prophetically, his first assignment was aboard the U.S.S. Richmond. During this duty his urge for invention increased and he filled his notebook with detailed drawings and descriptions of a variety of gadgets, including an electric motor. For the next several years he held a series of assignments that permitted him to experiment with various electrical shipboard call systems, dynamos, etc. Early in 1882 he received a coveted detail from the navy to go to the Crystal Palace Exhibition in London. He was so taken with this exhibition by the world's eminent scientists that he overstayed his orders by six months. His voluminous report was considered so important that it perhaps saved the young ensign from a court-martial.

In 1883 he resigned from the navy and spent most of the next year with Thomas Edison at Menlo Park, but his interest in motors led him to form his own company in 1884. While in England, Sprague had indulged in a wild dream of electrifying the Metropolitan District Railway, using the tracks for conductors and a center-line overhead network, the forerunner of the modern trolley.

Although his company was in New York, and his dream had begun in London, his opportunity came in a somewhat less likely city, Richmond, Virginia. In 1886 several New York City capitalists visited Richmond looking for a factory site. Instead, they recognized in the capital a site for a new public utility, a transportation system that would compete with the Richmond City Railway Company, which employed 190 horses and mules to pull its cars over about 4½ miles of track. The difficult task of securing a franchise for the second street railway was accomplished between December 1886 and March 1887. During this period, several other companies attempted to gain the franchise. The new corporation, called the Richmond Union

Passenger Railway Company, was approved on March 23, 1887. The approval designated the streets to be used, and included one significantly vague clause: "the said company may operate its cars by the use of horses and mules, or such other motive power as may hereafter be allowed by the Council." In June 1887, the Council approved electricity as the motive power. A contract was let to the Sprague Electric & Motor Company of New York City for the manufacture and installation of the electrical mechanisms and facilities.

Sprague's was a shoestring operation, and he had failed in his two-year-old effort to demonstrate that an experimental electric car could be operated for a short distance in New York. A fuse in one of his motors had blown with an explosive flash while financier Jay Gould was aboard. Gould, scared out of his wits, tried to jump from the moving car and ever after refused to show any interest in electric street cars, thus depriving New York City of its opportunity to be the first city to have such a facility and indirectly transferring this mantle to Richmond.

Sprague later characterized the Richmond contract as one "which a prudent businessman would not ordinarily assume." He agreed to supply an electric generating plant of 375 horsepower; a complete overhead current supply system for 12 miles of track; and 40 streetcars, each with two motors and proper accessories. This represented about as many motors as were then in use on all the cars in the world. The contract further required that at least 30 of the cars operate simultaneously. A cash payment of $110,000 was to be made when the system had operated "satisfactorily" for sixty days.

After a bout with typhoid fever, Sprague visited the construction in progress in Richmond and was disappointed with the construction of "something that passed for a track." He found many sharp curves, one with a grade of 8½ percent. In some places the grades reached 10 percent.

Of greatest concern was the 150-foot climb from the Shockoe Valley to the top of Church Hill, and a rise of almost 160 feet to reach Broad Street, quite a challenge for two 7½ horsepower motors.

Late one night Sprague and a handpicked crew left the car shed at 29th and P Streets on Church Hill for the maiden trip to the west. Things went well at first, but as the 10 percent grade was approached, Sprague began to doubt. But the hill was conquered and Sprague found himself surrounded by an admiring throng of patrons leaving the theater. Despite their adulation, Sprague knew he had failed because the motors had been overstrained.

As the admirers gradually left, Sprague announced to his associates that there was some trouble in the circuits that would require the instruments to be brought from the shed. Sprague laid down on the seat to rest, which caused the crowd to lose interest. Thus no one saw the "instruments," four stout mules, when they arrived to drag the car back to the shed.

Sprague persevered through many major and minor problems, including developing, though more than 40 designs, a sure input of electrical current from the overhead wire. Something had to be done about ice that formed on the overhead wires. One particularly severe day saw his mechanic standing atop the lead car swatting the icicles with a large broom. Test

runs were made as early as November 1887, but neither Sprague nor the company were satisfied. Sprague persisted, working literally day and night. Many of the early test runs became public, permitting the people "to ride free of cost, and much to their delight." Finally, on January 9, 1888, six cars were kept running for as much as four hours on a regular schedule. Sprague had agreed to accept a reduced payment, but finally his insistence upon proving the performance of each item of equipment, and his persistence in proving that a large-scale electric transit system was practical, paid off. Before Sprague left Richmond in late 1888, the system was completely double-tracked for more than seven miles, from Church Hill to the corner of West Clay and Hancock Streets.

[*Image in original:* Photograph of an electric street car. *Caption:* The Nation's first electric street car system was developed in Richmond in 1888.]

But beyond providing Richmond with the nation's first electric street car system, Sprague's success attracted the attention of officials of the West End Street Railway Company of Boston, who were touring the country to determine how best to modernize the city's extensive track system then requiring 8,000 hungry horses and the resulting pollution of the streets. The touring officials had been impressed with San Francisco's cable car system and had just about decided to adopt it. The visitors were favorably impressed with Sprague's Richmond System, but wondered what would happen if many cars became bunched on a short span of track. Could the single wire carry the load?

Sprague really didn't know, but one night he lined up all of the available cars at one point near the shed on Church Hill, far from the central power station at the southwest corner of East Clay and South Seventh Street. Going to the power station, he instructed the engineer to raise the steam pressure, fasten down the safety valves, and keep the generators operating no matter what happened. When he returned to the site where the cars were waiting, he was told by one of the Boston visitors that "if you can start all those cars at once, I'll be convinced." Sprague assured him that they would start, although, in truth, he wasn't sure. The cars started slowly, their lights dimmed, but in a short time they were trundling out of sight. That demonstration settled the nature of Boston's interurban transportation for years to come.

Sprague's Richmond adventure cost his company about a $75,000 loss but his ultimate compensation lay "in the subsequent unparalleled growth of a great industry." The electric streetcar system rapidly replaced the horse drawn vehicles nationwide. The last streetcars in Richmond operated until late 1949, when they were replaced by buses of the Virginia Transit Company.

The last car, No. 408, was burned in Chimborazo Park in December 1949, before spectators who were at the scene. After a slow start the fire became a roaring conflagration. Then before the startled crowd, according to one account, the car "groaning at her seams and flinging fire out into space" suddenly heaved erect. Thus "old No. 408 died the way she had lived. Right side up and spitting sparks." These sparks signaled the end of Richmond's pioneering transit system. Richmond had been granted the honor of having the first electric street railway by the unfortunate sparks that convinced Jay Gould that such a system was not for New York. But it was really the spark of genius in Frank Sprague that brought about in

Richmond an urban transit system consistent with the expanding fires of America's Industrial Revolution.

Parallel and Paradox: Virginia's Forgotten Railroads

Nathaniel Mason Pawlett

["Backsights" No. 71: originally published in the *Bulletin*, February 1981]

The more perceptive and seasoned traveller throughout Virginia will soon begin to note the correspondence at many places between our principal highways and the railroads seen to parallel their routes. The most obvious examples of this occur along Routes 11, 29, 360, and 460, but there are many less obvious ones. In some places the railroad has virtually usurped the original route of the road, as in the case of the Chesapeake and Ohio Railroad and the Three Notch'd Road from Shadwell to Crozet. Here, the nineteenth century railroad engineers could find no better route through the Southwest and Ragged Mountains than the great natural one used by the old Indian path and the eighteenth century colonial road. In other places one often finds that the process has been reversed and that a modern road now occupies what was once a nineteenth century railroad grade. Route 666 in Bedford County, Route 683 in Campbell and Routes 615 and 818 in the Craig Valley in Botetourt are good examples of this. Still other railroads have been turned into bicycle paths. Strangely enough, at various places about the state one can also see abandoned railroad grades that have never carried any sort of traffic, due to a failure to complete the line. Good examples of these exist in the Valley and on the campus of Hampden-Sydney College, to mention only two.

A book could be written on just these abandoned and uncompleted railroads and the portions thereof. Most of them were the results of promotional schemes of the period 1865-1914 and as such are complete with their stories of visionary overexpectations, booms, busts, technological obsolescence and historical change overtaking them. Some, like the Orange and Keysville, were stillborn, while others such as the Virginia Air Line and the Craig Valley were partially or wholly constructed and operated. Some had rather long histories; others had only short lives. Some left monumental remains in the form of cuts, fills, tunnels, stone bridges and culverts; for others only the most discerning eye can detect the slight surviving traces. Particularly this is the case where the line followed one of the natural watershed routes.

Motorists driving along Route 13 between Powhatan Court House and Cumberland Court House or Route 45 between Cumberland Court House and Farmville may, by careful observation, detect traces of one of these, the Tidewater and Western, which went out of business as long ago as 1917. This line had its beginnings in the 1840s to the east in the coal pits of Chesterfield County. In 1840 the Winterpock Railroad was chartered to run from these coal mines to the Appomattox River at Eppes' Falls. It was never constructed because the Clover Hill Mining Company in the meantime had begun to build its own line to connect with the Richmond and Petersburg Railroad at Chester. By 1840 this line had 18 miles in operation and in 1845 it received a charter superseding that of the Winterpock line. As time passed lines to other mines and to Eppes' Falls were added, while the line operated under lease to the Richmond and Petersburg Railroad. After the war, in 1866, the company finally built its own pier at Osborne's on the James.

[*Image in original:* Map of the Tidewater & Western Railroad. *No caption.*]

Unfortunately, a sandbar soon began to form in front of this, and in April 1867 an explosion damaged the Clover Hill pits. This was followed by a cholera epidemic causing further reductions in production at the mines. Nevertheless the company managed to stay in business and to return a small profit. Since the company was still primarily a mining concern the railroad continued to be operated by the Richmond and Petersburg. But the Clover Hill pits themselves were beginning to be exhausted, with other companies coming to dominate the Chesterfield coal industry. By 1877 the Clover Hill property had been foreclosed and sold to the Bright Hope Mining Company.

In spite of the fact that the company remained primarily a mining one major changes were made in the rail operations. James R. Werth, the new superintendent, reduced the railroad's gauge to three feet, thus severing the connection with the R&P; moved the terminus to Bermuda Hundred, where there was a deep channel; bought new equipment; and rebuilt most of the line on a more nearly level grade. With the western terminus moved to the Bright Hope mine the line was now 32.7 miles long. Rolling stock was increased from 1 locomotive to 5, from 1 passenger car to 2, from 47 freight cars to 144, and employees increased from 21 to 83. Shortly, the railroad began to turn a profit for the Bright Hope and the company began to cast about for other sources of freight while passenger trains now ran daily.

But with the arrival in May 1883 of better and cheaper coal from the Pocahontas field in western Virginia via the Norfolk and Western, the end was in sight for the Chesterfield coal fields. In 1887 Werth and his associates formed the Bermuda Hundred Construction Company, chartered to build a railroad and its attendant facilities. The intention, of course, was to extend the Bright Hope line in order to make the railroad itself a commercial enterprise. A railroad to run from Farmville to Moseley's Crossing on the Richmond and Danville in Chesterfield County and to be called the Farmville and Powhatan had been chartered in 1884. While its act of incorporation did not call for connecting with the Bright Hope, the logic of the situation dictated that the two ultimately become one unitary, narrow gauge railroad. Just where this scheme was hatched is uncertain, but the Farmville and Powhatan group, consisting mostly of local businessmen, employed the Bermuda Hundred Construction Company to construct their railroad, paying for the work with their own corporate bonds.

In 1889 they proceeded to purchase the Bright Hope and the following year combined the two to form a 93-mile, narrow gauge railroad running from Bermuda Hundred to Farmville, with a spur to Eppes' Falls. The combined railroad worked well enough, but the business available along the line simply would not produce enough revenue to keep up the track and equipment. Gradual deterioration led to erratic operations and the name "the Faith and Poverty Railroad." The coal revenues were gone, timber hauling was virtually nil in the area, and there was little else that the line could transport. With the roadbed getting worse and worse, the combined railroad underwent foreclosure and sale in 1905.

The new management renamed the line the Tidewater and Western, made some repairs, and began to construct an extension toward Richmond. But the company, soon known as "The Tired and Weary," finally went into receivership on May 14, 1917. The impending

abandonment was resisted strenuously by local interests but became final on September 20. Shortly, the rails and equipment had been dismantled and shipped to Europe for use there.

Thus ended the saga of the Tidewater and Western. Initially conceived as an adjunct to the Chesterfield coal industry, this fundamental identity did not allow the Gilded Age's entrepreneurs to modify it to suit another purpose with the demise of that industry. In its expanded form after 1889 it was, paradoxically, a road that really went "nowhere much" and had nothing to haul. While other lines were standardizing their gauges to eliminate the necessity for transshipment of goods at junction points, this line had changed its track from 4 feet 8½ inches (which would ultimately become the standard gauge) to 3 feet, thus building in a deficiency it did not originally possess. Added to this was the fact that its line was always paralleled within 15 or 20 miles by a standard gauge railroad connecting directly to Richmond. Any one of these would probably have been sufficient to ensure the ultimate failure of the road. Together they were overwhelming.

Virginia Doesn't Need Any More Railroads—1840

Nathaniel Mason Pawlett

["Backsights" No. 72: originally published in the *Bulletin*, March 1981]

"How many Virginians does it take to put in a light bulb?"
"Four. One to screw it in and three to tell him how good the old one was."

So goes a recent version of this very old joke. One listener immediately replied: "If you could get them to agree on the need for one at all! More than likely they'd all say 'what do we need a light bulb for, it's still daylight? Wait on 'til this evening and we'll all have a drink and talk it over. Then, if we decide we really need one, and, of course, if we can afford it, we'll go get one."

Virginians have long been noted for their innate conservatism. Nowhere is this better exemplified than in the career of Edmund Ruffin. Ruffin (1794-1865), the agricultural reformer, publisher and, latterly, secessionist, was born in Prince George County. His experiments in restoring the fertility of Virginia's soil led to the publication in 1832 of his An Essay on Calcareous Manures *and to founding in 1833 of the* Farmer's Register*, a journal intended to arouse interest in scientific farming. Editing this from 1833 to 1842, he made the mistake of involving the paper in political controversy, which led ultimately to its demise. Following this, he served briefly as Agricultural Surveyor of South Carolina, a position he obtained through his friendship with Governor James Henry Hammond of that state. Returning to farming in Virginia, he purchased a worn-out 1,000 acre plantation on the Pamunkey River in Hanover County. Naming this Marlbourne, he proceeded to revive it by use of his scientific farming practices. He continued to work for agricultural reform, bringing out a fifth and final edition of his* An Essay on Calcareous Manures *in 1852. An ardent Southern conservative and secessionist, he was present at the siege of Fort Sumter in 1861, some writers attributing to him the firing of the first cannon on the fort. Unwilling to live in a country dominated by "the perfidious, malignant and vile Yankee race," Ruffin committed suicide following surrender in 1865.*

[*Image in original:* Photograph of Edmund Ruffin. *Caption:* Edmund Ruffin in the uniform of the Palmetto Guards, taken on the day following the surrender of Fort Sumter in April 1861.]

The close relationship between the location of many of Virginia's roads and railroads and her geography was remarked upon in the February 1981 "Backsights." The recent discovery of an 1840 essay by Ruffin in the Farmers' Register *provides us with some testimony on this relationship contemporary with the advent of the steam railroad, while highlighting Virginians' longstanding conservatism. Although the essay was entitled "Remarks on the Soils in General, and Particularly the Ridge Lands, of Eastern Virginia," several paragraphs are devoted to comments on the relationship between the ridges and roads, and the potential which existed for railroads along these routes.*

Ruffin's conservatism is subtly evident in his remarks on railroads, which he seems to have considered superfluous "new-fangled contraptions" at best. In 1840 few railroads had yet been built in Virginia. Still, Edmund Ruffin saw any further additions as unnecessary. It is significant that the later railroads were built along the routes he describes in this essay:

A correct idea of the configuration of the lands of the tide-water region may be had by supposing, first, an almost perfect plane surface declining by imperceptible degrees towards the sea-waters. Next, suppose this even and slightly inclined plane to have been deeply guttered and furrowed by the passage of every river, and their largest tributary streams, and more slightly by every small brook and rivulet trickling from the highest head sources of streams. Lastly, suppose the hill-sides formed by thus cutting down the channels by the waters, at first necessarily precipitous, to become gradually sloped by the operation of natural and obvious causes, in the course of thousands of years. Such is now the surface of the tide-water region, and indeed, through in a less marked manner, such is the next great region above the falls of the rivers, extending almost to the most eastern spurs of the mountains. Thus, if on any correctly marked part of the map of Virginia, any intermediate point be taken between two rivers, and a course be drawn so as to avoid the heads of every smaller stream that flows to the one or the other river, a route may be pursued for many miles, which would have scarcely any perceptible rise or depression. Such a route, to be kept always on the highest and most level ground, would of course be made very crooked by the numerous head springs of interlocking streams, flowing to both sides; and therefore no such route is ever precisely followed, by a road, or for any practical purpose. Still, if it were done, meandering and zigzag as such courses might be, they would be, to the eye, perfectly level (and very nearly level even if measured accurately,) and stretching and branching through the whole country, from the sea-coast almost to the mountains. And as nearly all the public roads are on these ridges and varying from them only to avoid too great departures from the shortest courses, it explains sufficiently why the roads may be nearly level, even when passing through a very broken and hilly country.

It is not only that these level ridges may be found and traced through their long and tortuous courses between our great rivers—as between the Potomac and Rappahannock, or York and James rivers, but also branches of these principal ridges run out between every two of all their thousands of tributary streams. And though the channels of the smaller streams are of various elevation, and generally higher in proportion as they are of small size, or remote from the great waters into which they finally are emptied, the different characters and elevations of the streams have no bearing on the intervening ridges, which, whether separating the largest rivers or the smallest tributary rivulets, preserve nearly the same general elevation, character and appearance, according to their position and distance from the ocean.

* * *

The very remarkable and continuous levels of the summits of the ridges, notwithstanding their narrowness and crookedness, suggest some other considerations which will be briefly mentioned. They present the most admirable sites for the construction of rail-roads, if the route is at all suitable to the points of supply and demand of agricultural products. The advantages for this purpose are not only in the approach to a level surface, and the slight descent that exists agreeing with the course of the heavy products; there are others in the cheapness of excavation, the cheapness of the land itself, and the abundance of timber, which still covers most of these poor lands.

The lines for railways have always been chosen to suit the interests of existing towns; and therefore there has been but little regard paid to the remarkable facilities offered by the natural formation of the face of the country. Every considerable railway yet constructed in Virginia, crosses the direction of the ridges and the streams, and no where coincides for any considerable length with the summits of a ridge. The survey, however, of the railway proposed from Petersburg to Farmville, (and which fortunately for the subscribers could not command support enough to be

undertaken,) was made for nearly its whole extent on a ridge of the kind described, (that which divides the tributaries of the Appomattox, from those of the Nottoway and Meherrin rivers,) and the report of the engineer served to confirm fully the views above exhibited, and those which caused that route to be chosen. Except for the short distance at each end, where the level route offered by nature was departed from to reach the towns of Petersburg and Farmville, the railway might have been made on as perfect a level as any alluvial flat would furnish, and without crossing a single depression or stream, except from choice, to shorten the distance of the too crooked ridge. But this level route of about 50 miles is far from being the full extent, even in a generally direct line. If the continuation of the most level natural route had been the object sought, and not the termination being made at existing marts, the same ridge might have been pursued, without any material departure from a level or from a direct route, westwardly to the spurs of the mountains, and eastwardly to the tide-water of James River. Again—if after passing above the highest head springs of the Meherrin, another branch route were to be pursued through the south-east part of Prince Edward county, and nearly along the line which separates that county from Lunenburg, and thence south and south-westwardly through Charlotte county to Moseley's Ferry, then such a continuous ridge-route would be found extending about 110 miles from the lower James River to the Roanoke, and departing no where materially from a level, except immediately at its two terminations, where necessary to descend the banks of the rivers. This example is presented to exhibit the peculiar nature and great extent of these ridges, and not to propose such a visionary scheme as the execution of any such railway, or so unprofitable an investment as any railway, in addition to those already constructed in Virginia.

Getting the Show on the Road

Howard H. Newlon, Jr.

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On July 1, 1906, the Virginia State Highway Commission began operation under the provisions of legislation passed by the General Assembly the previous March. The roads of the Commonwealth were in a deplorable state as a result of the ravages of the Civil War, the declining influence of the Board of Public Works, and the ascendancy of the railroads. The activities of the Board of Public Works, created in 1816 to develop a statewide transportation system, had been particularly important during the ante-bellum period although its promise had never been completely fulfilled, to a large extent because of its preoccupation with the James River and Kanawha Canal. During the last quarter of the nineteenth century, the Board was semi-moribund.

The first task facing the newly appointed commissioner, P. St. Julien Wilson, and his assistant, George P. Coleman, was to convince the public and elected officials that roads were important. This was not a simple task. The few automobiles that were around were still curiosities engaging in races with buggies, wagons, and trains, sometimes winning on city streets, but seldom successfully negotiating the roads available throughout most of the Commonwealth. The success of Commissioner Wilson and his successors is evident today in more than 50,000 miles of roads that connect every corner of Virginia. Today, the challenge is to convince the public and elected officials that funding for maintenance and improvement of the system must be supplied. This is perhaps an even greater challenge than that which faced the first commission since modern, permanent roads are today taken for granted by most people. The motto "Get the people out of the mud" must now to a large degree become "Keep the people out of the mud."

Portrait of Commissioner P. St. Julien Wilson.

The General Assembly authorized $16,000 for the operations of the first commission and its staff for the 15 month period from July 1, 1906, through September 30, 1907. How did Commissioner Wilson and his staff meet the challenge? His first annual report, submitted October 1, 1907, outlines his accomplishments. Some insights into how these were achieved can be gained from three pages comprising "a list of vouchers," which contains the complete disbursements by the commission for its first 15 months of operation. During this period the commission issued 145 vouchers, totaling $3,336.78. During the same period salaries accounted for $ 7,340.45, leaving an unexpended balance of $5,322.77 from the initial authorization of $16,000.

Since the first task was to assess needs for road improvements and to establish the support of the people and elected officials, it is not surprising that the first voucher, issued on July 9, 1906, was for $50 to "J. F. Knowles, agent," for two 1,000-mile railroad tickets. This expenditure emphasizes the dominant role of the railroads and the state of the available roads when the commission began its work. Two weeks later, on July 23, an additional 1,000-mile ticket was purchased. Obviously Commissioner Wilson was "on the road." The third voucher, issued on August 3, was for Commissioner Wilson's July expenses, $33.56.

The first service purchased by the commission is reflected in the fourth voucher, issued on August 4, to Hankins and Hankins for printing. August 3 was a big day for vouchers, when the bills covering the first month of operations were processed. Seven vouchers were issued, including $90.90 for a typewriter and cover, $163.64 for office furniture purchased from Sydnor and Hundley, stationery supplies from Everett Waddey, and rubber stamps and pads. Also included was a mimeograph. Thus, during the first month the office had been established and equipped. On August 4, R. L. Peters was paid $6 for lettering a sign, and the first piece of engineering equipment was purchased, a steel tape for $5.

Toward the end of August, more railroad tickets were purchased. During the first 15 months of operation, rail tickets were purchased covering 35,000 miles of travel, an average of over 2,300 miles a month!

The third month of operation required 14 disbursements, including payments for one drawing board, two months of telephone service ($7.30), and the first office amenity, a water filter and cooler costing $6.25. On October 8, vouchers were issued for the Department's first blue-printing ($2.80) and a stool, probably to supplement the previously purchased drawing board.

Of particular interest among the October expenditures was reimbursement of the expenses incurred by the three commissioners in attending the commission meeting in Richmond. As established by the General Assembly, the commission consisted of Commissioner Wilson, Dean W. M. Thornton of the University of Virginia, Professor (Col.) T. A. Jones of Virginia Military Institute, and Dean (Col.) R. A. Marr of Virginia Polytechnic Institute. The expenses vary with the distances the three men had to travel as follows: Thornton—$8, Jones—$12.35, and Marr—$18.20. These were the only expenses paid for commission meetings during the first 15 months. The need for the commission to coordinate with other state agencies is reflected in an expenditure of $6 on October 31 for a state directory.

The approach of winter with its shortened periods of daylight is evident in an expenditure of $1.25 on November 5 for two desk lights. On December 11, $48.60 was expended for a "flat top desk."

The first "mistake," or change of plan, was recorded in January 1907 in voucher 57, which is listed as "cancelled." Throughout the first six months, there are recurring payments for printing, expenses for Messrs. Wilson and Coleman, telephone service, etc. The accumulation of books and similar materials is reflected in a payment on February 1 of $12.60 to Virginia Furniture Co. for an oak bookcase. Also on February 1 is a payment of $2.50 to T. B. Hicks for "hire of horse and buggy." This represents the first payment for travel other than by train, and to some extent was the beginning of the motor pool.

[*Image in original:* Photograph of a horse and buggy in a muddy road. *No caption.*]

Most of the items purchased are readily identifiable but one, "a passometer" purchased from Everett Waddey in March 1907, deserves elaboration. A passometer is the same thing as a pedometer, a device for measuring the distance walked. Obviously, this item was important, along with the steel tapes, for the preliminary surveys that were being made by Messrs. Wilson and Coleman.

The increasing scope of operations is shown by an April expenditure of $2.73 for telegrams, and by the purchase of a second steel tape and carbon paper from Everett Waddey. From this initial purchase of carbon paper in April 1907 has evolved the multiplicity of copies required to keep those involved in today's complex operations informed.

The accumulation of information is further emphasized by a May purchase of an oak filing case. Undoubtedly, one had been purchased with the original office furniture, but it was now full, probably as a result of the carbon paper purchase.

On May 21, survey instruments were purchased from Keuffel and Esser for $360. This was the largest single expenditure during the initial 15 months, and illustrates the fact that the Department's operations had passed beyond the steel tape and passometer stage. In early June, a camera and film were purchased for $21.40 from Bell Book and Stationery. The excellent photos accompanying the first annual report reflect the effective use of this equipment.

The need for estimating project costs is illustrated by the purchase of the Department's first book. On July 13, 1907, a copy of *Gillett's Cost Data* was purchased for $4.

Towards the end of the first summer, a water cooler had been obtained. The end of the second summer (August 1907) brought the payment of $18 for an electric fan. One might speculate that this purchase would have been more cost effective at the beginning of the summer, but even then there were probably delays between need and delivery.

The remaining expenditures for August and September are routine, with the final one for $1.39 being for scratch pads!

A list of 145 expenditures made 75 years ago would seem to be pretty dull reading. But recognizing the immense task that faced the first commissioner in attempting to start a highway department from scratch, these expenditures suggest the priorities that were established. Clearly, the major effort was directed toward taking the message out to the people. As the message was received and support developed, the needed equipment and supplies were obtained. The early success of this approach is evident in a footnote to the report that stated "there has been raised for the permanent improvement of roads in Virginia during the period covered by this report, by means of bond issues, county and district appropriations, and private subscription, a sum between $500,000 and $600,000."

Subsequent efforts have created a transportation system whose value in both real dollars and other benefits is beyond comprehension. Failure to protect this investment with maintenance and continuing improvements will eventually place the system in the same jeopardy as that faced by the many corporations which in a time of inflation and falling revenues continue to pay dividends with money taken from capital rather than out of profits. Today, just as in 1906, the real transportation needs, as well as the consequences of inaction, are clear to those close to the problem.

The message is going out. In a recent speech before a local group Commissioner King stated that: "The choice is clear. Shall Virginia provide additional funds to finance continued improvements of its roads and bridges and to guarantee basic maintenance of the present system? Or shall Virginia try to get by with no further improvement of the system and possibly fall short in basic maintenance needs?"

In 1906 the people and their elected officials responded when Messrs. Wilson and Coleman took their message to them. If the response of the people of Virginia in the days ahead is equal to that of Commissioner Wilson's audience, a crisis of major proportions can be avoided.

The Beginning of Permanent Improvements to Virginia's Roads

Howard H. Newlon, Jr.

["Backsights" No. 74: originally published in the *Bulletin*, July 1981]

The approval, in March 1906, of the act establishing the State Highway Commission ended the hiatus in statewide road administration that had been created by the 1902 Constitutional revision that abolished the Board of Public Works, which had overseen the state's transportation efforts since its creation in 1816. The act gave the commission specific duties concerning "roads," "public roads," "county roads," and "highways," which were defined as "any main travelled public road of a county opened by the county or repaired by the county and used for public travel." The emphasis was on "main" roads until the secondary roads were brought into the system in 1932.

The 1906 act authorized the office of commissioner, assistant commissioner, and a clerk, plus additional assistants, all of whom were to be approved by the governor and the professors of civil engineering from the state's three engineering schools, who formed the first highway commission.

A previous "Backsights" has described the initial efforts of Commissioner St. Julian Wilson and his staff based upon an accounting of expenses of his office for the initial 15 months of operation. It was clear from these expenditures, described in the commissioner's *First Annual Report* in 1907, that the emphasis was upon travel to the various parts of the Commonwealth to secure support, encourage funding, and supply technical guidance for the initial efforts at what were called "permanent improvements" in the state's main roads. During the initial 15 months, about $500,000 were raised by means of local bond issues, county and district taxes, and private subscription. At least some indication of the specific results of these efforts may be gained from the detailed descriptions of eight projects in the *First Annual Report*.

The first highway project initiated under the authority of the newly created commission apparently was one in Washington County between Meadow View and Graham's Bridge, on which work was begun in August 1906. The project called for the improvement of a 5.11-mile section of road and an 0.75-mile section cutting off at a right angle to Cedarville. It was noted that the grade was being reduced from 15 percent to 4.5 percent on a road that was 20 feet wide to have macadam 14 feet in width for the first 7,000 feet and 12 feet in width for the remainder. The project was described as 60 percent complete at a total cost to the county of $5,443.21, or approximately $1,620 per mile. The project had required 9,455 days of convict labor.

It was further noted that the reductions in grades were, in most instances, made through heavy cuts or through rock ledges, which had made the construction both slow and difficult. The macadam, consisting of local dolomitic limestone and chert, was six inches in depth, except in a few instances where poor soil conditions required eight inches. All drilling in both quarries and cuts was done by hand. It was also stated that a full complement of men had not been available until two months after the project had begun.

The extensive use of convicts, which was true of all eight projects, emphasized the importance of the separate act creating the state convict road force that had been approved simultaneously with the road act in March 1906. This act authorized the superintendent of the penitentiary or the judge of the local court to order "any person confined in jail to work in chain gangs on the public roads of the state." Persons subject to road work were those lesser offenders confined for two years or less. Counties had the option of taking the allocations in money or "convict-days." Most chose the latter, but this sometimes served as a rather significant impediment to the volume of work that could be undertaken because, to some extent, the ability to build would depend not only upon available funds but also upon the crime rate in a given area. Thus, an important feature of the commissioner's report was a table inventorying prisoners in the jails of the state on September 20, 1907. A total of 1,142 prisoners resided in local jails, of which 150 were women and 65 were under age or responsible for a smaller fine or time sentence than would make them subject to assignment to the road force.

Of further interest is the fact that Washington County had no prisoners in its jail, which explains the delay in securing its work force on the state's first project. On the other hand, Norfolk was second only to Richmond in the number of prisoners held in jail, and this fact, coinciding with the approaching 1907 Jamestown Exposition, explains why the commission's third and fourth projects were two intended to facilitate travel to Jamestown. These projects were begun in December 1906. One, in James City County, was to connect Williamsburg with Jamestown Island; the other was between Norfolk and the Exposition Grounds. The contemporary importance of rail travel for bringing tourists to the Exposition is emphasized by the fact that the James City project began at the Chesapeake and Ohio depot in Williamsburg and ran 8.02 miles southwesterly to Jamestown. Widths of the macadamized surface over 2.1 miles of the route varied from 12 to 18 feet built with Boscobel granite and stone from a state quarry. The Boscobel granite was described as giving good results, but limestone screenings from Botetourt County were required as a binder to improve the characteristics of the state produced material.

Obviously, the railroad-road connection represents initial efforts at multi-modal coordination. It is also of interest to note that on this project the C&O hauled the Botetourt limestone free of charge to Williamsburg. The national interest in the Jamestown Tricentennial Exposition is further reflected by the fact that the Office of Public Roads of the U.S. furnished engineers, roller operators, and all heavy machinery. The total cost of the road to the county was $5,945, and the project required 4,928 convict-days. The project was completed and opened to traffic in July 1907.

By far the largest project undertaken during the first year was the improvement between Norfolk and the Exposition Grounds, which cost $38,363.50 for the road and $22,821.11 for two long bridges. This project was begun in December 1906 at the corporate limits of the city of Norfolk at the end of Colley Avenue and proceeded north to the Exposition Grounds, a distance of 3.92 miles.

The road was mostly eight-inch macadam, the first 1.23 miles of which was 28 feet wide and the remainder 16 feet wide. The stone used in the macadam was obtained from a quarry in Chesterfield County and one in Port Deposit, Maryland. Surprisingly, the limestone screenings

used a binder that was obtained from a trap rock deposit in Clinton Point, N.Y. All stone was transported by barges to wharves near Norfolk and then distributed by steam and electric railways to stations along the route. The road work was done by Mundy Brothers and required 4,928 convict-days. One might surmise that this project received attention because it would convey the expected horde of tourists arriving by ship at Norfolk to the Exposition Grounds in the same style as those arriving by rail at Williamsburg would be able to go to Jamestown Island.

In addition to the road work, two significant bridges were built. One by Sanford and Brooks and under contract for $11,978.62, one-half of which was to be paid by the county and the other half by the city of Norfolk, crossed an arm of Tanner's Creek. The other bridge, over Tanner's Creek proper, was actually a widening and repairing of a 1,782 foot long structure done under contract by John Monk for $16,831. Again the Office of Public Roads donated equipment, inspectors, and roller operators for the work.

These projects emphasize the early interdependence of the road-building efforts on different modes of transportation. In his report, Commissioner Wilson commented on the active cooperation of and material benefits derived from the state's railroads, noting that the five largest lines had, at his request, agreed to transport free of cost the convict road force, camp equipment, and all road-building equipment used in connection with the work. Little did the railroads realize that they were aiding a transportation mode that would ultimately strangle their competitive position.

In addition to the three projects described above, work was being actively pursued on five others. The second project initiated under the Commission's jurisdiction was a 9,160-foot-long relocation of the road between Staunton and Jennings Gap in Augusta County, which was initiated in November 1906. The objective of this project was to reduce the grade from 14.6 percent to about 6.5 percent. Surveys had been made for 10 miles to complete the effort. This project was 32 percent complete and had thus far required 8,323 convict-days.

Three projects were initiated in July 1907, probably reflecting the increased availability of local tax revenues coinciding with the new fiscal year. One project involved 21.53 miles of improvements between Lynchburg and Amherst Court House with a connecting section to Elon. Mundy Brothers, who had completed the large job in Norfolk, was the contractor at a rate of $4,967 per mile, except for the first mile out of Lynchburg, which cost $10,973. The contractor was furnished convict labor at $1 a day. The maximum grade was reduced from 12.75 to seven percent, except for a distance of 375 feet of eight percent grade where it was mentioned that a rubble pavement would be laid rather than macadam. This undoubtedly was the hill in Madison Heights north of the James River at Lynchburg adjacent to Business U.S. 29 near the section in the accompanying illustrations.

Another project was in Russell County between Lebanon and Cleveland, a distance of 7.1 miles. Here, the maximum grade was being reduced from 17.2 percent to 7.0 percent. Much of this work required heavy cuts and what was described as "heavy side hill construction." The road was 22 feet wide, macadamized to a 14-foot width, six inches deep. It was noted that the work had been carried out thus far with great difficulty caused by wet weather. Of the first 44.0

days, 21.5 were excessively wet. The road was described as an important one, "connecting as it does the heart of Russell County and the railroad."

In Pittsylvania County, a two-mile project between Danville and Design was under contract to T. J. Bennett for $3,537.50 per mile, with the county to furnish convict labor, steam rollers, and steam drills. Along with the other projects, this again reflects the role of the state in coordinating state, local, and private interests while persuading each to furnish what they were best suited to in a given situation.

The final project had begun in September 1907 in Chesterfield County between Manchester and Goode's Bridge. This was a nine-inch macadam pavement 16 feet in width and 10 miles long and constructed of gravel from local pits. Very little work had been done on this work prior to the end of the fiscal year as "only 252 convict-days have been used."

Just as the efforts to organize the commissioner's office in Richmond, described in the earlier "Backsights," had proceeded with dispatch and success, the real efforts at bringing about permanent improvements were well under way across the Commonwealth by September 1907. In the western areas, the objective was to reduce the burdensome grades imposed by the mountainous terrain. The major effort in Tidewater was to meet the needs of the people of the nation expected for the 300th celebration of the landing at Jamestown.

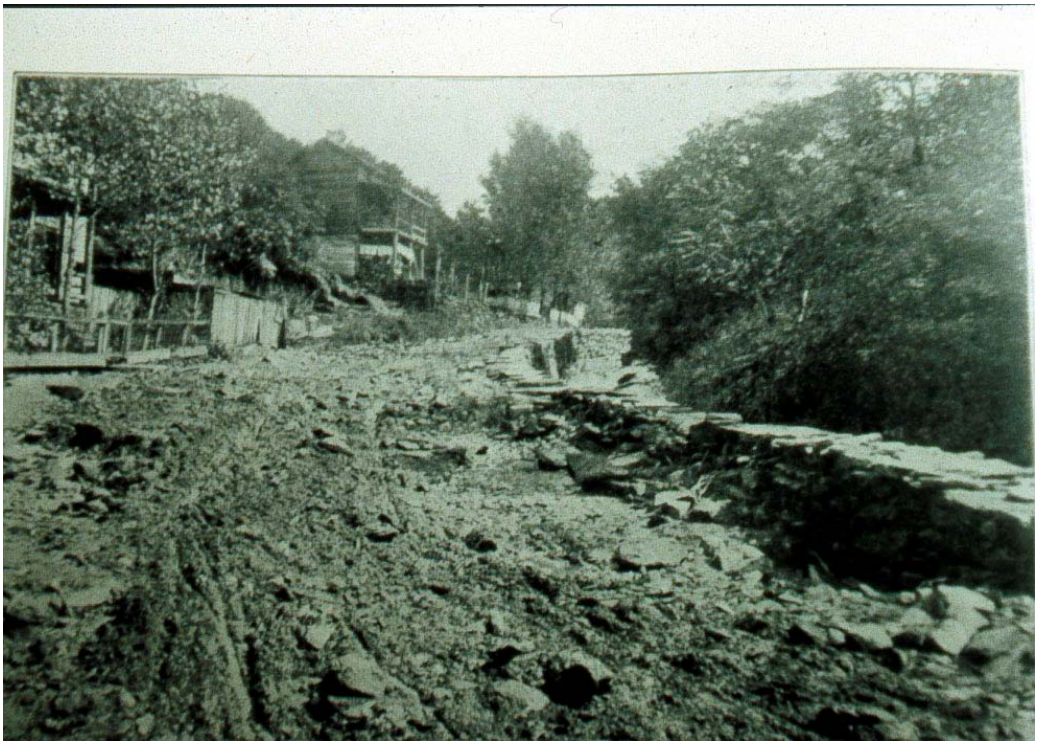
While the commission was not organized into geographical areas, it is interesting to note that of the eight projects at least one was within each of five of the eight areas that would subsequently be identified as construction districts. Only today's Culpeper, Fredericksburg, and Salem Districts were not affected by this initial effort. These areas were however included in the second year's program.

Perhaps most striking is the pragmatic approach of enlisting a variety of groups and agencies, combining public and private funds, and using donated services and materials to get the job done. Truly the adage "where there's a will there's a way" seems to have applied.

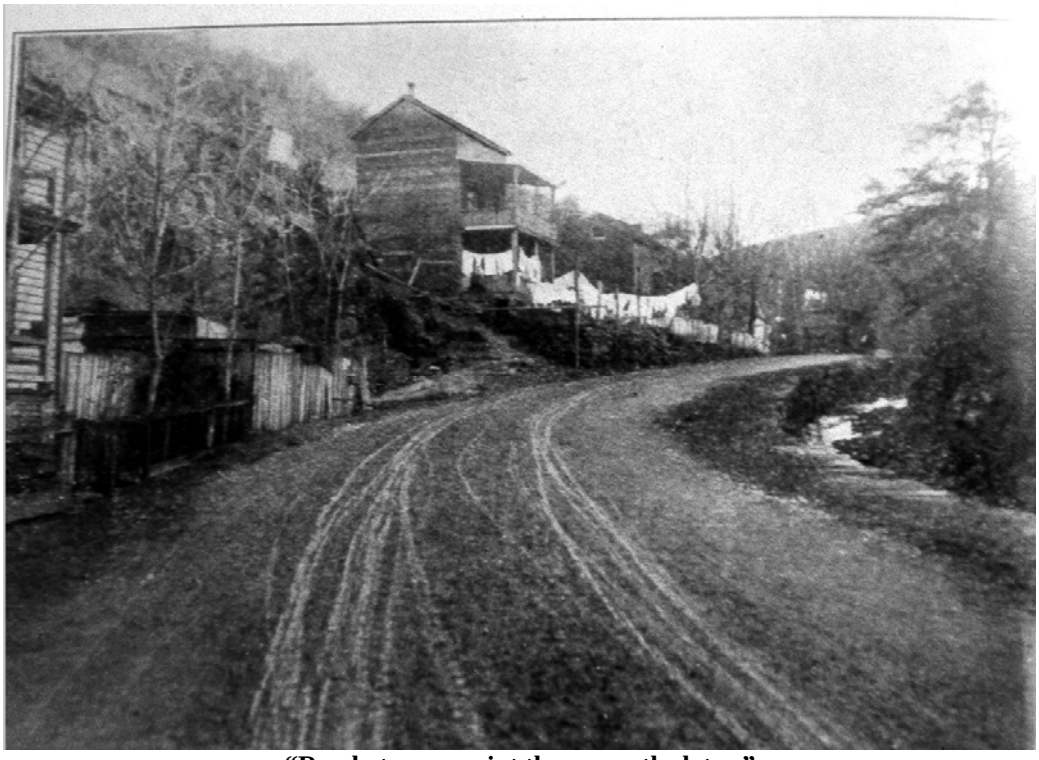
Even as the construction effort was set in motion, in his report Commissioner Wilson made a prophetic request. He wrote: "Our present State law makes no provision for the maintenance of roads improved under its operation. This is a matter of the greatest importance, as even the best constructed roads require frequent though not expensive attention to keep them in good condition, and to prevent the expensive and costly repairs that the lack of such attention will necessitate." He suggested an amendment that would require, as a condition of state construction aid, that the counties make suitable provision for maintenance.

The first step had been taken. Roads were being constructed. The challenge was to extend the system while protecting the investment in what was built. That challenge remains.

The accompanying images appeared opposite the title page in the *First Annual Report of the State Highway Commissioner* (Richmond, 1907). The original captions are given in quotation marks:



"Section of road in Amherst County before improvement."



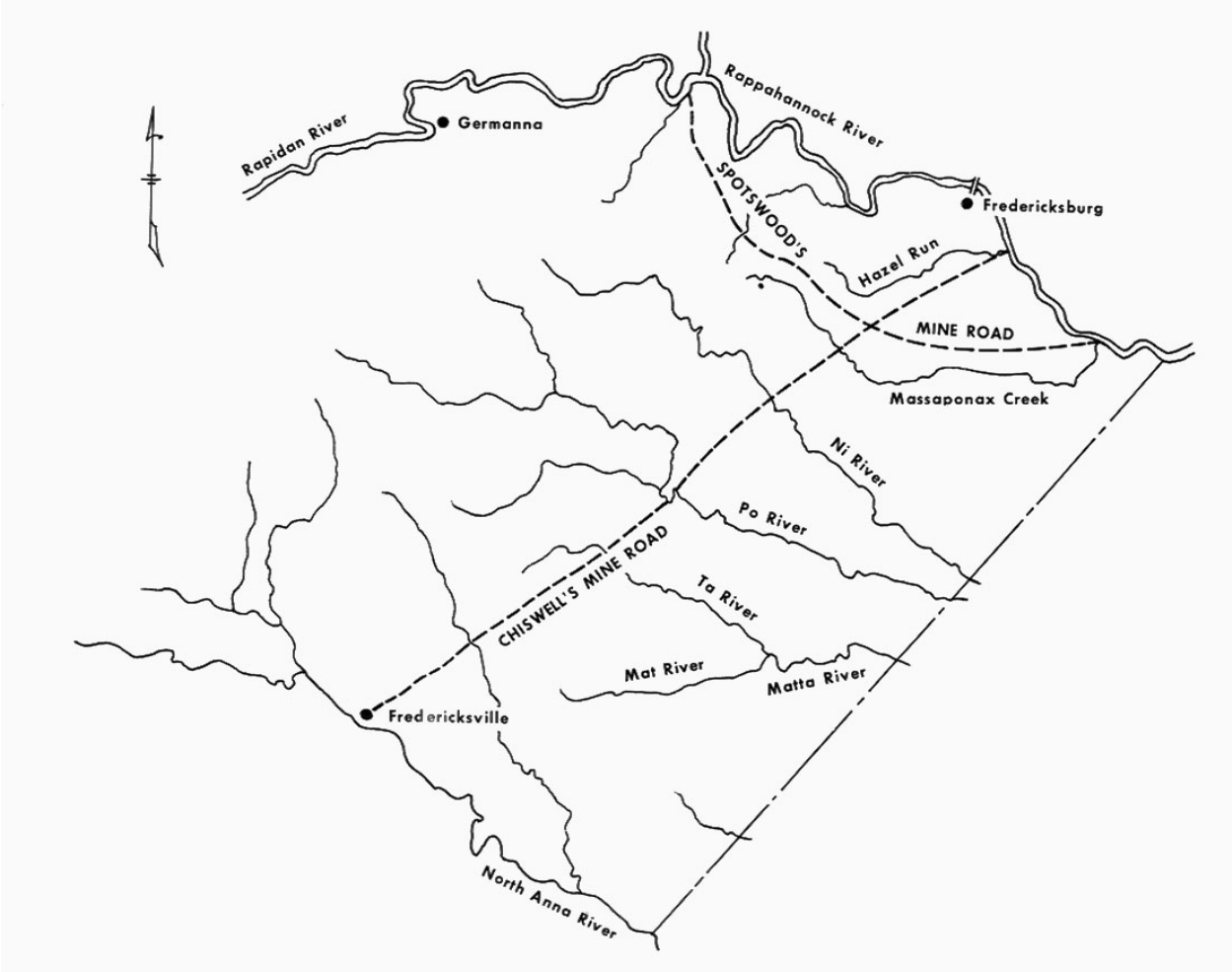
"Road at same point three months later."

Early Industrial Access Roads: Fredericksville to Fredericksburg

Nathaniel Mason Pawlett

["Backsights" No. 75: originally published in the *Bulletin*, August 1981]

While the greatest proportion of eastern Virginia's roads are rooted in an early relationship to the growing of tobacco and the rolling of hogsheads of it to market, some of them owe their existence to enterprises of another sort. If a great number still bear the term "rolling road" in their names, or are identified locally as "an old rolling road," a few still give evidence of their original purpose of access to industries of one sort or another. Travellers from Louisa to Fredericksburg today use Route 208, which follows the route of Chiswell's Mine Road, an early road to an iron furnace on the North Anna River, while Spotswood's Mine Road can be traced across the northern part of Spotsylvania County.



Map of Spotsylvania County showing Spotswood's Mine Road and Chiswell's Mine Road.

In consulting the early records of Virginia, it is not surprising to find that the government was interested in "industrial access roads" long before the recent enactments of that type here. In 1727, the General Assembly passed "An Act for encouraging Adventurers in Iron-Works" (Hening III, 228). The preamble to this act sets out the reasons for its passage:

> Whereas divers persons have of late expended great sums of money, in erecting furnaces and other works, for the making of iron, in several parts of the country; which doth greatly tend to the increasing the trade and shipping of Great Britain, and the riches of this colony, and to the employing of great numbers of artificers and other persons, more usefully than hitherto been done; and therefore all necessary encouragements ought to be given to the adventurers in such undertakings: And forasmuch as it is absolutely necessary that roads be laid out and cleared from all such iron works, to convenient landings, and also that private roads should be laid out and cleared, for the carrying wood, coal, oar [ore] and stone, to such furnaces or other works aforesaid:

The provisions of the act allowed counties to layout, construct, and maintain at the public expense roads from iron works to navigable rivers or creeks "where the iron made at such works may be brought and shipped off, and for bringing stone and other materials, for the erecting and carrying on such works. . . ." Also ordered were "such convenient causeways and bridges, as shall be necessary for carts, wagons, or any other wheel-carriages whatsoever, to pass in such roads, to and from such ironworks, with the most ease that can be . . ." The ironworkers themselves were exempted from working on the public roads, except those built for the use of the iron-works. Owners of iron-works were also permitted by the act to lay out, clear and maintain such private roads as were necessary to their business, as long as they did not "pass through the inclosed or tended grounds of any person whatsoever." Each furnace erected within 21 years after the act would be exempt from county and parish levies for five years, and these lost levies would be reimbursed by the General Assembly.

Although the iron industry had started in Virginia prior to 1622 with the abortive Falling Creek operation, it came into its own nearly a century later through the efforts of Governor Alexander Spotswood, who in 1719 formed a partnership and took out a patent for 15,000 acres of land in what would in 1720 become the giant Spotsylvania County, stretching to the Shenandoah River. By 1722, Spotswood and his partners had built Tubal Furnace on Pipe Dam run near Germanna and had constructed a road from there to his wharf on the Rappahannock River near Massaponax Creek. His example seems to have inspired emulation.

Remembered today principally because his circa 1725 house, Scotchtown in Hanover County, was later the home of Patrick Henry, Charles Chiswell arrived in Virginia in 1704. In the following years he engaged in a variety of business ventures, from being a merchant and owner of wharfs and taverns to land speculation. He also held public office at many levels of government during these years. Between his business and political careers he became friends with many influential people throughout "the Antient Dominion." Among these were the brothers Thomas and Frederick Jones, and, more importantly, one Richard Fitzwilliam, Surveyor General of the Customs for the southern colonies and a member of the Council, the Virginian counterpart to the English House of Lords. The relationship between Chiswell and Frederick Jones existed at least as early as 1704. In 1717, when Chiswell patented land (9,976 acres of it] on Newfound River in Hanover County, the land on the opposite side was patented by Frederick's brother, Thomas. Richard Fitzwilliam, however, was the key to the involvement of Chiswell in the iron business.

Fitzwilliam had in 1726 patented a 1,000-acre tract on Douglas Run near the North Anna River in Spotsylvania County that contained an iron mine and a likely furnace site. This would come to be called the Fredericksville Iron Furnace. Shortly, Chiswell patented a tract just across the North Anna River in Hanover (now Louisa) County. A year later, Fitzwilliam expanded his holdings by the purchase of an adjacent 1,000 acres. In 1728 Chiswell patented 1,000 acres above Fitzwilliam's 1,000-acre tract on Douglas Run, and Larkin Chew, a Spotsylvania gentleman, patented 1,000 acres still farther up the stream. (Chiswell would acquire this from Chew's sons in 1730.) On the same day of Chiswell's patent, September 28, 1728, Old Style, 1,000-acre patents in the same area were issued to William Robertson and David Bray, and a 350-acre one to John Key, who had been living on the 1,000 acres purchased by Fitzwilliam. On April 7, 1730, 3,000 acres were granted to Dr. George Nicholas of Williamsburg.

These machinations did not go unnoticed. William Byrd, in a letter to the London merchant Micajah Perry in the summer of 1728, commented upon the iron "boom":

> Many here are gone mine-mad, which proceeds from a passion to grow rich very suddenly, as the South Sea phrenzy did with you, and tis well if the consequence don't prove the same. Our governor is engaged with 4 other gentlemen in an Iron Work: but the distance they have to transport their Iron to water-carriage will eat out all their profit. Colonel Spotswood's work is at a stand, all his cattel being dead, and his dams carried away. I am sorry for his ill-success, but believe it will not mend if he comes over himself to look after it. His mathematical relation I believe is taken up too much with the stars, to mind the business of this dirty globe. The old President being born to be rich, has found a copper-mine on his land . . .

It might be noted parenthetically that Byrd himself would shortly fall victim of the iron "phrenzy," perhaps as a result of the example of the Fredericksville venture. Whatever the case, "the Fredericksville Company" had taken shape by February 1728 O.S., when they appeared together in a deed by which Fitzwilliam bought 600 acres for the company. Besides the highly placed Fitzwilliam, several other well-connected individuals might be noted: William Gooch, the Lieutenant Governor, Dr. George Nicholas (of Williamsburg) and Chiswell. Former Governor Spotswood reportedly also had an interest in the company. Indeed, the existence of this Williamsburg-oriented phalanx probably goes far towards explaining the passage of the act of 1727 with its extremely favourable road-building and tax provisions.

While at first glance one might expect any water connection with Fredericksville to utilise the head of navigation on the North Anna, the river upon which the furnace was situated, a closer examination will show that the shorter distance overland to the Rappahannock makes it the preferred route. Spotswood's already existing use of the Rappahannock for his iron activities may also have figured in the decision. Whatever the case, the first petition for a road to serve the Fredericksville Iron Works, as it came to be styled, was presented by Larkin Chew on behalf of Chiswell and the Fredericksville Company at the October 1728 Spotsylvania Court, located at Germanna from 1722 to 1732. Chew was a gentleman justice of the Court and was then serving as the high sheriff. The political advantages of his introducing the petition are obvious. Nevertheless, it was rejected.

A second petition, apparently introduced by Chiswell himself in November 1728, led the court to order the road to be laid off. Perhaps because he viewed the Court's tactics as somewhat dilatory, "Richard Fitzwilliams Esq^{r}" himself returned the report of the viewers to the court on

December 3, 1728 O.S. Even the prestige of a member of the Council did not suffice to get the gentlemen justices of Spotsylvania to act, however, for none of those actually appointed to view the road were present to discuss the matter. By the time the matter came up again (February 5, 1728 O.S.) the partners had retained the high-powered legal talents of Zachary Lewis to push the matter, and the road was granted as laid out by the viewers.

At the April Court this order was modified. The road was to run to the Rappahannock near Hazel Run, and to be constructed in three sections: one from the works to the ridge between the North Anna and the Mattaponi, another from there to the Ny River, and a third from there to Hazel Run. The 1727 act notwithstanding, the justices still balked at constructing the necessary bridges along the route at county expense. Perhaps "the Company" were still looked upon as "outsiders," a not unknown phenomenon even today. Further pressure may have been brought to bear, for an order of August 6 directed that a contract for a bridge over the Ny for Chiswell & Co. be let and that a view be taken of a site for one on the Po. An order of September 3 granted a continuance on this until the next court (October), when it was reported that the Ny River bridge had been let but the view of the Po site still not returned. All of this must by this time have given the appearance of foot-dragging to the authorities at Williamsburg, at least two of whom, Gooch the Lieutenant Governor and Fitzwilliam the Councillor, were also members of the Fredericksville Company.

Accordingly, the Council, sitting in its other capacity as the colony's supreme judicial body, the General Court, reviewed the affair and issued an order on October 24, 1729 O.S., which was recorded in Spotsylvania County, on the motion of Zachary Lewis, on November 5, 1729 O.S. It set out all the preceding actions of the county court, the General Assembly, and Chiswell & Co. and, noting that a good part of the road had already been constructed and that the Ny River bridge was well under way, set certain of the county court's orders aside, confirmed others and ordered that Chiswell himself should go ahead and build the Po River bridge and be reimbursed for it by the county. Under this sort of pressure from the colonial government, Spotsylvania could do little but comply with the order. Chiswell proceeded to build the bridge and the road was placed in service over its length. A year later he was reimbursed for building the Po River bridge.

This controversy was not without its ultimate effect, however, in Williamsburg. Certainly a legislative enactment of May 1730 by the General Assembly has the appearance of a compromise and a response to political pressure. It made the building and maintenance of roads to ironworks the sole responsibility of the ironworkers themselves, but exempted them from the maintenance of other roads, required them to pay county and parish levies, and to pay for timber used in bridge building. The levies would still be reimbursed from the public monies, however, for seven years after the beginning of an ironworks or seven years from the date of the act. Anyway, perhaps the purposes of the original act were by then already well served, for the road and the bridges between Fredericksville and Fredericksburg were in place and, presumably, the furnace in operation.

Chiswell now became more and more the prime mover in the Fredericksville Company, taking out on August 25, 1731 O.S., a new patent in his own name on the entire tract of 15,568 acres and including the previous patents to Nicholas, Waller, Fitzwilliam, *et al.*, and other

purchases. He also bought a plantation, located about halfway along the road to Fredericksburg, on which to subsist the oxen used for transporting the iron. Records are sketchy, but Chiswell apparently continued to operate the ironworks until his death in 1737, and his partners may have continued with it for a while longer. By the mid-18th century, however, the property was being divided into small tracts and sold off.

Today, little survives to mark the existence of the Fredericksville Furnace other than a historical marker beside Route 208 and Lake Anna. The remains of the furnace were excavated and a report prepared prior to the impoundment of Lake Anna. The name Fredericksville survives on the other side of the river in the remainder of Fredericksville Parish, now located in Albemarle County, though it once took in most of Louisa County and the northern third of Albemarle. While Spotsylvania County is Alexander Spotswood's memorial, perhaps the best memorial to Charles Chiswell and the Fredericksville Company is Route 208, which still generally follows the route laid out from the ironworks to Rappahannock River, from long-forgotten Fredericksville to the port of Fredericksburg, today connecting Louisa County and Interstate 64 with Spotsylvania Court House and Fredericksburg.

Surveyors of Still Another Kind: Part I: The Early English Experience

Nathaniel Mason Pawlett and Ann Brush Miller

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[NOTE: At the time this article was written, Ann Brush Miller, one of the authors, was the Research Historian and Executive Director of the Orange County Historical Society.]

Few professions have produced such a high-quality work dealing with their early origins as is Sarah S. Hughes's *Surveyors and Statesmen: Land Measuring in Colonial Virginia*, recently published jointly by the Virginia Surveyors Foundation and the Virginia Association of Surveyors. A credit to the historical profession and those of surveying and civil engineering, this well-written and long-needed volume fills a neglected gap on the shelf of Virginian history and provides Virginian surveyors and civil engineers a view of their history, surveying instruments and techniques down through the seventeenth and eighteenth centuries. As such, it should be in the library of every surveyor and civil engineer as well as those individuals interested in the study of the history of Virginia and the United States.

If the history of the land surveyors in colonial Virginia has been so long neglected and so hard to come at, what then of that more multitudinous but even humbler and lesser-known group of surveyors of still another kind, the so-called "surveyors of roads"? Recent studies have begun to produce a much clearer picture of these men (many of whom were also land surveyors) and the mechanics of the early road system. It is a picture of a considerably more sophisticated and better-running system than had been previously supposed, one to which our modern system of highways owes a great and as yet generally unacknowledged debt.

The conventional historical interpretation sees the Virginian road system as being rooted in the English one, and growing out of the basic English road law of 1555. Seventeenth-century Virginia records being rather sparse, it might be well to briefly examine the ways in which the English road system functioned during this time as some indication of the way things must have worked here. The larger number of the surveyors of roads of course makes it almost impossible to do more than deal in generalities because of the difficulty of mastering the amount of primary source material available in England and thus the treatment will have to remain somewhat impressionistic.

In the first thirteen or fourteen hundred years of historical knowledge about England next to nothing is known of road maintenance and management. For the fifteenth, sixteenth, and seventeenth it is plentiful, as the conflict between the users of the roads and those responsible for their maintenance arose. The characteristic mediaeval assumption of local governmental administration, well suited to the times, was that all the community's social services were to be performed by the citizens sharing them equally, according to their degree or class, without pay. It was further assumed that the level of those services was generally static over time with regard both to their kind and quantity. The idea of "progress" was yet to come. With regard to roads these assumptions held sway well into the nineteenth century in England, when the old system

was finally superseded by a system of administration fueled by taxation and especially designed to meet the needs of an increasingly complex and progressive society. But from the Restoration in 1660 down to 1832 a prolonged struggle took place against the mediaeval assumption, between the "labouring male tithables" of the rural districts who were little concerned with wheeled locomotion, and the mobile "citizens" of the developing ports and industrial cities, who constantly travelled about the country on business. Our interest here, of course, is in the earlier system.

The earliest highways in England were the still-evident ancient trackways of the Britons, probably originally animal paths, but certainly dating from prehistoric times and described as "probably irregular and winding, unmetalled and frequently worn below the level of the surrounding country . . . they ran from the higher country to points where the rivers were fordable . . . with some notable exceptions they were not durable roads but tracks from the high ground, where the Britons largely resided, to the shipping ports." The excellence of the evolved natural engineering of many of these, as well as the natural British respect for tradition, would indicate that many of these survive in use today, if not as principal thoroughfares then as sunken farm lanes or paths, perhaps even as stretches of Roman road. Nothing is known, however, of the systems under which these were laid out and maintained, if indeed either existed.

More is known of the roads produced by the Romans during their occupation of Britain, of the four great roads and numerous others, straight as arrows for long distances. Their course can still be easily traced today. At many places they still form the basis of existing main roads, strong evidence of the early interrelationship of roads and defence, a purpose mirrored in Virginia's first road appropriation in 1748 as well as today's interstate system. Designed for military purposes rather than commercial, they were probably constructed and maintained by the Roman legions themselves, aided by unskilled local labour. Their often arrow straightness up hill and down, though an apparent disadvantage today, was hardly such then, as their intention was to allow the soldiers to move quickly to points of need and to be supplied by pack horses. Although officers and other dignitaries did travel by chariot and light articles were transported by wheeled vehicles, the design of the roads for foot travel by man and beast explains their straightness. Their construction was probably supervised by a "Director of Works," a man who combined in himself the attributes of a surveyor, an engineer (military as well as civil) and an architect, and often worked in all three fields more or less simultaneously. Besides these attributes, this man required when working on roads what might be called "a good eye for the country" itself, the ability to divine the best route for a road with only a minimum reconnaissance. Thus his eye was really his most important instrument of all, much more important than his portable sun dial which he carried to fix directions (the magnetic compass still being unknown) and the cross-staff, or groma, which he used for determining straight lines. Finding the best ford across a river, the best point to cross a mountain or ridge, or the most direct, driest and best grade for a road were all functions of "a good eye for the country." True, the roads tended to be straight, but only by segments, taking advantage of these natural features. Thus this Roman might be seen as the ancestor of the eighteenth-and-nineteenth century "surveyor of roads" with the Roman soldiers and the Britons as his "labouring male tithables" doing the construction.

[Image in original: Ermine Street, Lincolnshire, England. *Caption:* Ermine Street, a Roman artery passing through Lincolnshire, is still in service.]

The next six or seven hundred years must also be traversed rather rapidly. It may be readily assumed that the ancient trackways and the Roman roads survived in service for the most part, and that the system had been considerably augmented during Roman times by the opening of new tracks or paths designed to connect to the paved roads of the Romans. We may also assume the further augmentation of this system with the continuing development of the country. The imperative of royal dominion meant that the English kings had to make the inhabitants of each locality maintain their roads and bridges without which the exercise of any form of central authority or the movement of troops to support it would have become impossible. Even so, any detailed knowledge of their systems of establishment and maintenance is lacking before the twelfth or thirteenth centuries.

Exact knowledge of these first begins with the manorial records, and then is largely due to subsequent interpretations of these manorial obligations by lawyers. Maintenance of the King's Highway was one of the duties imposed by law upon the manor. Naturally, the lord of the manor placed this duty upon the tenants of the manor. Before proceeding further, it would perhaps be well to say that the term "King's Highway" did not at this time refer to a continuous strip of land with definite boundaries and a prepared surface permanently given over to the passage of travellers, but was a rather more abstract conception like unto a modern "right-of-way" or easement over someone's land. One of the earliest English law books says that "the King has nothing but the passage for himself and his people" so that, as the judges held, "the good passage" was what actually constituted the highway, and not the "beaten track" or physical road itself. Thus, if it became "foundrous" as it usually did in wet weather, the king's subjects might in exercising their "right of passage" diverge from it to the extent of "going upon the corn" in the adjacent fields, a right clearly exercised by many of them since most of the highways were unbounded by fences. Even fences were not immune to the search for a better and drier route, a search facilitated by the fact that it was still usually foot traffic of man or beast in search of it, rather than that of wheeled vehicles, and almost any route would do. If the way was dry enough for cart and sledge traffic in summer and fall and impassable for any sort of wheeled vehicle in winter and late into the spring, why this was simply accepted as the natural course of events. Indeed, this was to be the prevailing standard of road maintenance over much of England down to the nineteenth century. Nothing in the nature of a special road surface was yet thought of beyond the "removing every kind of impediment that incommodes or molests the traveller, such as want of proper drains, over hanging trees and hedges, timber-logs, etc," or as an eighteenth century reformer rather humorously put it, everything "that prevents the roads from growing better of themselves." The Statute of Winchester of 1285, the first to deal with roads, broadens the idea of the clearing of a passage, with wording which smacks of a military, defensive or law enforcement purpose or all three, ordering "that highways leading from one market town to another shall be enlarged where as bushes, woods, or dykes be so that there be neither dyke nor bush whereby a man may lurk to do hurt within two hundred feet of the one side and two hundred feet of the other side of the way."

Prior to the Act of 1555, beyond knowing that the responsibility for maintenance lay with the manor and its inhabitants little is known of the system in use other than that much travelling

was taking place in the fourteenth and fifteenth centuries and that roads were maintained better than they were at a later date. Perhaps the manorial agents were de facto "surveyors of roads" with the tenants doing the labour. The principal members of the nobility held estates in the various parts of England and regularly travelled between them, ecclesiastical appeals to Rome meant that clerics and legal agents of various sorts were constantly afoot, and many of the common people were visiting fairs and towns and seeking employment or making pilgrimages, so that one gets a picture of a vast wayfaring life demanding a suitable system of paths and bridleways suitably maintained throughout the domain.

True, wheeled vehicles were still comparatively rare and were generally of a very primitive sort with almost everyone being afoot or on horseback. Most goods were still carried on the backs of animals, while heavy materials usually travelled by water, carried by small boats a great ways up even the most insignificant of streams. Carts drawn by stout plough horses were used by the agricultural tenants of the feudal manor and hired wagon transport for grain and heavier wares existed in the fourteenth century.

Why roads went into a decline and just when this began to occur is unclear, perhaps even illusory, but there appears to have been an actual decline in the use of roads over a two-hundred-year period from about 1350 to 1550. While fairs declined in importance, local markets began to be superseded by new methods of trade and the increase in town populations, and the landed estates were consolidated by the extensive redistributions of property attendant upon the dynastic wars of the fifteenth century, the dissolution and pillage of the monasteries by Henry VIII and his supporters, and the agricultural revolution then occurring. Estate consolidation meant that the influential class with the power to push for better roads would be travelling less and therefore be less incommoded by poor roads, while the agricultural revolution with its translation of cultivated land to pasture meant that more of the produce of the farm, previously transported to market, would now walk there on its hooves. Not only that, what constituted a "bad road" for travellers and carriers of goods would be a "good road" for these beasts. They would, moreover, often serve to convert the one to the other during their passage. And with Henry's break with Rome, the constant riding toward Rome and the Pope with appeals ceased; pilgrimages came to an end, the visits to local shrines also ceased and the old mediaeval wayfaring life began to fade from the scene. Hereafter a Chaucer would find a very different setting were he to set pen to paper.

Not surprisingly, as the usage of the roads fell off, the means available for their maintenance also declined. Previously, much of the push for better roads had been provided by the religious orders and the nobility as they owned a large proportion of the land in the country. But with the gradual impoverishment of these orders in the fifteenth century, and the confiscation of their lands by Henry, the religious orders were removed as a force in road maintenance, while the newly ennobled proprietors of the monastic lands felt little or no responsibility toward road maintenance. Beyond this, the manorial form of organisation itself was decaying under the face of changing times and the modification agriculture was undergoing. With this change fewer people were required to farm a given area and there were, therefore, fewer people available to do the necessary work on the roads. The institutions which had formerly provided the impetus and labour for the repairs had lost their resources or interest,

while there was as yet no perceived need for better roads or anyone available possessing sufficient interest to take up the task.

By the beginning of the fifteenth century, roads were again in a sort of “dark age” of their own. During the first half of the century, a half-dozen attempts were made to deal with the problem of roads by statutory enactment at the local level. Finally, in 1555, a new system of road administration was set up for the kingdom, the first designed especially for the purpose. It is from this act that the official called variously the surveyor of roads, surveyor of highways, overseer of roads, and overseer of highways derives. This act is also the foundation upon which Virginia’s early road system rests. Subsequent articles will explore the English experience under this act and the translation of that system to Virginia in the Road Act of 1632 and ensuing alterations.

(To be continued)

Surveyors of Still Another Kind: Part II: The English Surveyor of Roads

Nathaniel Mason Pawlett and Ann Brush Miller

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[NOTE: At the time this article was written, Ann Brush Miller, one of the authors, was the Research Historian and Executive Director of the Orange County Historical Society.]

As detailed in the first part of this article, the Roman "director of works," who was a combination surveyor and civil engineer and architect, can be seen as the very remote ancestor of the seventeenth-century Virginian surveyor of roads or overseer of highways. How much more important then is the Virginian's immediate predecessor, the English overseer of roads, and his experience under the road law of 1555 and subsequent enactments? This article will attempt to briefly summarise this and the relationship between the surveyor and the gentlemen justices of the county court in order that it may serve as a prologue to the next part, which will treat his Virginian counterpart and the similarities and differences of his experience in the New World.

For nearly three hundred years the Parliamentary enactment of 1555 formed the basis of the organisation of road maintenance in England and in Virginia. Here Parliament set itself to the task of constructing machinery for the maintenance of roads. Under this law and subsequent enactments the responsibility for the maintenance of all existing public highways was placed on the parish, the local administrative subdivision of the Anglican Church, and on every inhabitant or parishioner thereof. More specifically, it rested on the newly created surveyor of highways appointed for the parish, the Justices of the Peace within the County in which the Parish was located, and the landowners adjacent to the highway. All of these people could now be separately charged before a judicial body and, if found guilty, be fined for their failure to perform. But unless some particular individual could be shown to be at fault when a road was not maintained, the entire Parish was held responsible. Even if everyone seemed to have performed his duty satisfactorily, if the highway itself remained unsatisfactory then the parish could itself be repeatedly fined until the road was properly repaired. These fines would, of course, have to be paid out of tithes or taxes levied upon the parishioners, so that "failure to repair" could become quite expensive for them. This continuous collective liability was, moreover, only the beginning of their troubles.

Each parish had first of all to provide from among its inhabitants one or more men to serve as surveyors of highways for the following year, gratuitously. Then, also gratuitously, all of the manual labour, tools, horses and carts necessary for the repair work had to be furnished by the inhabitants of the Parish. "Every person, for every plough-land in tillage or pasture" (later defined as a holding of £ 50 annual value) that he occupied, and "also every person keeping a draught [of horses] or plough in the Parish" had to send for duty one cart equipped with horses, oxen, or other cattle to draw it and everything else necessary "for that purpose," along with "two able men." Making sure that no one escaped road duty, "every other householder, cottager, and labourer, able to labour, and being no hired servant by the year," had either to report for work or else send "one sufficient labourer in his stead." All of these carts, teams and labourers had to

appear on the roads annually upon the date and hour assigned by the surveyor to work under him for eight hours on four consecutive days. Later this was expanded to six days.

> [*Image in original*: George Walker's "Stone-Breakers on the Road" (1814) [see "Backsights" No. 37]. *Caption:* This image would have changed little between 1555 and the mid-nineteenth century.]

The surveyor himself had more complicated duties. On the day when the parish constable brought out to him a warrant showing that he had been nominated by his fellow parishioners and appointed by the gentlemen justices at their "Highways Session" his cares became many. From his predecessor in the office he would receive whatever balance of "highway money" was outstanding. Then, as best he might, he had to learn or teach himself just how these highway accounts were kept and how he would have to enter the various fines, compositions and commutations in order that he be able at the end of his year to satisfy the magistrates' audit and their clerk.

Next came the "police duties" of his office, both numerous and troublesome. At least three times during the year it was necessary that he "view all the roads, highways, water-courses, bridges and pavements within his precinct, and make presentment upon oath in what condition he find the same to the next justice." Owners of lands adjacent to the highways had to be made to clear these ways of any "timber, stone, hay stubble, etc.," that had been placed on them, to clean and scour "the ditches, gutters, and drains adjoining," to lay "sufficient trunks, tunnels or bridges" where cartways entered the highway from their adjoining fields, to cut "any trees, brushes, or shrubs standing or growing in the highway itself," and to keep "their hedges cut and pared right up from the roots, and not spreading into or hanging over any part of the highway" so that throughout the parish there might be "a clear passage for travellers and carriages" and that sunshine might reach into the roads "to dry the same" and allow them "to grow better of themselves," a phrase which appears quite humourous today. Besides the foregoing, the surveyor had at all times to keep a look-out for waggons, carts and carriages drawn by more than the statutory number of oxen or horses, or with these arranged in other than the statutory manner. The intent of this would seem to have been the prevention of overloading. Any wheeled vehicles being thus drawn were to be waylaid and their owners identified.

On the next Sunday after the discovery of any of these violations he had to stand up in the parish church following the sermon, name the offenders, and give notice that if uncorrected in thirty days he would do the work himself and charge the defaulters for it. Along with these unpopular duties he had to attend the Highway Sessions to make his presentments, answer the questions of the gentlemen justices, and, occasionally, to be "lectured" by them upon his duties. Attendance at Quarter Sessions was also sometimes necessary, if the parish had to be defended against an indictment for neglecting its roads or if an order was necessary from the justices to allow laying the taxes to recover the money he had to spend on the roads. If all of these did not make the surveyor of roads unpopular enough, he had also to decide upon the six days when the whole parish would turn out to work on the roads, order the teams and carts to carry or drag the stones and gravel to the places where they were needed, see that all were at work, and then provide whatever engineering and road-making skills were to be had. For those who failed to report for work the nearest justice of the peace had to be notified so that they might have fines

levied upon them, and from those owing cash payments money had to be collected. If after all this the surveyor found his own enthusiasm for the job flagging, the thought of a 40 shilling fine for each dereliction of duty provided a new impetus. If, on the other hand, he simply refused to accept appointment, he was liable to be fined five pounds for his refusal.

By the Act of 1691 the justices were also subject to a similar fine if they did not hold Special Highway Sessions every four months, although the penalty seems never to have been enforced. At one of these sessions they had to audit the accounts of the outgoing surveyors of roads, consider the lists of qualified men presented to them by the officers of the parishes, and appoint for each of them "one, two or more as they shall think fit and approve of" to be surveyors. Each justice, either individually or sitting with the others in session, had a number of other functions relating to highways such as listening to the excuses of "labouring male tithables" for not performing the labour required by law, issuing warrants for the various penalties and forfeitures required under the road law, and, sometimes, actually levying taxes on the parish inhabitants for extraordinary expenses.

All of these were, however, only the routine day-to-day duties required of a justice in general road administration. If he were so inclined he might also intrude himself into the details of the business by making "presentment to Quarter Sessions of any highway not well and sufficiently repaired" just as the grand jury could do. In his own local area he could also override the parish and the surveyor if he saw fit, and while still leaving them legally responsible for the roads, make the surveyor into his personal agent, commanding him to repair one road before another or erect signposts at crossroads. In Quarter Sessions, assembled with the other justices, he could make the surveyor expend the money in his account as they directed and could levy further monies from the parishioners if the statutory six days of labour did not suffice to keep the roads in repair. Finally, and perhaps most galling to the individual surveyor, the justices could direct that any road be widened and that the land be condemned and taken for the purpose at the cost of a further tax levy upon the parish. In this one can begin to see a creeping toward the commutation of statutory service to a money payment and, ultimately, roads built and maintained by tax revenues, which spelled the beginning of the end for the English surveyor of roads.

Just as the Virginian government of Governor, Council and Burgesses was rather freely modelled upon its English counterpart consisting of King, Lords and Commons, so the office of surveyor of roads or overseer of highways here had its origin in the English parish officer created by the Act of 1555. Although conditions in Virginia and the New World would over the years serve to alter the office and to change its name, the similarities to the English original would always remain greater than the differences on down into the twentieth century in Virginia.

(To be continued)

Surveyors of Still Another Kind: Part III: The Virginian Surveyor of Roads

Nathaniel Mason Pawlett and Ann Brush Miller

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[NOTE: At the time this article was written, Ann Brush Miller, one of the authors, was the Research Historian and Executive Director of the Orange County Historical Society.]

That the colonial Virginian was basically an Englishman has often been noted. As such, his customs and traditions were typically English and remained so for many years. Always his recourse was to "the English way" of doing things, modifying this only so much as the changed conditions of the New World might demand. In the matter of roads and transportation "the English way" meant the basic road law of 1555, with its subsequent amendments, as administered by the gentlemen justices at the county or shire level of Virginia's miniaturised version of the English government. The working of this English system of road administration was detailed in the preceding installment of this article.

The English parochial system of road building and maintenance depended at bottom upon the exaction of six days of unpaid, compulsory labour each year from each parishioner. This labour was directed in each parish by one or more surveyors of roads or overseers of highways appointed annually by the gentlemen justices of the county court. This is the system, then barely fifty years old, that was transplanted to Virginia. During the colonial period in Virginia the responsibility for roads remained almost wholly at the local level, and, indeed, principally at that level on down into the twentieth century. General supervision rested upon the county court, but the ultimate responsibility was placed upon the surveyors of roads. Decentralised authority was the principle upon which the system operated, with much depending upon the individual skills and effort expended by this man in the performance of his duties. As settlement moved inland and away from Tidewater a gradual change occurred in transportation needs as the roads ceased to be mere feeders to water transportation and, sometimes reaching a hundred miles or more, became important arteries themselves. The encounter with the mountains brought further changes, resulting in new demands, at first on the local level, later at the colonial level. But whatever the change, the "buck" stopped most often with the surveyor of roads.

Settlement away from the rivers about 1630 probably led to the passage of the first Virginian road law in 1632 (Hening I, 199), a very general and brief paragraph saying that roads could be laid out as the "Governor and Counsell" or "commissioners for the mounthlie corts" saw fit, or "as the parishioners of every parish shall agree." Although there is no specific mention of them, the language of the act echoes the system of English practice described in the preceding article, and would seem to imply the existence of surveyors of roads. They were certainly in existence by 1657, when an act (Hening I, 436) styled "concerning Surveyors of High Waise" tied Virginian practice directly to the English "course" then in existence.

> That surveyors of highwaies and maintenance for bridges be yearly kept and appointed in each countie court respectively, and that all gennerall wayes from county to county and all

> churchwaies to he laied out and cleared yearly as each county court shall think fitt, needfull and convenient, respect being had to the course vsed in England to that end.

Apparently this proved insufficient, for an act of March 1661 O.S. (Hening II, 103) went in to considerably more detail, ordering the gentlemen justices of each county to appoint, each October, surveyors of the highways, detailing the duties of the surveyors and of the parish vestries in ordering out the "labouring male tithables" to work, and providing penalties for "the said court, surveighor, vestry or person" who neglected "the executing their office."

This latter enactment seems to have sufficed until 1705, when an even more detailed one (more than three pages) was passed, perhaps as a response to the movement of settlement past the heads of navigation on the rivers and the increased importance roads were taking on. Surveyors received their usual share of attention with regard to roads, bridges and the additional levies to pay for them when special workmen were required to erect them. Surveyors were now to be appointed at some court "between the last day of April, and first day of August, yearly" as well as other individuals, title unnamed, who were to clear the rivers and creeks of trees and roots to make them safe for navigation. By this time it would appear that the English practice of presenting indictments against the parish for failure to maintain roads, if it was ever much practiced in Virginia at all, had given way to the one of making the individual surveyor of roads, or else the gentlemen justices, responsible if the legislative enactments and their attendant schedules of fines are any indication. The parish may have escaped responsibility because of its great size in Virginia. With boundaries often approximating those of the county wherein it lay, the Virginian parish was a giant when compared to the typically much smaller English parish which was often no larger than a good sized tobacco plantation.

The mode of appointing surveyors seems now to have become one fixed and generally agreeable to most of the parties involved for, with the exception of specific enactments relative to such things as signposts and roads over milldams, it was not set out in the statute books again until 1748 (Hening VI, 65). Even then it seems principally a reiteration of that portion of the previous act, with the county to be divided into precincts and surveyors appointed annually between the last day of April and the first day of August. The mechanics of this process were still not spelled out in the act, however, and it would be 1762 before this occurred.

A close examination of succeeding road acts allows one to note the gradual fleshing out of the skeleton over the years from the brief paragraph of 1632 down to the comprehensive acts of the nineteenth century. With a detail here, a proviso there, each succeeding act shows Virginian road administration becoming steadily more sophisticated. The act of 1762 (Hening VII, 577), for instance, styled "An Act for the more effectually keeping the publick roads and bridges in repair," allows an individual justice of the peace, upon his own view and without waiting for the action of the court at its monthly sessions, to convict a surveyor of roads for failing to keep his road in repair. This should have speeded matters of maintenance considerably. Perhaps to allow even speedier identification of the guilty party, the clerks of the county courts were directed by this act to post in the courthouse once every year "a list of all the surveyors of the highways within their respective counties, with an exact account of the precincts appointed for each particular surveyor . . ." To still further tighten the administration of the system, the clerks had within ten days of the appointment of a surveyor to deliver to the sheriff a copy of the court's order appointing him. Within fifteen days thereafter the sheriff had to serve

the order on the appointee and make a return of the service of the appointment to the clerk, who would then file it. Fines were prescribed for the clerks and sheriffs also.

By 1785, with the Revolutionary War behind, an increasing amount of attention was being given to the needs of the more sophisticated economy developing in Virginia and in the new nation and the road law was once again rewritten. By now the periodically enlarged act occupied the better part of seven printed pages, with very detailed instructions to county courts and surveyors and separate paragraphs for the various contingencies which regularly arose in the operation and maintenance of the road system. Most of these bore directly upon the surveyors themselves. Many of these paragraphs echoed earlier ones, but were usually sufficiently detailed to close defects identified in the earlier acts.

About four pages of the 1785 road law dealt directly with the surveyors of roads, their duties, and the problems they were likely to encounter in the day-to-day exercise of their duties. Paragraphs covered the notification of their appointment by the clerks and sheriffs, their duty to keep roads cleared and smoothed and thirty feet wide at the least, their duty to erect signposts or direction stones at intersections, their duty to construct bridges and causeys (causeways) "twelve feet broad at the least" and how the timber and stone for these could be valued and taken from adjacent property, and how such bridges, when beyond the skill of the individual surveyor and his labouring male tithables, were to be constructed by contractors, how inter-county bridges were to be had, the penalties for obstructing a road by a fence or the felling of a tree across it, and the width (12 feet) at which owners of mills were required to keep the tops of their dams which served as roads. Fines levied under the act were to have one-half of their value paid over to the informer in the case, if there was one. All prosecutions had to be commenced within six months of the offence.

In the first half of the nineteenth century the surveyor of roads would see some of the more heavily travelled roads become turnpikes maintained by private companies, thus lessening somewhat the burden that he might have borne. Still, however, the bulk of the roads in Virginia continued to be maintained by the system of statute labour. After 1865, with the dissolution of most of the turnpike companies and the reversion of their rights-of-way to the counties, virtually all of the roads came back under the old system, although the office of surveyor of roads became elective and the statute labour could be paid in the form of a tax rather than worked out on the roads. While there were some technological developments such as metal truss bridges, steam rollers and road scrapers, for the average Virginian surveyor of roads down to the twentieth century the system operated very much as it had since 1555—men, picks, shovels, mule teams and wagons, and hard, hard work. Only the advent of the automobile and the unitary system of state maintained highways that came with it would free him from this travail.

(To be concluded)

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Surveyors of Still Another Kind: Part IV: Early Orange County; the Surviving Evidence

Nathaniel Mason Pawlett and Ann Brush Miller

["Backsights" No. 76d: originally published in the *Bulletin*, February 1982]

[NOTE: At the time this article was written, Ann Brush Miller, one of the authors, was the Research Historian and Executive Director of the Orange County Historical Society.]

The three preceding sections of this article have treated the early origins of the English office of surveyor of roads, how that office was set up under the system described by the legislation of 1555, and how when transplanted to Virginia that system remained the basis for road maintenance down to the twentieth century. Recent research by the Orange County Historical Society on the history of that county's early roads has brought to light a number of excellent examples of early documents dealing with the day-to-day business of road administration. The rather providential appearance of them at this juncture allows their inclusion in the concluding portion of this article as illustrations of the specific workings of the system of county road administration in Virginia.

At its inception, Orange County comprised a large part of the Piedmont frontier east of the Blue Ridge, the Valley, and the as-yet-unsettled lands stretching westward to the Mississippi. Orange was described by the 1734 act providing for its creation as all the land west of the Parish of St. George in Spotsylvania "and all the territory adjoining to and above the said line, bounded southerly by the line of Hanover County, northerly by the grant of Lord Fairfax, and westerly by the utmost limits of Virginia." At that time, Hanover County included the present Louisa County and roughly the northern third of modern Albemarle. Lord Fairfax had as his southern boundary the Rappahannock River.

The virtually unlimited western boundary of the original Orange County was intended both to facilitate western settlement and to increase the county's effectiveness as a buffer against the French influence advancing into the center of the continent. East of the Blue Ridge, settlement and the beginnings of at least rudimentary road building in the area that was to become Orange County had begun prior to 1720 and had continued to grow through the 1720s and 1730s. West of the mountains, immigration and settlement were slightly later, beginning in the late 1720s.

During the years from 1734 to 1749 Orange was a giant county, administering roads reaching into the Alleghenies and as far southwestward as the New River near Blacksburg in modern Montgomery County. By the end of this period, Orange County proper had shrunk to very nearly its present size. The scale of the county as originally conceived made administration unwieldy, and like other large frontier counties created as a response to continued westward movement Orange lost the majority of its territory within fifteen years of its creation. The Valley region became the giant Augusta and Frederick counties, including then all the later counties in that area. Culpeper County, which then included the modern counties of Culpeper,

Madison, and Rappahannock, also became a separate entity during the 1740s. The separation of Greene County in 1838 would bring Orange to its present-day form.

Besides the road orders found in the county court order books, numerous petitions for roads, orders from the court for views of roads, returns of views of roads to the court, appointments to be delivered by the sheriff to individual surveyors, and such things as vouchers for payment for the erection of signposts survive in the loose papers of Orange County. A number of examples of these have been photographed and are reproduced here through the especial courtesy of Henry C. DeJarnette. Esq., the Clerk of the Circuit Court of Orange County. These documents with their inherent human interest serve to illustrate the day-to-day workings of the office of surveyor of roads in Virginia perhaps better than any essay could.

> [*Image in original:* Order for the Valley Road. *Caption:* A road order as entered by the clerk in the Orange County Order Book in 1745. The exceptionally long order is for the Indian Road, later the Valley Pike and Route 11 through the Valley.]
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> [*Image in original:* A road order. *Caption:* An order appointing an overseer of roads as delivered into the hands of the sheriff by a clerk. The sheriff or his deputy would then deliver it to the named overseer.]
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> [*Image in original:* County levy payment. *Caption:* A payment voucher for one hundred pounds of tobacco for erecting "two posts with Directions of the Road . . ."]

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Touring Twentieth-Century Trails

Nathaniel Mason Pawlett

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In the early years of this century a motor trip into the country was an adventure of quite uncertain result. None of the present facilities devoted to motoring then existed. Indeed, the automobile was still generally regarded as a kind of sporting toy for weekend fun. Any serious traveller over any distance took the railroads, then well-provided with all of the amenities for gracious living. To travel by automobile was to run the risk of blowouts and tire punctures (frequent), of running out of gasoline (then sold in hardware and paint stores and some general stores), of breakdowns (with resort to the local blacksmith or handyman for repairs), or getting stuck in the mud holes or suffocated by the dust. Other than for the availability of a few hotels, taverns and inns, travellers were forced to take to the woods for toilet facilities or else solicit farmhouses along the way.

Besides these hazards, the passage of the automobile itself over the roads tended to be more destructive than that of horses and wagons for they travelled much faster and also exerted attractive force on the surface materials of the roads, tearing them up and throwing them to one side at a rapid rate. The rapid deterioration of roads caused by the passage of automobiles soon raised a clamor against them in the rural areas. Suggestions shortly appeared that they be either barred from the roads or their speed severely limited. Saner counsel prevailed, however, in spite of the activities of some motorists who used the roads for racing and acrobatics. The rapid growth of automobile ownership soon converted many of the critics to owners themselves and enlisted them in the cause of improved facilities. Automobile production was 25,000 in 1905 and 187,000 in 1910. By 1915 the figure had jumped to 969,930 as the automobile's constituency continued to grow. Sometime shortly after 1910 the majority of the country's population became located in urban rather than rural areas. The automobile's transition from "sporting toy" to a necessary amenity of modern life occurred almost simultaneously, although the details of both of these shifts would be some years working themselves out.

From the earliest years of the automobile adventurous souls had taken great pride in the successful completion of a trip into the country and back, with or without mishap (usually with). These adventures grew longer and longer, inviting emulation by the more timid among the owners. Prior to 1903 most people thought a crossing of the United States by automobile impossible, but on May 23, 1903, Dr. H. Nelson Jackson left San Francisco secretly for New York. Sixty-three days later he arrived in New York, having been on the road 44 days of that time. The next year a group of enthusiasts conceived a tour from the major eastern cities to the Louisiana Purchase Centennial Exposition, then being held at St. Louis. This required a major effort for there then existed almost none of the traveller's aids we take for granted each day: through routes, reliable road maps, road signs to mark the routes, and condition reports on the various roads themselves. Fuel, repairs, and accommodations along the route were then also uncertain at best. However, the developing automobile clubs along the way were enlisted as scouts to select the best roads, map them, and, further, to mark them with confetti at the various

crossroads where the members of the tour were most likely to go astray. With the trip divided into 100-mile stages, each entrant was supplied with maps marked with the assembly points, the selected routes, and the places where fuel, repairs, meals and lodging might be secured. Finally, the American Automobile Association (AAA) was persuaded to supervise the venture through a set of committees.

On July 25, 1904, fifteen cars left New York City. At Albany they were joined by Charles T. Glidden and a group from New England. Buffalo, Cleveland, Toledo, South Bend, Chicago, and on to St. Louis, with some machines falling by the wayside but with others joining at each of the principal cities. One hundred and eight machines registered for the tour, 70 of which started and 58 reached St. Louis, a completion rate of about 83%. This journey achieved tremendous publicity due to its destination, the St. Louis World's Fair, and the fact that it carried with it reporters from the principal newspapers of the country. In addition, upon his arrival Glidden announced he was presenting a trophy to the AAA on which each year would be engraved the name of the owner-driver of the car making the best record over a long-distance tour like the one just completed. The AAA would hereafter supervise the contest, set the rules and retain in its possession the trophy.

The first of the Glidden Tours, as they now came to be called, left New York City on July 11, 1905, for an 870-mile tour through New England. These tours continued until 1910. On the one hand they proved conclusively that the automobile was more than a mere "flivver" or "sporting toy," that it was already sufficiently reliable to travel long distances if the roads and attendant facilities were made available. On the other hand, the Glidden Tours focused national attention on the difficulty of travelling for any considerable distance on the roads of the time. Together, the two accelerated the growing demand for good long-distance automobile roads, even for coast-to-coast highways!

With the growing interest in motorable long-distance roads and the continually increasing group of automobile owners, several developments shortly occurred. Groups such as the Lincoln Highway Association were formed (1913) to press for a system of national coast-to-coast roads under the aegis of the federal government, and other groups were founded dedicated to promoting certain highways, often at first called "trails" because they sometimes ran generally along the route of earlier historic roads, paths or trails. Later, this became a generic term for any road so laid out, marked, and publicized as the movement became more commercial. This was quite an important function, for as late as the commencement of World War I in August 1914, most of the roads were still almost completely unsigned and few reliable maps were available for the motorist. Motorists were forced to ask for information along the road where few people as yet knew anything about roads in the next county, much less 50 miles away. Selecting and mapping the best roads and the most direct routes and encouraging local authorities to improve them and local automobile enthusiasts and their clubs to mark them were important functions of the various trail associations which came into being about this time. They were further aided by the AAA which, as early as 1901, had begun to publish its famous "Blue Books" to advise tourists of some of the best routes and the accommodations available along them.

[*Image in original:* Photograph showing early 20th century maps and guides.
Caption: Prerequisites for automobile touring before the advent of the numbered

highway system: a 1911 Empire Tours trails map, a 1914 Blue Book and a 1922 Socony (now Mobil) trails map.]

Just when the first trail association came into existence is uncertain. The author has a map in his possession dated 1911 and published by the Empire Tours Association of New York to publicize the Adirondack Trail, the Iroquois Trail and the Onondoga Trail, the three of which covered most of the state. Presumably the routes were already marked by colored markers of some sort on signs, trees or telephone poles, or all three, for they are color-coded on the map. This would be standard practice by the 1920s. Certainly by 1915 this practice had been introduced, for in that year a considerable proportion of the Pike's Peak Ocean-to-Ocean Highway, described as "the Appian Way of America," was marked with colored bands painted round utility poles. In 1913 the National Old Trails Association was formed to preserve and improve the old Cumberland Road and the old Santa Fe Trail. In 1915 the Dixie Highway, a network of roads extending from the Straits of Mackinac to Miami, Florida, was organized. From 1914 to 1916 the Yellowstone Trail was put together, with the slogan "A good road from Plymouth Rock to Puget Sound." The year 1916 also saw the creation of the Pike's Peak Ocean-to-Ocean Highway.

Marked and advertised as they were, and otherwise existing in a vacuum as yet, these automobile trails rapidly became the principal tourist routes. Following the war, their number greatly increased. Although roads were now rapidly being improved by the localities and the states with federal aid, there was still no uniform official marking system and the trails performed a very useful function. By now the trails were becoming more commercial enterprises designed to promote the businesses along them than anything else and the trails movement soon got out of hand. By 1924 there were in existence at least 250 marked trails. Over one hundred sponsoring organizations existed, issuing maps and promotional materials. Some of the groups probably existed more to enrich their organizers than anything else. Some existed to promote road building along a certain route, and some were still principally scenic and historic–but overall the cash nexus, though often just out of sight, predominated.

Naturally, many of the best routes had more than one trail running over them. Seventy percent of one trail overlapped other routes. Another trail overlapped parts of eleven others, while one road had eight different trail markers on it for a considerable ways. Many possessed alternate sections to add to the confusion; others lost their coherence as they zigzagged past the businesses of their many sponsors. Besides the confusion engendered by their number, the conflicting political pressures they placed on the individual state highway departments to improve "their roads" made the planning process more and more difficult for these officials.

Finally, in 1924, the situation became so bad that the American Association of State Highway Officials passed a resolution asking the Secretary of Agriculture to appoint a board of Bureau of Public Roads and state engineers to create a numbering and marking system for the principal highways of the United States. A board of twenty-one state highway engineers and three BPR engineers was appointed and began its work by deciding to limit these numbered routes to existing roads in the federal-aid system, but to disregard the actual condition of the road when considering it for inclusion in the system. This, and the fact that no public hearings were to be held, served to keep the trail groups from being able to influence the proceedings. Six

regional meetings were held at which each highway department was able to nominate its most important routes and to make certain that its routes would link up with those of the adjacent states. All of these nominations totalled 81,096 miles, or 2.8 percent of total existing road mileage, which the board then pruned to a “skeleton system” of 50,137 miles.

But by now the proceedings had been well-publicized and pressure began to be exerted to enlarge the network of roads to be numbered and marked. A final figure of 75,884 miles was recommended to the Secretary of Agriculture and approved by him. With further increases made in 1925 and 1926, the total network came to 96,626 miles. This mileage was approved by the states on November 11, 1926, and was immediately put into effect with the numbered markers so familiar to all of us. With their primary functions gone the trail associations withered on the vine, although many of their designations survive on roads called variously the Boone Trail, the Dixie Highway, the Yellowstone Trail and the Lincoln Highway.

Designers of Bridges and Management Systems

Howard H. Newlon, Jr.

["Backsights" No. 78: originally published in the *Bulletin,* April 1982]

Designing a bridge or roadway and designing a management system would seem to have little in common. In today's specialized society bridges are designed by civil engineers while management systems are usually designed by graduates of business schools. Thus, it might come as a surprise that the seven men recognized as the pioneers of modern management in the 1840s and 1850s were all civil engineers. The authority for this statement is not the American Society of Civil Engineers, but rather Alfred D. Chandler, Jr., Strauss professor of business history at Harvard University. In his book *The Visible Hand: The Managerial Revolution* in *American Business,* published in 1977, Prof. Chandler states: "The pioneers of modern management—George W. Whistler of the Western, Benjamin Latrobe of the Baltimore & Ohio, David C. McCallum of the Erie, Herman Haupt and J. Edgar Thomson of the Pennsylvania, John B. Jervis of the Michigan Southern, and George B. McClellan of the Illinois Central—were all trained civil engineers with experience in railroad construction and bridge building before they took over the management of their roads."

These names are familiar to engineers. Latrobe and his famous father of the same name are synonymous with some of the earliest important engineering and architectural projects in America and Virginia. Whistler was initially involved with canals in the Northeast but died in Russia in 1849 while constructing the 400-mile railroad between St. Petersburg and Moscow. Americans may be less familiar with Whistler's engineering achievements than with his wife, who sat for the famous painting by his stepson. McCallum was the inventor of the McCallum Arched Truss. Herman Haupt and John Jervis are perhaps those most closely associated with specific engineering works. Haupt served as a colonel in the Union Army and was active in building and rebuilding many bridges in Virginia and elsewhere. Among his most notable efforts was his 400 ft. "bean pole and cornstalk" bridge over the Potomac. But before that, his construction activities with the Pennsylvania Railroad had established him as a bridge authority as evidenced by his book *General Theory of Bridge Construction,* first published in 1851 and last in 1865, which remained a standard text for many years. Jervis, who was nearly ninety years old when he died in 1885, worked on many canals and railroads, and as chief engineer of the Croton Aqueduct in New York directed completion of the dam, sixteen tunnels, and many bridges, including the famous high bridge over the Harlem River.

McClellan, of course, was a Union general, and Thomson was a driving force in the extension of the Pennsylvania Railroad, while under Latrobe's guidance the Baltimore & Ohio Railroad became a training ground for civil engineers in the nineteenth century, even as the Erie Canal had been some twenty years earlier.

Among the products of the B&O experience was Albert Fink, who patented the truss bearing his name. As described in an earlier "Backsights," the world's only known extant Fink deck truss continues in service on Route 291 in Lynchburg and has been designated as a national

civil engineering landmark by the American Society of Civil Engineers. *[NOTE: The Fink deck truss was subsequently taken out of service and in 1985 was reerected in Riverside Park in Lynchburg, where it is part of a walking trail.]*

Clearly, the engineering and military credentials of these men are well established. But what would lead the distinguished Prof. Strauss to designate them as the "inventors" of modern management practices? This designation follows from Prof. Chandler's thesis that the railroads, and to a lesser degree the telegraph, were the first geographically dispersed U.S. business enterprises. As such, they were the first to require a large number of full-time managers to coordinate, control, and evaluate the activities of a number of widely scattered operating units. The response of those charged with building and operating the railroads formed the basis for modern management.

Even though the Baltimore & Ohio began operations in the 1820s, it was not until the 1840s and 1850s that the railroads began to have a significant impact on American business institutions. Prior to that time, railroad construction and operation were essentially local enterprises not unlike those pertaining to turnpikes. But in the late 1840s and particularly in the 1850s, efforts expanded to connect the east with the west and the impact was tremendous. Some idea of the magnitude of the impact is gained from realizing that the total expenditure for canals between 1815 and 1860 was $188 million, of which 73 percent was supplied by state and local sources. By 1859 the investment in securities of private railroad corporations had passed the $1.1 billion million mark, and of this amount about $700 million had been raised in the previous ten years. Investments in single railroads had reached as much as $35 million. By comparison, only a few textile, iron-working, and metal-working factories were capitalized at over $1 million. This tremendous demand for investment capital was instrumental in the growth of New York City as the country's major financial center.

The simultaneous construction of many large railroads during the 1850s modernized methods of construction as well as those of finance. The earlier railroads, built in much the same way as the turnpikes and canals, were largely constructed by local, part-time contractors, usually farmers, merchants, or even professional men who lived along the line of the road. The large railroad projects made it difficult for the state's engineer and his assistants to oversee the work of many small contractors. There then developed a number of large contracting firms who specialized in railroad construction, often engaging in building more than one road at a time. Other natural developments were subcontractors and syndicates of contractors in response to the expanding construction tasks and attractive profits.

Coordinating the construction and then operating the widely dispersed railroads required innovations in managing an enterprise. The engineers in charge were equal to the task. According to Prof. Chandler, "They responded to these [problems] in much the same rational, analytical way as they solved the mechanical problems of building a bridge or laying down a railroad."

The basic elements of management—planning, organizing, staffing, directing, controlling, operating, reporting, and budgeting—all received attention. As the Western Railroad neared completion, operating its 150-mile line presented quite different problems than

those associated with the shorter, more self-contained lines, in that its three trains operated on a single track, meeting twelve times daily. In response to several serious accidents, the company developed an organizational structure with "definite responsibilities for each phase of the company's business, drawing solid lines of authority and communication for the railroad's administration, maintenance, and operation." The new organization called for a comparable set of functional managers, in each of the three geographically contiguous operating divisions, and then the creation of a headquarters at Springfield to monitor and coordinate the activities of the three sets of managers.

The B&O refined the organizational structure in a plan printed in a manual titled *Organization of the Service of the Baltimore and Ohio Railroad* in 1846. The plan departmentalized the function into two basic activities: "First, the working of the road. Second, the collection and disbursement of revenues." David McCallum of the Erie further sharpened the organization form in the 1850s. He formulated six principles, including (1) proper division of responsibilities, (2) authority commensurate with responsibility, (3) means of knowing whether such responsibilities are faithfully executed, and (4) a system of daily reports and checks "that will not embarrass principal officers nor lessen their influence with their subordinates." These daily reports were the real basis of the system and were required from conductors, agents, and engineers. They were consolidated into monthly statements, including for each locomotive, for example, miles run, operating expenses, cost of repairs, and work done. The Pennsylvania, under the leadership of J. Edgar Thomson and Herman Haupt, tested and further rationalized McCallum's method. Thomson appointed a new middle manager designated "controller and auditor," separated accounting from the road's treasury department, and created a legal department. He also set up a purchasing department to handle centralized buying of supplies for the company. By the 1870s the organizational chart of America's large railroads bore a striking resemblance to that of today's large corporations.

As these early managers soon learned, a constant flow of information was essential to efficient operations. This led to the devising of improved methods for collecting, collating, and analyzing a wide variety of data generated by the day-to-day operations of an enterprise. It also brought about a revolution in accounting, a specialty that emerged from bookkeeping. Thomson and his associates on the Pennsylvania made significant contributions to modern accounting practices. These new practices fell into three categories: financial, capital, and cost accounting. The first two evolved into the well-known balance sheet that provides a means for evaluating a company's performance. Among the most difficult questions faced were those concerning charging operating expenses to construction accounts versus charging construction costs to operating accounts, and when to transfer invested money to capital or property accounts. By the 1870s "renewal accounting" had become accepted practice, wherein repairs and renewal (rehabilitation) were charged as operating rather than capital expenses.

The person who contributed most to cost accounting was Albert Fink, who early in his career with the B&O had patented his famous truss. His success had led to his employment, at age 30 in 1857, as construction engineer for the Louisville and Nashville. He advanced to general superintendent in 1865 and to vice-president in 1869. Fink's aim was to determine with much more precision than heretofore had been done the basic measure of unit cost, the ton-mile. The "ton-mile" concept had been introduced by Fink's mentor, Latrobe of the B&O. Fink's first

step was to obtain accurate cost data for carrying one ton for one mile in each of his divisions. To do this, he reordered the financial and statistical data for his various departments. He consolidated some existing accounts and subdivided others. Most important he re-categorized existing accounts according to the nature of their costs rather than according to the departments in which functions were carried out. He introduced seventy-five headings with designations such as “extraordinary repairs—slides, etc.; repair of road tools; cross ties, train expense hauling; oil and waste used by cars; law expenses; damage to freight, and lost baggage, etc.” Using these figures he calculated four categories of cost: (a) movement expenses per ton-mile, (b) station expenses per ton-mile, (c) maintenance of road per ton-mile, and (d) interest per ton-mile. The total cost per ton-mile was a + b + c + d.

In describing this system, he stated that “without these data it is impossible to make a correct estimate of the cost of transportation on railroads.” Consequently, cost per ton-mile rather than earnings, net income, or operating ratio became the criterion by which railroad managers controlled and judged the work of their subordinates.

Thus it was that civil engineers, after successfully designing and constructing the railroads, transferred their rational and analytical attention to operating the dominant business enterprise of the nineteenth century and laid the foundation for the management of the giant corporations that grew out of America’s industrial revolution.

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The Eiffel Tower, the Statue of Liberty, and the Nokesville Bridge

Howard H. Newlon, Jr.

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What do the Eiffel Tower, the Statue of Liberty, and the metal truss bridge on Route 646 in Prince William County have in common? Certainly, Paris and New York have little in common with Nokesville. The Eiffel Tower and the Statue of Liberty are among the most readily identifiable national symbols in the world, have been made the object of a special empathy by local residents and visitors, and have been memorialized in song, story, and souvenirs. On the other hand, the single-span truss bridge near Nokesville currently serves the very utilitarian purpose of carrying about one thousand vehicles daily over the Southern Railroad, a job it has done for exactly one hundred years. It has witnessed the transition from a few horse-drawn vehicles, through the first sputtering automobile, to its current functions. So far as is known, the bridge has not been the subject of song or story, nor does it cause a swell of emotions or national pride. What common thread, then, connects these three structures? The commonality derives from their time of construction, their technology, and, perhaps surprisingly, from the people involved in their design and construction.

The 74-foot bridge near Nokesville and a 100-foot counterpart, on Route 653, in Nelson County were both constructed in 1882. These bridges, beginning the second century of their service to the citizens of the Commonwealth, were among seven of Virginia's metal truss bridges entered on the National Register of Historic Places in 1979. The dedication of the Statue of Liberty, whose formal name is "Liberty Enlightening the World," on Bedloe's Island in 1886 was the culmination of four series of models, preliminary erection in Paris, delivery to the American Ambassador there on July 4, 1884, and the subsequent reerection at its present location.

The Nokesville Bridge.

The Eiffel Tower was constructed in Paris during the period 1885-89. Despite its current eminence, both during and after its construction it was the subject of great controversy. While Thomas Edison thanked God "for so great a structure," the French intelligentsia, led by Guy de Maupassant, signed a manifesto protesting the erection of the Tower, and Verlaine, the poet, vowed never to visit that area of Paris again. As a result of the controversy, the French government granted only thirty percent of the $1 million cost, and its designer, Gustave Eiffel, financed the remainder from his own funds. The architect of the Paris Opera circulated a petition to have it demolished. But Eiffel's estimate of the temper of his age was correct. Despite its record height, it was erected without mishap to the workers. In the single Exposition season of 1889 gate receipts at the Tower netted six-sevenths of the cost.

As has been widely publicized, the Eiffel Tower and the Statue of Liberty are scheduled for major refurbishing in preparation for their centennial observances.

The fact that the Eiffel Tower was designed and constructed by the famous French engineer Gustave Eiffel is well known. Perhaps less well known is the fact that Eiffel also designed the structural system for the Statue of Liberty, or that before his involvement with these two structures he was a successful and well-recognized designer of metal bridges, such as his famous Pont du Garabit, built in 1879.

The last link among the three structures is the fact that the Statue of Liberty and the Nokesville and Nelson County bridges were built by the same company, the Keystone Bridge Company of Pittsburgh, Pennsylvania. Keystone was one of the most innovative and prolific of the nineteenth century bridge companies. The company, organized by Andrew Carnegie and Jacob H. Linville, was the original iron and steel contractor for the famous Eads Bridge constructed over the Mississippi River at St. Louis in the early 1870s. At that time, Carnegie was its vice-president. During construction of the Eads bridge, he founded the Carnegie-Kloman Company, which then became the iron subcontractor for the project. Carnegie continued with Keystone while expanding his iron and steel empire. In 1883, he acquired the Homestead Steel Company, which ultimately became the focus of his vertically integrated trust for which J. P. Morgan paid $420 million in 1901. The final result was U.S. Steel.

The period 1882 through 1889, during which these three disparate but related structures were built, was one of dramatic change and innovation in building technology. Even though the first and last of these structures, the Nokesville bridge and Eiffel Tower, were built with wrought iron, as was the interior skeleton of the Statue of Liberty, steel beams were used within the concrete pedestal of "Miss Liberty." While steel had been used in the cables of the Brooklyn Bridge, completed in 1883, and in some floor beams, the beams used in the Liberty pedestal were larger, performed a more critical function, and encouraged wider availability of structural steel. It is probably not coincidental that in 1884 Chicago architect/engineer William LeBaron Jenney substituted steel beams for wrought iron above the sixth floor of the Home Insurance Building, noting that the substitution was made because "steel beams of sufficient size were now commercially available."

Eiffel's design of the internal supporting structure for the Statue of Liberty was essentially a bridge truss turned on its end. Thus it made great sense that it should be built by the major eastern bridge company, Keystone.

The extent to which Carnegie's involvement with Keystone, the use of steel in the pedestal of the Statue of Liberty, and the subsequent commercial availability of steel are related is somewhat speculative, but certainly the use of steel in such a highly visible structure with which he was involved did nothing to hurt Carnegie's venture into the new industry.

Eiffel's interior structure supports the skin of the statue, which consists of 3/32-inch copper. It has all the characteristics of curtain-wall-building construction, which was exploited in Chicago but slow to be accepted in New York. The copper was separated from the iron framework by asbestos washers to restrict galvanic corrosion. (The gradual breakdown of these washers has permitted galvanic corrosion which is a major object of current refurbishing plans.)

The problems facing the Eiffel Tower as it approaches its centennial are more the result of man's response to its popularity than to natural phenomenon such as corrosion, although corrosion has naturally occurred during its hundred year life. Eiffel planned the first of the tower's three landings to support about 50 pounds per square inch. The subsequent addition of restaurants and other amenities for the annual horde of three million tourists has almost doubled the anticipated load. Thus its refurbishing is to return the structure to its original role as a monument to science and technology and reduce the pressure on the 10,000 tons of metal that make up its 1,000-foot height.

The future of bridges like those in Nokesville and Nelson County is less clear. Nationwide inventories are under way to identify those of particular significance. But the question remains: at a time of extraordinary pressures upon limited financial resources, how can structures that represent, by association, the nineteenth-century emergence of technology led by people like Eiffel and Carnegie and that stand as particular reminders of our transportation heritage, but lack the visibility of a Statue of Liberty or an Eiffel Tower, survive?

Lord Fairfax's White Post

Nathaniel Mason Pawlett

["Backsights" No. 80: originally published in the *Bulletin*, June 1982]

The whim of a Scottish nobleman, one of Virginia's earliest transportation monuments lies tucked away in the southeastern corner of Clarke County today. Thomas Fairfax (1692-1781), usually styled Lord Fairfax, scion of a family ennobled in 1627, succeeded to the title in 1710. In 1736 he came to Virginia in order to better oversee his inheritance from his mother, the giant 5,000,000-acre Culpeper or Northern Neck Proprietary. At first, he lodged with his cousin, Colonel William Fairfax, at Belvoir on the Potomac River near what would come to be called Mount Vernon, but around 1748 he decided to move to the western side of the Blue Ridge, where most of his remaining unsold lands were located. His first residence there was a small dwelling he erected on the east side of the Shenandoah River a few miles south of its present crossing by Route 50.

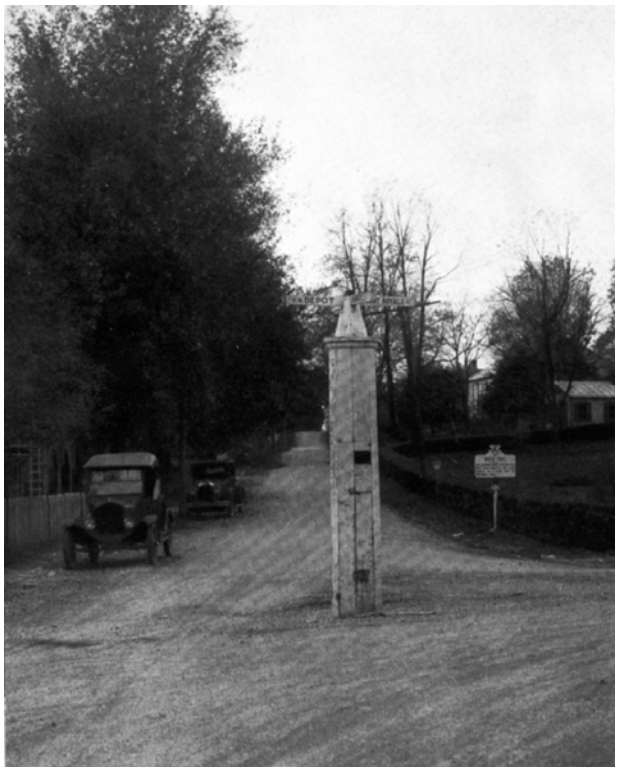
A few years later, he moved across the river to a location near the present village of White Post in Clarke County, where he erected another simple building that he named Greenway Court. A later structure some 100 feet in length, but still in a colonial, vernacular style, served his needs for housing for the rest of his bachelor life.

As virtually the most important man in Northern Virginia and the Valley, and due to his landholdings and land-selling activities, he had erected some time in the 1750s on the main road (now Route 340) a large, multi-sided, white timber post to direct travellers to his seat at Greenway Court, a "country mile" away. As with so many of the English and Scottish villages which grew up around a market cross and a village square adjacent to a landed estate, a small village soon grew up around this "white post." Not too surprisingly, it came to be called White Post after the landmark which stood in the intersection of the roads. By the early nineteenth century it contained one store, one tavern, a saddler, a shoemaker, a blacksmith and a wheelwright. After the War a church was constructed, and in the 1870s a railroad was constructed near the village to complete the picture.

Today, White Post is little changed from what it was then, a small village containing a post office and a few stores and other businesses clustered around the White Post. Photographs of 1905, 1929 and 1981 show the disappearance of some buildings, the widening and paving of the roads, hedges growing up and the erection of a historical marker to commemorate the existence of the white post. Nearby, at Greenway Court, the Fairfaxes are long gone, leaving us but a few traces of their residence in the form of surviving outbuildings.

[*Image in original:* Photograph of the White Post in 1905 [from John W. Wayland, *Stonewall Jackson's Way* (Staunton, Va., 1940)]. *Caption:* 1905.]

But the White Post remains as one of our most interesting early transportation relics as well as a monument to the presence of this noble family in Virginia. Just how many white posts



The White Post in 1929.

The White Post in the late 20th century.

have existed in the middle of the road intersection is uncertain. One account sees the original one lasting into this century, when it finally fell victim to time and the automobile and was replaced by a copy of the original. Whatever the case, the present routing of Route 340 has relegated this intersection to the status of a quiet village street, thus ensuring its preservation so that tourists two centuries hence may still be able to enjoy this rare survival: a road sign from the mid-eighteenth century.

Claibourne Rice Mason: Visionary Engineer: Part I

Nathaniel Mason Pawlett

["Backsights" No. 81a: originally published in the *Bulletin*, July 1982]

Travellers going south through the Valley along Interstate 81 will notice just below Staunton a multiple-arch stone bridge dated 1874 beside the highway and a disused railroad right-of-way more or less parallelling the highway to the south for many miles. If they are also employees of the Virginia Department of Highways and Transportation, they may know that the bridge belongs to the Department and that the highway on which they travel uses parts of the old Valley Railroad right-of-way for its route. Few, if any, of the travellers will associate the construction of the bridge or the right-of-way with one of the most remarkable men Virginia has produced: the visionary engineer and contractor, Claibourne Rice Mason (1800-1885).

Railroad bridge on Interstate 81 four miles south of Staunton.

Over the years, Virginia has produced a number of noted men bearing the name of Mason, but Claibourne Rice Mason was perhaps the most remarkable of them all. While most of the others enjoyed the advantages of education, social position and a tradition of family leadership in furthering their careers, he started out in life with no education and made his reputation as an engineer and contractor on the basis of sheer, inherent, native ability. Indeed, it is said that he never even learned to read or write, always performing his calculations in his mind in some way known only to himself. Born in Chesterfield County, Mason reputedly left home at the age of eight after being whipped twice the same day, once by his schoolmaster and then again by his father for having gotten the first one. He reacted by running away to Washington City, whence he moved to Pennsylvania to work on a farm for his board and a penny a day. When just a teenager he carried mail on horseback between two towns in Maryland, returning when he was about nineteen to be reunited with his family. With his father dead and his brother presumed dead in Tennessee, only his sister remained.

Shortly, he purchased a mule, a cart and a pick and shovel and got a small earth-moving contract on a road-building project near Alexandria. He had already had a variety of employments: apprentice to a ship carpenter in a Norfolk shipyard, foreman of a Manchester carpenter shop, and as an employee of contractors for the James River and Kanawha Canal locks then being built near Richmond. Said to be a very strong man, his physical feats sometimes equalled his mental ones, with one report having him lift and reverse a rail which three men together could not move. But it is for his mental ones that he is best remembered, becoming a well-nigh legendary figure in his own time. According to his later associates he could by some means calculate the interest on a note, or walk over a piece of ground slated for a fill or a cut and reach an accurate estimate of its cubic contents, almost instantaneously. Just how this worked for him is uncertain, for he himself could not explain the process. But he was certainly at no disadvantage when bidding on projects, or for that matter when put up against a professor of mathematics at the University of Virginia. With the professor working it out on paper and Mason in his head, Mason always got the correct answer first.

With the state charter of the Midlothian in 1820 the railroad age dawned in Virginia, and with it the career with which Mason would be involved for the rest of his life. It is hard today for us to conceive what an improvement over the mule and ox-drawn wagon and cart the railroad was, and to the people used to them how exciting was the Midlothian, which linked the coal fields of Chesterfield County with the James River. Primitive by later standards, it used a series of inclined planes and horse-drawn carriages to move coal to wharves below the falls on the James River.

One of the men who built the Midlothian was Mason, who had a contract for some of the grading and who assisted with the surveying. Experience gained on the Midlothian no doubt made him a likely candidate for other Virginian railroad construction and he had a hand in building the Petersburg & Roanoke, chartered in 1830, the Baltimore & Ohio and its Baltimore and Washington line, and the Richmond, Fredericksburg & Potomac. The next four years were taken up with laying tracks for these. On the Baltimore & Ohio and the Richmond, Fredericksburg & Potomac he also built turnouts and depots.

All of these still had wooden rails with iron straps mounted on top along which the wheels of the trains traveled. The land required for the right-of-way was usually donated by the owners, who also often had their slaves cut crossties and help with the construction. Usually English-built locomotives were employed to pull the cars, reaching speeds of 12-15 miles per hour. Most stock offerings were subscribed in a short time by people living along the route and at the terminal cities and towns at either end. With only minimal grading required, timber bridges erected rapidly and the goal being to get the line in operation and producing revenue, construction usually progressed rapidly. The Petersburg & Roanoke, for example, was chartered in 1830 and by October 1832 had half of its sixty-mile-long route open to daily trains.

In 1835 Claibourne Rice Mason first became involved with a project which would keep him occupied for the rest of his life, the Louisa Railroad, which became the Virginia Central and, finally, the Chesapeake and Ohio. As he told it in 1873:

> It was in the summer of 1835, that three of us at a little place in Hanover, called Taylorsville, determined that it would be a profitable thing to build a railroad from that point to Louisa C. H.

> and we subscribed $15 paid up capital, the three being W. D. Taylor, Speaker Robertson and myself, and the subscription being $5 a piece. The month after, a meeting was held at Louisa C. H. and $100 was subscribed, and the Richmond & Fredericksburg R.R. Co. agreed to send an engineer to survey the route from Taylorsville to Louisa C. H.
>
> A company was then formed and books were opened at Frederick's Hall, Bird's Eye Mills, Gordonsville and Louisa C. H., and at Capt. Frederick Harris['s] being the first President. The first five miles was then let out, the letting taking place at Taylorsville. The first mile and a quarter was taken by Williams & Hagerty, the second mile and three quarters by C. R. Mason, and the third by Jno. Hackett, of Caroline. The same evening, after dinner, I went up and started the work, throwing the first shovel of dirt, and never since that time have been out of the service of the company in some shape or other.

Moncure Robinson, who had designed the Midlothian, was the engineer sent to do the survey. The first twenty-mile section opened on December 20, 1837, using rolling stock of the Richmond, Fredericksburg and Potomac in return for a part of the Louisa's receipts. A stable car accompanied each train. It contained four horses to be used to help the engines over several of the steeper grades.

Since the Louisa had to maintain the roadbed, Mason was also appointed superintendent of repairs for the road in 1837, a position in which he along with everyone else in the company had to take a salary cut due to the Panic of 1837. With time his responsibilities grew as the line extended to Gordonsville in 1840, and to Charlottesville in the late 1840s, by that time having seventy-two miles of track in operation. In 1850 the line was reorganized as the Virginia Central and a section built from Taylorsville to Richmond, giving the line its own connection to navigable water. By this time, too, the idea of taking the line on to the Ohio River was in many men's minds. In 1851 a separate company was chartered to build with state support a railroad and four tunnels through the Blue Ridge, and the next year Mason resigned as general superintendent of the Virginia Central, a position he had held for fifteen years.

(To be continued)

Claibourne Rice Mason: Visionary Engineer: Part II

Nathaniel Mason Pawlett

["Backsights" No. 81b: originally published in the *Bulletin,* August 1982]

Following his resignation as superintendent of the Virginia Central, Claibourne Rice Mason began work on the railroad through the Blue Ridge with its attendant floods, landslides and snakes. Claudius Crozet, the Board of Public Works' engineer, and the surveyor of the Midlothian, directed construction. By working around the clock, Mason's men overcame all obstacles and completed the last of the tunnels through the Blue Ridge in October 1857. While Mason and Crozet were constructing the line through the Blue Ridge, track was also being laid west of the mountains by the Virginia Central, reaching Staunton in 1854, Millboro in 1856 and Clifton Forge in October 1857 before the tunnels through the mountain had been completed. The Virginia Central was now 204 miles long.

Meanwhile, Mason was actively engaged in other enterprises. From 1855 to 1860 he was building that part of the Orange & Alexandria Railroad between Charlottesville and Lynchburg. With his return to full-time contracting in 1852 with the Blue Ridge project, Mason developed a system of side partnerships to enable him to handle larger projects than he could have alone. This system was also used on his Orange & Alexandria project and thereafter as he got more and more contracts. At one point after the War two and half ledger pages were necessary to list all of his side partnerships. Many were contractors whose abilities were known to him while others came from within his own organisation. For these men his system seems to have been to reward good performance with partnerships rather than high salaries.

Perhaps Mason's return to contracting had something to do with his married life, too. In 1838 he had at a ripe age (38) married Drusilla Boxley of Louisa County, and, while serving as superintendent of the railroad, lived for some time at Frederick's Hall in Louisa and, later, at Mechum's River Depot in Albemarle. Now, with his family perhaps well along, his attention returned to building the railroad westward. About 1855 he moved his family on to Staunton, later buying an estate called Wheatlands west of there near Swoope's Station on the Virginia Central. Mason always regarded contracting as a sometime thing anyway, and farming as his primary occupation. Wheatlands was only one of several large farms which he came to own, but situated as it was adjacent to the railroad it became the logical winter pasture for the many mules he used in his business as well as a place to store his spare construction equipment as the road progressed westward. Since he also ran stagecoach lines he pastured those horses at Wheatlands too.

Prior to 1861 not too much was done on the railroad west of Clifton Forge. The Covington & Ohio Railroad Company had been chartered in 1853 to build this portion which, it was expected, the Virginia Central would later take over. The route was laid out by 1855 but the Board of Public Works compelled Charles B. Fish, the engineer, to run the line by White Sulphur Springs which required many tunnels, cuts and embankments. Some grading and tunneling had been completed before Fort Sumter, but work stopped then.

Like so many Virginians, Mason was opposed to secession, but once Virginia was committed to the Confederacy he supported her wholeheartedly, as Stonewall Jackson said "drawing his sword and throwing away the scabbard." At his own expense, he recruited a company at Staunton in July 1861. C. R. Mason's Company, Virginia Volunteers, were called the Staunton Pioneers but soon became Company H, 52nd Regiment, Virginia Infantry under general Edward Johnson, while Mason became a captain in the army's road and bridge builders, the Pioneer Corps. Then sixty years old, one of his first tasks was the maintenance of roads and bridges from Staunton to the Greenbrier River and from Warm Springs west to Huntersville (now West Virginia) so that supplies could move to Confederate forces in those areas. When Jackson and Johnson came together for the battle of McDowell in this area in the spring of 1862, Mason came to the attention of Stonewall, who apparently recognized a kindred genius for he had him transferred to his army and made him a lieutenant-colonel. For some unknown reason Mason, however, never liked that title and always demanded that he be addressed as "Captain," perhaps the title he had always been addressed by in his railroad days.

If not already a legendary figure, Mason rapidly became one. At Port Republic his rapid bridging of the south fork of the Shenandoah River by driving wagons into the river, tying them together and planking across the tops allowed the army to move rapidly as was Jackson's wont. His most famous adventure of this type, however, occurred during the Seven Days battles near Richmond. As recounted in an article published in 1876 in *Frank Leslie's Illustrated Magazine* it makes extremely interesting reading.

General Jackson had just arrived from the Valley, and was encamped on the north side of the Chickahominy. The fighting had commenced, and, to Jackson's mind, was going against the Confederates. The roaring of artillery was sounding nearer and nearer, strong evidence that the Union forces were driving the Southerners Jackson tried in the morning to get across the river higher up than where he was then encamped, but was prevented by an opposing fire. The battle raged, and Jackson became excited and more impatient every moment to cross the river. He bethought of Captain Mason, and a courier was dispatched for him. The captain, just about that time, was cooking his dinner in a skillet. He had bacon and greens that day—poor fair for a millionaire—and he was "chuncking" up a fire under the bacon and the greens when the courier rode up in hot haste.

> Courier: Captain Mason, General Jackson desires to see you immediately.
> Captain M.: Tell the general I'll be there directly. He continued his cooking operations. In a few minutes more another courier came rushing up to the skillet of bacon and its owner.
> Courier: Captain Mason, General Jackson wants to see you immediately, without delay in his tent.
> Captain M.: Tell the general I'll be there in a few minutes—just as soon as I finish cooking some bacon and greens.

The captain commenced on the favorite Virginia dish, but before he had made much headway, Major Wm. Allan, Colonel Jones and another officer of General Jackson's personal staff rode up "without delay" to Jackson's quartermaster.

> All Three (sotto voce): Captain Mason, General Jackson is very anxious to see you at headquarters, instantly. He is very impatient at your delay.
> Captain M.: Tell General Jackson I'll be with him as soon as I finish eating my bacon and greens—in ten minutes.

And he kept his word.

General J. (anxiously): Captain, do you hear those cannons?
Captain M. (solemnly): Yes, I do, General.
General J. (pausing): They are very regular.
Captain M.: Yes, General, they are.
General J.: I'm afraid Huger has not come up to Magruder's support. It is very important that I should get my artillery across the river as soon as possible. I can get the infantry over immediately, but I do not want to; I am anxious to cross over with the artillery first, and at the earliest possible moment (anxiously). Now, how long before you could make a bridge to rush the artillery across on?
Captain M.: I can't tell until I see the ground first and select a crossing. I think I can make it in two hours.
General J. (brightening up): Are you not too quick in your calculations? Can you have it done in that time—two hours?
Captain M. (smiling): Well, I don't know; I'll go and see and come back and let you know.
General J.: Do, Captain.

The Captain went and made a survey of the river and returned to headquarters.

General J.: Can you do it, Captain?
Captain M.: Yes, General; I can make it in two hours.
General J.: Good, Captain! Good! (Feelingly) If you ever wish to render your country a service, now is the time to do it! Have the bridge made at the quickest possible moment, as I do not wish to cross until the artillery can go first. (Abruptly) Do you hear these cannons? They are very rapid and regular.
Captain M.: Yes, they are.
General J.: Captain, what force do you want?
Captain M.: About a thousand men and forty to fifty of John Harman's wagons.
General J.: You shall have them, Captain. Do you want anything else—any axes?
Captain M.: I have plenty of axes I captured the other day.
General J.: You shall have anything you want. I will order the engineers to have the men and wagons sent to you immediately.

The men and wagons were sent to Captain Mason, and at 2 p.m. he commenced building the bridge across the Chickahominy. The bridge was three hundred feet long. It is stated that about the same hour the engineers went to drawing up plans and specifications for the aforesaid bridge in their tents, as they were ordered by "Stonewall" to render all possible aid to Captain Mason. When close on four o'clock, the scientific gentlemen and red pencils came upon the scene of action and beckoned to Captain Mason to draw near, that they had a drawing for the bridge, and they wanted to explain to him how he was to proceed with it, and commenced unfolding the bridge diagram on paper:

Captain M.: What have you got there—pictures?
Engineers: A plan for the bridge, Captain.
Captain M. (smilingly): The bridge is built, gentlemen.

At that moment the Captain turned round, and he saw General Jackson and his staff approaching him, the army on the march and the artillery in advance.

General J.: I am here, Captain; you see what confidence I have in you. It wants ten minutes to four.
Captain M.: All right, General; the bridge is finished. But just wait two minutes until I throw some dirt over that crack to keep that off mule from shying and tumbling into the river. You can go ahead now, General."

Jackson went ahead, and behind him the scientific men with the “pictures” and pretty red pencils. Captain Mason returned to his tent, but had not proceeded far when he heard the ringing order, away in his rear, “Charge!” Looking round, he saw a cloud of dust, horses and cannons going like the whirlwind in the direction of the sound of the cannonading. Jackson’s flying artillery arrived just in the “nick of time” to turn the tide of battle in favor of the Confederates; he opened up upon the Union forces, as usual, in their rear (where they always expected him afterward), and threw their ranks into confusion. General McClellan has to thank Captain Mason, his skillet of bacon and greens, and Stonewall Jackson, for his defeat.

(To be continued)

Claibourne Rice Mason: Visionary Engineer: Part III

Nathaniel Mason Pawlett

["Backsights" No. 81c: originally published in the *Bulletin*, September 1982]

Another of Mason's legendary wartime exploits is noted for its brevity. Once when Jackson was making one of the flanking movements for which he was noted, he mentioned to Mason that he was worried lest his mules bray and give away his maneuver. "Tie their tails to their bellies, General," was Mason's laconic reply. "A mule won't bray without first raising his tail."

By late 1863 Mason was back at Staunton as a quartermaster assigned to the Augusta County home guard unit and working to maintain the Virginia Central in a serviceable condition for the transportation of troops and supplies. Since the road was a frequent recipient of the attentions of the Yankees, this was no small task in itself. From the first attack in May of 1861 the Central had its bridges, depots, rolling stock, tracks, and ties destroyed. Repairs were usually made immediately, but as the war continued this became more difficult as the supplies on hand began to be used up. The continuing erosion of manpower was also a problem, although troops were sometimes despatched to help repair the line. In 1864, for instance, raids destroyed eighteen bridges over thirty feet long, thirty-six cars, seven water stations and 20,000 crossties. Nevertheless the railroad continued to operate, moving 188,000 troops some 2,600 miles that year. Indeed, parts of the 204-mile line were still operating at the war's end in April 1865.

The war's end found Mason, reputedly a millionaire at its beginning, reduced to poverty. Beginning economic life again at age 65, in the next twenty years he rebuilt his fortunes to the extent that he was probably worth more when he died in 1885 than he had been in 1861. The first order of business was the rehabilitation of the Virginia Central. Within six weeks of the surrender, trains were again running from Richmond west to the Rivanna River at Charlottesville. Shortly, the road was also open from Clifton Forge east past Staunton to the Mechum's River Depot east of the Blue Ridge in Albemarle County. The bridge there, which Sheridan had destroyed in 1864, was still out, as was the one over Moore's Creek at Charlottesville. Meanwhile, in order to provide through passenger and freight service over the line, Mason ran a thrice-a-week service by horse-drawn railroad car from Moore's Creek to Mechum's River. By the next spring the whole line was back in service.

Thoughts now turned to the extension of the line to the Ohio River, a project many thought dead as a result of the war. Little help could be expected from either prostrate Virginia or newly-created West Virginia through which the new line would run. Travel to the Ohio continued by stagecoach from Clifton Forge west as plans were matured. In May 1867 the Virginia Central stockholders agreed to extend the line to the Ohio. Some four million dollars had been raised for the project. That same year Mason completed the line from Clifton Forge to Covington, where the new line would begin. The next year the Virginia Central became the Chesapeake and Ohio, a new corporation which received the interests of Virginia and West

Virginia in the old Covington and Ohio Railroad and had six years to build the railroad to the Ohio. Mason was to have a substantial part in all of this.

As detailed by James Poyntz Nelson in *The History of the Chesapeake and Ohio Railway Company*, construction problems were tremendous due to the nature of the terrain and its geology. The first segment ran roughly along the line of the old James River and Kanawha Turnpike, but beyond that the railroad took the line of the Greenbrier River to the New River, thence along its gorge to the Kanawha and followed it to Charleston. For contractors to operate in the wild fastnesses of the New River gorge was almost impossible, for few roads entered to allow the transportation of men and materials. At various points along the gorge it was necessary to bring supplies and material to the working site by lowering them from the top down the steep hillside to the river. The geological nature of the mountains was such that heavy slides continually occurred and the roadbed itself was subject to upheavals due to the pressure within the mountain. Tunnels built for a double track were compressed by this pressure to the point where they would take only one track. Even after construction was nominally complete, repairs, modification and reconstruction went on for years.

One of Mason's most impressive achievements on the line was the monstrous earthen embankment called Jerry's Run Fill which crossed Jerry's Run between Covington and White Sulphur Springs. Completed, it stood 575 feet high and contained 1¼ million cubic yards of earth. It was the subject of frequent landslides, one of which carried away Mason's cabin and mule barns with part of the surrounding forest.

Besides this fill, Mason also built several tunnels. The Lewis Tunnel, some 4,600 feet long, was located about a half-mile from Jerry's Run. Commenced under the old Covington and Ohio regime and begun again in 1868 under the Chesapeake and Ohio, the tunnel had broken three contractors before Mason came at it. Although a superstition had by this time arisen that the Lewis would never be completed, Mason finished it in 1873, a little over a year after he took over the project.

Construction had also begun at Huntington on the Ohio River and worked eastward towards the mountains. On January 29, 1873, the two groups met west of Hawk's Nest, West Virginia. Claibourne Rice Mason, who had thrown the first shovelful of dirt on the Louisa in 1836, measured the last rail with the same pocket rule he had used to start construction then, and helped drive the last spike. The Chesapeake and Ohio was now 419 miles long, more than twice the length of the 1861 Virginia Central. It would continue to grow.

A ceremonial train set out from Richmond on Thursday evening, January 23, and reached Huntington on Wednesday night, January 29, beginning the return trip the following morning. It reached Staunton on the night of January 31. An article in the Staunton Vindicator called "The Great Railroad Opening" contained an interview with Mason, who the reporters styled "the father of the road." Mason said in part:

> I have labored for them in every capacity, blacksmith, carpenter, foreman of machine shops and car building, section master, director and superintendent, and I have never lost a day from pleasure or sickness. I was superintendent from '37 to '52. And in '65 at the end of the war, while the road was torn up, Hoge and myself ran a little horse car from Mechum river to the

Rivanna. I have been a contractor on it for many years, and at one and the same time, I was interested in work on the road, 27 miles long, and estimated at $1,500,000. At one time in 1842, the credit of the company that was carrying on the line under the name of the "Louisa R.R." was not good for the hire of a negro [slave], and the hiring bonds given for hands had to be given by President Fontaine or Kimbrough and myself as individuals.

There was no idea of carrying the road to the Ohio when it was first commenced, nor for years after. And when it was first thought of running a road this side of the Blue Ridge, it was not with any idea of a tunnel through or a temporary track over the mountain, but what was intended was to build a good macadamized road over the mountain and wagon goods and passengers over to the termini of the roads on either side. It was about 1846 when the idea of going to the Ohio gained real ground.

In 1867, I undertook to finance and finish the road from Jackson's river to Covington and did it. I subscribed $20,000, the largest single subscription I ever made, though I had before that subscribed $100,000, but I felt, that though it was a risky business, it must be done and as you know it went through successful.

Reporter: "We heard that they were telegraphing for you to go to New York before the last rail was laid."
Mr. Mason: "Yes: But you know how a man feels about a child he has attended from sickness and weakness to health, he wants to be there when it gets on its feet. I had, I suppose, fifty telegrams and letters for me to come to New York and Baltimore and Kentucky, but I felt that I couldn't leave. So I staid and measured the last rail, with this old rule, which is the same rule I measured the first rail laid on the old Louisa railroad." Here Mr. Mason pulled out of his pocket an old carpenter's rule, with the brass mounting worn away by use.

(To be continued)

Claibourne Rice Mason: Visionary Engineer: Part IV

Nathaniel Mason Pawlett

["Backsights" No. 81d: originally published in the *Bulletin*, October 1982]

So much for the myths of old age and enforced retirement. Claibourne Rice Mason was 73 years old when he completed the C&O, and nowhere near the end of his remarkable career. With its western terminus established on the Ohio River, the Chesapeake & Ohio quickly began to take on national stature. Penetrating many of the formerly isolated areas of Virginia and West Virginia, it allowed the development of their coal deposits, iron ore and other minerals, as well as their timber and farmlands. The Greenbrier and Homestead resorts survive today principally because of access to this railroad, a benefit not unappreciated by those who have enjoyed their hospitality. The railroads' brochures and directories of course lost no time in pointing out all of these resources, as well as the recreational possibilities and the mild climate, and that the C&O provided the most direct route between the coast and the Ohio River along with the best grades. With the development of larger and better locomotives, longer and more comfortable passenger coaches with heating and ventilating systems, and the air brake and gooseneck coupler, railroads were finally coming into a dominance in land transportation that they would enjoy until the automobile reached its maturity in the 1930s.

[*Image in original:* Portrait of C. R. Mason. *Caption:* Claibourne Rice Mason [from Dixon Merritt, *Sons of Martha* (New York, 1928)].]

But Mason was no longer alone. Two of his sons joined him after the war. Horatio Pleasants Mason had worked for his father as early as 1857 while still a teenager, and Silas Boxley Mason, an expert when it came to mules, took charge of purchasing and training the Mason company's many draught animals. Besides these members of his family, Mason continued to look out for good men, some of whom became partners after starting as employees of his. One of these, Charles Eugene Hoge, became the Hoge of "Mason & Hoge," as the company name became about 1870. Hoge, who had helped Mason run the "little horse car" from Moore's Creek to Mechum's River Depot immediately after the War, was chief clerk and, later, a partner and an officer of the firm. Although he was a good manager, Hoge's principal talents lay in the financial area, and he later withdrew from the company to concentrate on banking, although his name remained on the company letterhead for many years.

With the further momentum his triumphs in building the C&O gave him, Mason continued construction work unabated by the financial panic of 1873 and the ensuing depression. He was busy grading the Valley Railroad from the fall of 1873 on into 1874. The stone railroad bridge near Staunton that belongs to the Department bears the date 1874. The financial stringency of 1874 finally stopped work on this road, however, and railroad contracts became harder to come by, so that Mason & Hoge was glad to get several contracts in Kentucky on a line being built from Cincinnati to Chattanooga by the Cincinnati Southern Railway. With these, the company gradually began to move its activities away from Virginia. While Mason would continue to reside in the Valley he would spend most of the next decade working on contracts in

Kentucky, Tennessee and Georgia. Eventually, the company headquarters would be located in Kentucky.

Following completion of the two Cincinnati Southern contracts, Mason & Hoge, feeling now the full effects of the depression, ran out of railroad work for a while. But for the decade of the 1870s they had still managed a respectable showing: some 500 miles of railroad tracks, bridges and tunnels. Mason, himself, still took an active part in managing the affairs of the company. Although now almost eighty, he still had the capacity to outwork men fifty years younger, a fact his associates did not fail to note:

> Once, I remember, [wrote one associate] he arrived at Buchanan about two o'clock in the day, expecting his horse to meet him there. He started walking to the mouth of North River, where our camp was located, arriving there about 7 o'clock in the evening tired and hungry, not having eaten since early morning. I think he must have been seventy-five years old when he made this walk. [As a fact, he was more than eighty.] I do not remember just how many miles it was but it must have been twenty-five or thirty.
>
> During this period, Mr. Mason would frequently have me up at 3 o'clock in the morning, writing numerous letters and checks, and by daylight he would mount his horse and go fifty or sixty miles off. This merely to show his indomitable will power and why he succeeded in his undertakings. He let nothing stand in his way, and in all the time I knew him I never heard of his failing in any undertaking.
>
> When we were at Lewis Tunnel, [wrote another associate] Mr. Mason had trouble with a man much younger than himself. Mr. Mason was on his horse and the other man on the ground. As a climax to the row, the man said that if Mr. Mason were not so old and gray headed he would do thus and so to him. Mr. Mason jumped from his horse and said, 'Consider every hair of my head as black as a crow, Sir!'

His other abilities appeared undiminished also, and a ride along a line of survey was all he needed to estimate the materials and work required, how many men would be required and how long it would take, as well as what the total cost would be. Thus, his contracting activities continued apace, with the extension of the Elizabethtown, Lexington, and Big Sandy Railroad from Ashland to Mount Sterling for the C&O in 1880 and the tunnels and part of the roadbed on the South Pennsylvania beginning in 1883. Strangely enough, these tunnels on the South Pennsylvania were not then completed for the railroad itself was abandoned. Years later the line of the railroad became the Pennsylvania Turnpike right-of-way and Mason & Hanger, as the Mason company was by then known, completed them as highway tunnels.

By 1905, a C&O directory listing of railroad contractors would be studded with the names of men who had gotten their start with Mason's firm. Beyond that, Mason's company would continue to prosper; the tunnel expertise and reputation gained building railroads prepared it for tunnels in New York and Boston, the Chicago Drainage Canal, Grand Coulee Dam, Radford Arsenal (and others) and, finally, its translation in the mid-twentieth century from a construction company to a company operating these arsenals and nuclear weapons facilities for the U.S. Government.

But by the time the South Pennsylvania was abandoned, Claibourne Rice Mason's long and busy life had drawn to a close. It was January 1885 and Dr. Hunter McGuire, Mason's old

compatriot and the man who had amputated Stonewall Jackson's arm, was in attendance at his bedside at Swoope's Station. "Captain," said Dr. McGuire, "could you build a bridge tonight?" Mason made no reply and McGuire walked out of the room saying, "Captain Mason is now bridging his last river!" As Alex Street, a former slave, who had grown old in the employment of Mason and his company put it: "The Lord don't make men like Cap'n Mason in these days. He takes that much material and makes five and sometimes ten men out'n it."

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The Materials of History

Howard H. Newlon, Jr.

["Backsights" No. 82: originally published in the *Bulletin,* November 1982]

The reference materials from which most of the "Backsights" articles have been prepared over the past ten years have been in the form of handwritten and printed documents. Such documents are obviously the major source of information for historians. Books, government documents, diaries and manuscripts are all highly treasured sources. Any written document, however, reflects the bias of the author regardless of the effort made toward objectivity. Books contain a large amount of specific information, but are perhaps the most biased because of the author's need to select from the voluminous original materials and documents, and then distill the material he has selected still further.

Government documents and official reports often contain only the materials that reflect the best accomplishments of the authors or the most dire needs of the moment. Original manuscripts and letters, while rare and subject to many of the biases found in published documents, are very important sources, particularly when the letters are informal and reflect the personal views of the writers about specific subjects at particular times in history.

Today we live in an age of paper where information is produced in such quantities that no one really has time to absorb or synthesize it anymore, and where files are periodically purged to make room for still more. Much information of the type that formerly was transmitted in letters is now exchanged in telephone conversations and increasingly through other electronic means thus terminating the creation of significant primary sources for future historians. Attempts to record informal conversations for subsequent reference are obviously fraught with potential for abuse and in many cases are now prohibited by law.

In recent years, considerable efforts have been directed toward collecting oral histories from people, not only those in highly visible positions and occupations, but also those with long experience in various trades and crafts who remember "how it used to be" before extensive mechanization. A leader in developing these oral histories has been the American Society of Civil Engineers, which in cooperation with the Smithsonian Institution has for a number of years been recording tape and video interviews with people in many engineering and construction professions. Similar projects are being conducted by other groups.

Also in recent years, there has been an increasing appreciation of photographs and pictures as primary sources of information. We often think of pictures as only a means of illustrating or supplementing the written word. But an old photograph often contains, in addition to its main object, common or incidental details that at the time seemed unimportant but which have now themselves become the object of study. A photograph or drawing of a Civil War battlefield can be used to locate nineteenth century road traces, or it may be the only recording of a small bridge. A box of miscellaneous photographs that survived various "clean-outs" in the Department's bridge division after they were taken in the 1930s with a simple box camera,

proved invaluable to the Research Council during its study to document bridges with potentially historic significance. Old photographs have been particularly useful in the restorations of historic buildings.

Because of the long exposure times required with the equipment and film used in the early days of photography, portraits and stationary objects were given primary attention. Fortunately, these stationary objects included many roads, bridges and vehicles significant in the history of transportation.

In some cases the photographer was aware that he was recording a historic event, such as the driving of the golden spike on May 10, 1869, that marked completion of the transcontinental railroad at Promontory Point, Utah. But more often the historic significance is not obvious at the time, as was the case when, say, the last photograph was made of Robert E. Lee.

Often sources originally numerous become rare, in part because of their commonness. An example is the nineteenth century metal truss bridge catalogs that were produced in quantity for distribution to local bridge commissioners, but later were thrown away much as we today discard advertisements. Very few catalogs have survived, but those that are found provide important insights into the technology and processes by which the structures depicted were authorized and built.

The common picture postcard often provides the only view of a downtown street scene or of a particular building or location. Several years ago I found in the attic of my wife's home a postcard mailed from Cincinnati in 1907 and bearing a photograph of the then recently completed Ingalls Building, the world's first concrete skyscraper.

Many common items such as postcards were not saved because they were not supposed to be. The same will be true of other modern sources. Significantly, in October of this year, a group of librarians and archivists from throughout the world met at the University of Virginia for a daylong conference on Polish Solidarity Materials. Their purpose was to discuss the problems of preserving materials outlawed in Poland but smuggled into Western nations. Recognizing that many of these items are mimeographed newsletters, pamphlets, cartoons, etc., printed on papers with very little durability, but that they will provide future historians with important material against which to balance the official state documents and newspapers, these archivists are acting now to ensure their survival.

Prior to the development of photography, the only pictures available were sketches and paintings such as the accompanying illustration by the French painter Claude-Joseph Vernet (1714-1789). It is reputed to be the only known artistic painting of street or road works from the time of the French Revolution. The artist titled it "Construction of a great road in a mountainous country." It was done in oil on canvas (87 x 162 cm) and today hangs in the Louvre.

A reproduction hangs behind my desk at the Research Council where daily it reminds me that I am part of a long tradition. For those interested in technology, it provides valuable information on how the eighteenth century roads and bridges were built. One can see locally available stone being progressively reduced in size as construction proceeds along the grade.

The crane and derricks on the bridge, along with the forms, provide insights into the bridge-building process. Shaping installation and tamping of the roadway are also illustrated.

[*Image in original:* The mentioned painting by Vernet. *Caption: Construction of a great road in a mountainous country*, by French artist Claude-Joseph Vernet.]

But in a somewhat lighter vein, anyone associated with the modern road-building process can speculate on other, more subtle aspects of the scene.

On the first horse is the famous engineer, J. R. Perronet. One supposes that the project engineer with hat in hand is either expounding upon how well the job is going, or else is trying to explain why it is not being done in strict conformance with Perronet's plans and specifications. The three horsemen in the foreground have blue coats, perhaps identifying them as "state people." The horseman in the background, dressed in green, is perhaps the eighteenth century equivalent of today's FHWA area engineer. The blue-coated leaning horseman is very interested in the stones being loaded on the wheelbarrow. Perhaps he's from the materials division.

Women were a part of the construction process, but served in the traditional roles of bringing food to the workers. They seem to be waiting, perhaps because inspectors and visitors always seem to come at lunchtime.

On a more serious note, the post upon which the woman is leaning designates it as "250," probably marking 250 kilometers from Paris. This would help modern scholars to establish the location. The post also carries the "fleur-de-lis," an equivalent of the Seal of the Commonwealth.

Environmentalists would probably be concerned about the dumping of waste materials into the river without appropriate straw bales or silt fences, and the tree hanging over the opposite bank doesn't seem to have been properly protected during construction.

On the hill stands a windmill, the ancient source of energy that today is receiving renewed attention. Along the edge of the completed section is the stone wall, forerunner of today's guardrail. All of our modern concerns seem to be pictured. Truly, the more things change, the more they stay the same.

This picture not only provides information on the technology of eighteenth century road building, but also reminds us of our long heritage in providing roads and bridges vital to the needs of our citizens. Vernet left what appears to be the only known illustration of this common but important activity during this period. Perhaps buried within boxes stored in attics or other out of the way places will be found photographs, bridge catalogs and other items that will contribute to the understanding of our profession.

Elegance Reborn: The Orient Express

Nathaniel Mason Pawlett

["Backsights" No. 83: originally published in the *Bulletin,* December 1982]

Each generation seems to want to define elegance in the terms used by the preceding one which they can vaguely, and nostalgically, remember. For one man it may be the 1941 Lincoln Continental, for another the 1924 Chrysler dual-cowl phaeton (chauffeur-driven, of course) that personifies the age. For others, it may be just a year that they think of: 1939, 1914, 1861 or even 1775. For still others, it may be a ship such as the first *Queen Elizabeth* or the *Lusitania,* a hotel like the Ritz or Claridge's, or a train like the *Twentieth Century Limited.*

While all of these recollections are strongly flavoured by nostalgia, there is also a strong element of truth in each of them. And perhaps the most instantly recognizable symbol of elegance, as well as mystery and intrigue, is the *Orient Express.* Recently reborn in a refurbished form, it will perhaps be the precursor of similar revivals in the United States and elsewhere in the years ahead.

[*Image in original:* Poster advertising the Orient Express. *No caption*.]

If the *Orient Express* is well known as a symbol of elegance, its significance as a symbol of American innovation and the transfer of our technology to Europe is virtually unknown. The original idea for it came from a young Belgian engineer, George Nagelmackers, who visited America in 1865. There he saw and was greatly impressed by the luxurious sleeping cars of George Pullman. Since American tracks were then much rougher than European ones, coaches here were mounted on four wheel trucks or bogies at each end to produce an articulated system with a much better ride. For a still more comfortable ride, Pullman had mounted his coaches on the trucks with rubber mounts. Talk was also rife of a transcontinental railroad being completed shortly, and Nagelmackers heard of George Westinghouse's air brake, then undergoing development.

Returning to Liege, he began to pursue his dream of a long-distance train, running all the way to Istanbul and with the alluring magical name of "The Orient Express." The fact that Nagelmackers's father was a banker and King Leopold II of Belgium a spendthrift greatly helped the chances of the scheme: The king received overdraught privileges and in return became a patron of the railway project, the royal name helping to smooth the negotiations with the seven independent railway networks through which the train would have to run.

Finally, on October 4, 1883, Nagelmackers's "Compagnie Internationale des Wagons-Lits" had its first train leave the Strasbourg station bound, via Vienna and Budapest, for Giurgiu in Rumania. From here passengers crossed the Danube by boat to take another train to Vienna, and a steamer from there to Istanbul since no rail link yet existed through Bulgaria. Two sleeping coaches and one diner made up the passenger portion of the train, but they were matched (unusual at that time) and, most innovative of all, each was mounted on two four-

wheeled trucks to give a much smoother ride. Mail travelled behind the tender and luggage and the "kitchen" in a separate luggage van.

Much publicity accompanied this first trip. Nagelmackers had seen to that, and on the Grand Inaugural were some two dozen celebrities among whom were strategically located the well-known French author Edmond About, and the Paris correspondent for *The Times*, Henri Stefan Opper de Blowitz. Naturally, both wrote accounts of the trip, which did nothing to hurt business either. And so the *Orient Express* was launched!

It was the turn of the century, however, before a completely overland route existed, linking Paris via Belgrade, Nische and Sofia to Istanbul. A 68-hour journey and three nights on the train were required to make the trip. With the completion in 1906 of the Simplon Tunnel under the Alps a southern route opened up, and by 1912 the busy Paris to Venice run was extended to Trieste, necessitating a second bore at Simplon. The war interrupted the tunneling, however, and it was 1921 before the *Simplon Orient Express* came into its own, reaching past Trieste via Zagreb, Vincovici and Belgrade to Istanbul.

The *Orient Express's* aura of luxury and prestige soon attracted the royal, the aristocratic, and the merely rich, as well as both the famous and the infamous travelling to Venice and the East. Although perhaps ninety-nine percent of the passengers were ordinary (but well-heeled) travellers in search of such things as vacations and Persian Gulf oil, or else officials on their way to take up posts in Cyprus or Palestine, the one percent consisting of politicians, spies, arms merchants and mysterious women gave the train its image in the popular mind. In only a short time, stories and legends surrounded it. Authors like Graham Greene (*Stambould Train*, 1932) wrote about it, as did the authoress Agatha Christie *(Murder on the Orient Express*, 1934, originally titled *Murder in the Calais Coach).* Both had their books turned into movies, but Alfred Hitchcock's *The Lady Vanishes* (1938) is perhaps the archetype of the Orient Express films although the name of the train goes unmentioned throughout the film.

Among the real-life spies who graced the train's coaches at one time or another were the notorious female spy, Mata Hari, and Baden Powell, more noted as the founder of the Boy Scouts, but a British spy observing Turkish naval installations before World War I. Dozens of Europe's crowned heads used the train regularly in the days between the wars, but by 1945 the heyday of this highly civilised mode of travel which the best trains represented was over. Both spies and aristocrats, as well as the occasional "mysterious woman," travelled by air now. By 1957 Ian Fleming, his hero James Bond gazing at the words "Orient Express," noted that the great trains were going out all over Europe "one by one." Twenty years later, the *Orient Express*, by then hardly more than a name for a group of interlinking local expresses, died. That fall of 1977 Sotheby's auctioned five of the cars, at Monte Carlo, seemingly bringing down the curtain on the first-class, long-distance train as a viable transportation medium.

Nevertheless, on May 28, 1982, a train bearing the name *Venice Simplon-Orient Express* pulled out of Victoria Station in London, inaugurating a new service. The idea of an American, James Sherwood, who bought two of the sleeping coaches at the Monte Carlo sale, the revived *Orient Express* now owns 30 more coaches which have been meticulously restored down to the smallest detail. The train journey itself occurs in two stages, London to Folkestone, by ferry

across the English Channel, then by train to Venice. The English section of the train consists of five Pullman parlour cars, two Pullman parlour/kitchen cars and a baggage car, all dating from 1925 to 1938 and done up in chocolate and cream. The French section is done up in the deep blue and white livery of the late 1920s and contains nine "luxe" class sleeping cars built in 1929. All but one were at some time part of the original *Orient Express* and each has emblazoned on its side the golden legend "Compagnie Internationale des Wagons-Lits et des Grands Express Europeens."

This painstaking attention to detail carries over into the interiors of the restaurant and sleeping cars with their immaculate art deco marquetry and coke-fed central heating stoves. The haute cuisine of the restaurant cars continues. The theme bids well to match George Nagelmackers's original offerings.

Many will, of course, choose to see all this as merely a very expensive nostalgia trip and James Sherwood as just another millionaire playboy with the largest toy train set in the Western world. Still others, the railroad preservation purists and enthusiasts, will wish to commend Sherwood for his accurate recreation of rail travel in its heyday. One writer put it this way: "We have seen the past—and it works."

But perhaps of more moment is the question of its effect on the future of railroading. Will the essentially American idea of first-class, luxurious railroad travel that was taken to Europe and brought to fruition there by George Nagelmackers now return to America as a viable concept as a result of the efforts of an American, James Sherwood, to revive the legendary *Orient Express?* Already there is emulation in the form of luxury railroad excursions here, and the revived *Orient Express* has been featured on television and in numerous magazine and newspaper articles. Will this, in the manner that the television series *The Love Boat* is said to have revived the cruise ship business, ultimately result in the revival here of that most gracious mode of travel, the long-distance luxury railroad train?

George Pullman's Wonderful Sleeping Cars

Nathaniel Mason Pawlett

["Backsights" No. 84: originally published in the *Bulletin,* January 1983]

George Mortimer Pullman (1831-1897), born into a family of ten children in Brocton, New York, was already selling farm implements by age fourteen. Indeed, his talents in life were to be, if anything, more those of the entrepreneur than the inventor. In a couple of years he was travelling around the East as a salesman of his brother's wooden cabinets and closets, honing these same talents.

A public relations genius always ready with a good story, often highly embellished, Pullman claimed that he first got the idea for his sleeping car in the winter of 1853, when he was twenty-two, while transporting his heavy samples of cabinetwork the fifty-eight miles from Westfield to Buffalo, a four-hour journey by rail. The cars in which he travelled reflected the accepted standard of the time: no heating, light from a few flickering candles, wooden seats with the wind blowing in around the ill-fitted windows. All of this must have been especially provoking to one selling cabinetwork. Arrived at Westfield, he soon forgot cabinet selling and by the end of the day he had in hand a rough design for a saloon or parlor car. His original design reflected his cabinetmaking background in its solidity and decorativeness, but gave little consideration to the fact that it would have to be a piece of railroad rolling stock.

If this was not just another of Pullman's "good stories" then not much came of it right away either, for his father died shortly, leaving him his carpentry business. Shortly, Pullman moved to Chicago, said to be the fastest growing city, with money to be made by contractors who could move buildings to allow for new urban development. There Pullman contracted to move a small hotel a short distance without disturbing either the guests or the furniture. Taking it up and placing rollers underneath, this was soon accomplished successfully with maximum publicity obtained by the simple expedient of providing lavish hospitality for the crowd of reporters he invited to watch. Unfortunately, few Chicago buildings needed to be moved and he was soon in financial difficulty.

Returning to New York, he started up his father's business again. Meeting a former New York state senator who along with his brother had a contract to run the sleeping cars on the Alton, Galena and Chicago, he was offered the job of equipping the two coaches they had bought as sleeping cars. This enterprise was short-lived however, due to passengers' objections to paying fifty cents for a sleeping accommodation on what were really fairly short journeys. The cars did ultimately prove useful for, with the coming of war in 1861, they were used to transport Union troops over long distances, fifty to the car rather than the twenty for which they were built.

Strangely enough, Pullman ran a general store in Colorado during the war, far removed from the theater of operations. Profits were handsome, and before the war ended he returned to

Chicago with about $20,000, enough to build the first real Pullman car. This took him a year with most of the work done by him, and he was almost broke when he finished it.

Named "The Pioneer," its decor became the theme of every luxury coach that came after: walnut panelling, framed mirrors, polished brass lamps and fixtures, carpeting and embroidered cloth seats. Far and away the heaviest passenger vehicle yet built, the Chicago & Alton Railroad (his prospective customer) thought it both too wide and too tall for its tunnels and bridges, besides being much too heavy for the track. Railroad after railroad refused it, and "The Pioneer" sat unused on the siding by Pullman's workshop.

Then fate played a hand. On April 15, 1865, Pullman saw in his morning newspaper that Lincoln had been shot in the head. Obviously this must prove ultimately fatal. When this occurred, the body was to be taken back to Springfield, Illinois, Lincoln's hometown. Pullman immediately grasped the opportunity before him to get his car before the public. A banker he knew, Colonel James H. Bowen, was making the arrangements for the funeral, so Pullman told him that "The Pioneer" was at his disposal, then went to see Mrs. Lincoln, who gratefully accepted his offer.

This done, the railroad could hardly refuse to provide transit facilities for the coach containing Lincoln's body. Accordingly, gangs of workmen were shortly put to work widening the tunnels and strengthening the bridges so that "The Pioneer" could traverse the route. Thousands observed the funeral train moving at a snail's pace, millions read detailed descriptions of the train and looked at drawings of the funeral car, "Pioneer," in newspapers and journals throughout the United States and the world that covered the murder and funeral.

After the funeral, the car returned to Chicago, at each depot stopping to be viewed by journalists and dignitaries. When General Grant, the victor of Appomattox, made his triumphal journey home to Galena, Illinois, Pullman had his car on the spot at Chicago and Grant accepted the offer of it. Again, the railroad had to alter the tracks over hundreds of miles in Michigan, Indiana, and Illinois. As a result of all of this, contracts for Pullman cars poured in. Pullman's sleeping car was launched!

Among the thousands who inspected "Pioneer" was George Nagelmackers, who took note of the coaches, their mountings on rubber on four-wheeled trucks. Touring his shops, Pullman told him of his many accomplishments and showed him the contracts which gave him a monopoly for running his cars over the various railroads and passing from first one company's tracks to another. Nagelmackers was particularly impressed with this through-running facility. He now had the knowledge which would enable him to bring to fruition his Orient Express project.

Publicity continued, as more people rode the cars and wrote about them for publication. By 1867 Pullman was operating forty-eight cars, when he heard of Andrew Carnegie, then superintendent of the Pittsburgh division of the Pennsylvania Railroad. Along with another man, Carnegie had formed the Central Transportation Company to try to gain the sleeping car contract of the Union Pacific, then under construction. Competition for this contract ultimately led him and Pullman to combine and form a new company, The Pullman Palace Car Company. Kings

and queens, emperors and czars were very influential in the world, said Carnegie, and every city had a 'Palace Hotel' and many palatial mansions, so the new name should prove alluring to travellers. Carnegie sold his Pullman stock in 1873.

Two problems stood in the way of Pullman's idea for "continuous long runs over different roads," the various gauges of track then in use and the necessity to stop three times a day at stations to eat. After many conferences, the various eastern railroads agreed to a standard gauge, solving the first. Pullman solved the second by developing his "hotel car" which provided beds at night and tables between the seats to eat from at mealtimes, besides a kitchen at one end and a smoking room at the other.

The year 1870 saw the first through train with Pullman cars cross the continent from the Atlantic to the Pacific in one continuous passage. The company now began to establish shops for the construction and repair of its cars at strategic locations across the country. Shortly, railroad officials from England, France and Italy began to come here to inspect and purchase the cars. All was not rosy for Pullman, however, as he had at least eight companies competing against him with whom he was often involved in litigation over his various patents. Technological development continued, operating the cars put Pullman in the business of training the personnel to man them, and the increasing demand for the cars led him to build a new plant and a town named Pullman on a 3,600-acre site fourteen miles south of Chicago. By 1893 Pullman had a town of 12,000, over 14,000 employees on his payroll and operated his cars over 125,000 miles of railway carrying 5,250,000 passengers a year, built houses, ran a bank, made brick, and turned out ordinary freight and passenger cars in addition to his sleeping and dining cars, besides engaging in a host of other enterprises.

George Mortimer Pullman died of a heart attack on October 19, 1897, at the age of 66, but his company, then valued at $36,000,000, lived on. Two years later, the Wagner Palace Car Company, his principal competitor, was absorbed and "The Pullman Palace Car Company" became simply "The Pullman Company." In 1910 it constructed its last car of wood; henceforth they would be all steel. Corporate change and the acquisition of competing companies continued apace. The first aluminum lightweight sleeping car was exhibited at the Century of Progress in 1933 and the next year cars began to be air-conditioned. By 1935 some 6,000 had been equipped with it. With these developments came the most modern in plumbing, heating, lighting, roller bearings, foam rubber mattresses and seats, shatterproof glass, tight-lock couplers and electrodynamic brakes.

With the 1940 antitrust suit by the federal government, major changes came to Pullman. The parent corporation was forced to divest itself of the sleeping car operations, but fifty-nine of the major railroads purchased it in the interests of continuing the excellent Pullman service over the 104,000 miles of track then under contract.

Indeed, Pullman had revolutionized travel accommodation in the nineteenth century. In the twentieth century, America continued to progress by virtue of the fact that people could sleep while travelling across the country, arriving at their destinations refreshed and ready for a day of work or play.

River of No Return, Part I

Nathaniel Mason Pawlett

["Backsights" No. 85a: originally published in the *Bulletin,* February 1983]

In memory of
FRANK PADGET
a coloured slave, who,
during a freshet
in James' River, in
January 1854, ven-
tured and lost his
life, by drowning, in
the noble effort to
save some of his fellow
Creature's
who
were in the midst of
the flood, from death.

This inscription is found on a monument located beside the old James River and Kanawha Canal, now the C&O railroad, in the gorge where the James River passes through the Blue Ridge. Those who have seen the James River in raging flood will be better able to appreciate the gallantry involved.

> [*Image in original:* Photograph of the James River at Glasgow, in flood. *Caption:* The normally tame James River can become a raging, dangerous killer when it floods. Under all of this water lies the intersection of Routes 501 and 130 in Glasgow in Rockbridge County, photographed in the wake of Hurricane Camille.]

Frank Padget was the subject of a Virginia Cavalcade *article (Vol. II, No. 3) many years ago, drawn principally from a letter published in the* Lexington Gazette *of January 26, 1854. This contemporary account of the events by Captain Edward Echols, who later erected the monument to Padget, was reprinted by the Virginia Canals & Navigations Society in its newsletter,* The Tiller, *in December 1982. It is a classic piece of Virginiana with its hero, the slave Frank Padget, deserving of a place in Virginia's pantheon of heroes. Without further comment, except to say that the writer was well-nigh inspired, we present this "cracking-good" adventure story.*

> Canal Boat Lost in the Mountain! Mouth of North River, Saturday, January 21.
>
> Mr. Editor: We have just passed through a day of the most thrilling and awfully melancholy scenes and adventures that it has ever been my lot to witness. For several days our water courses have been quite fresh, and the heavy rain of last night raised North River several feet higher than it was the evening previous. This morning the Canal boat Clinton, Capt. Wood, having on board some 34 negro hands, and several white hands who were on their way to the Central Railroad to work for Messrs. Coleman, Morris, & Co., besides four or five young gentlemen, and the boat

hands (five in number) attempted to pass on up the river to Buchanan. Just after passing the North River Bridge, the tow-line broke, and the boat, drifted at the mercy of the water down James River, towards the Mountain dam—the water being too deep to touch bottom with poles—about 100 yards before she reached the dam at the Cement Kilns, seven persons jumped off, and attempted to swim ashore, four reached the shore safely, viz: a Mr. Sydney Royal, E. Hugg, and two of the boat hands. Three went over the dam and perished, viz: a Mr. Paine, from Fredericksburg and two negro men. The Captain of the Boat held the tiller and called to those on the bank to enquire what he had best do. He was told to straighten up his boat and let her run, but to stick to her. He therefore, exerted himself manfully, succeeded in getting down her stern to prevent her from going over broadside, and over she went, riding the waves like a thing of life, no lives were lost in this leap, but now came the awful crisis, viz: to run through the White Rock, the Little Balcony, the Great Balcony falls, and the Tobacco Hills, places that formerly made the boldest hearts quake, and the strongest nerves give way under favorable circumstances, now the scene became most thrillingly exciting to observe the boat crowded with human beings, hurried on as it were, by the boiling waters with the speed of a race horse, down the river, as we all supposed, into the very jaws of destruction. On she speeded, and as she passed within a foot of the White Rock, which, if she had struck, she must have gone to pieces—the Captain and four or five persons jumped from her on the rock and there they were out in the middle of James River, on a naked rock, the raging waters roaring around them—on went the boat—the "Little Bell" and "Big Bell" just below in one or the other of which we all thought she must inevitably go to pieces, but a kind "Providence," determined to have a hand in the matter and contrary to all calculation she missed every rock until she reached the head of the Tobacco Hills where she hung lightly on a rock in the middle of the river. Then came the question can these people be saved, then came the response "we'll try" and off some of us dashed to get a batteau, and some skilful watermen who were willing to peril their lives in the humane effort. A boat was obtained, some hands were collected who dragged the boat over the towpath, and launched her in James River below the Cement Kilns. No time was to be lost, the river was still rising, and the wind by this time was blowing a perfect hurricane through the gap of the mountain, making the adventure next thing to madness. But the question was propounded "Boys who will go?" when out stepped some half dozen or more brave hearts, among them, an old boatman, a headman named Frank Padget, upon whose skill we felt rested our main dependance to rescue those who were in such imminent peril. Frank was requested to take the head of the boat, and select such men as he wanted to man and manage her. This he did with the accurate judgment usual with such men in such matters. He said he wanted but two assistants, and selected Sam and Bob, two negros, out of a half dozen others. A Mr. Wm. Matthews, and a Mr. McCollogan, two gentlemen in the employ of the Jas. River & Kanawha Company, volunteered to go along and assist also. These five jumped aboard, pushed out from shore, and pulled manfully for the opposite shore, to get into a current that would take them near the White Rock. They had scarcely reached midway the stream when a heavy squall struck the boat, and drove them back to the same shore they started from.

(To be concluded next month)

River of No Return, Part II

Nathaniel Mason Pawlett

["Backsights" No. 85b: originally published in the *Bulletin*, March 1983]

(The slave, Frank Padget, having taken command of the boat, the valiant attempt to rescue the people from the raging James River continues.)

Their brave resolve was not to be shaken by this catspaw, so up the river they towed, and out they again shot into the angry stream, and on they flew towards the White Rock, they approached it, Frank is heard to give some direction, the men got ready, a tow-line is thrown to the men on the Rock who caught and clung to it with all their energy. Frank skilfully shoots the head of his boat into the eddy under the Rock.—He is heard to call out "down with your stern" and the boat comes up beautifully to the Rock just below. Hurah they are saved, and the welkin rung again with a shout from shore. But half their work was not done, to take them aboard, to pull across and land the poor fellows took less time than it takes to write it. Then to make a few more preparations, to cut out and fly down stream through the fearful Balcony gorge to the rescue of the rest was the work of a few minutes only.—While engaged in saving these above, the water had risen enough to start the Canal boat off again, and away she went headlong through the Tobacco Hills, and hung just below in the small timber of a small island then mostly covered with water. On her passage one of the negroes on board had jumped off on a flat rock near the velvet rock and as we passed there he stood without his coat, wet with spray and shivering in the cold, imploring help, but the boat could not then be gotten to him, and it flew to the assistance of those who remained still on the Canal boat. Many persons on shore were affected to tears as they witnessed the scene at this moment. The Canal boat was reached in safety and all hands taken off and safely brought to shore. None but those who were present can imagine what feelings of relief were experienced at that moment.

Then it was asked, "Frank can the poor man on the rock be saved." He replied, "Yes sir, I think so." "Then let us lose no time." The boat was gotten in the Canal at the rope ferry, and towed back above the falls, and pulled again over the tow-path. The same noble fellows who had already been through, again volunteered, and two others, one a white man, and one negro consented also to go.—The situation of the rock was dangerous in the highest degree. Away they fly, the man on the rock is motioned to, to jump into the boat, as she passes by, which he understands. He fixes himself so as to jump, the boat arrives, he jumps into her, we all on shore fix our mouths for a shout, but Oh God! Horror of horrors! the boat has struck. Her stern swings around, the water washes over the upper gunnel, and in the twinkling of an eye she is wrapped around the rock, crushed like an eggshell. Five of these on board have just time to leap upon the rock. Three are in the water, the brave Frank, the courageous Bob and the poor man whom they had gone to rescue. Bob clung to the stern oar and drifted ashore on the opposite side, Frank struggled manfully, for a minute, and went down to rise no more, with the poor creature he was trying to save. No one can describe the feelings which we all experienced at that moment. But now there were five brave hearts on that rock to save, and no time to be lost for night was approaching. The water was sloshing over the rock and covering them with spray. The weather freezing. To send off for another old headman, to ride home and send another messenger for the waterman, to get another batteau and collect together hands to throw her over the tow-path, occupied but a few minutes. We reached the proper place, pulled the boat out, and were just starting her over the bank when awful to tell, the negro let her get away, and she went out, with all our efforts to prevent—beyond our reach in the river, and broke to pieces below on the rocks. Providence may have had a hand in this to prevent a further loss of life, for it was now fully dark, and seemed madness to trust oneself out in such a wind on such water, but we would have done it if we could have gotten a boat, as we had no other at hand we are forced to wait until morning, having the belief forced upon us that the

brave unfortunates now on that rock would be frozen before midnight, while I am now writing, at 11 o'clock at night, they may be in the embrace of death.

Sunday.—Having sent and obtained another boat last night, we collected all the hands we could, and by daylight commenced work, and got her launched in the river below the dam. Placed the old mountain ferryman, Sam Evans, in command of her, and sent with him six volunteers. The river had risen some in the night, yet we were informed, contrary to our expectation, that the men were alive and still on the rock. Soon the boat was prepared and the skilful waterman shot her out into the stream. On she sped until they got below Balcony falls, where they hugged the bank on the Bedford side, and stopped up to make observations. They then shoved out to a large rock near the middle of the river, and upon it fixed an anchor of pigmetal to which they tied a long towline that had been procured for the purpose. The boat was then cautiously dropped through the awful gulph below the rock on which the devoted men stood. The hands endeavored to pull up to it, but could not, and we all thought she must inevitably swamp in the heavy water, what anxiety was then felt by those on the rock as well as those on shore. But no, Sam Evans take up a long poll, braces himself, gets a hold and on moves the boat, then a line was thrown to those on the rock, the next moment, up she goes, the half dozen men were lifted on board, the line was cut and away they flew like an arrow, safe and secure. No pen can describe the feelings experienced at this moment. The Hills echoed again with the loud long shout given by a hundred mouths. The five poor fellows will all escape with their lives, though several will be badly frost-bitten. Heaven grant we may not have any more such scenes.

[NOTE: In 1997, the monument to the heroic Frank Padget was moved from its original site at Lock 16 of the canal to a more prominent location, in Centennial Park in the town of Glasgow in Rockbridge County. A Virginia historical marker commemorating Padget has also been erected nearby. January 21, the anniversary of the tragedy, is now designated "Frank Padget Day" in Glasgow.]

The Three Notch'd Road Revisited

Nathaniel Mason Pawlett

["Backsights" No. 86: originally published in the *Bulletin,* April 1983]

An earlier article in this series ("The Three Notch'd Road," January-February 1976) attempted to sketch briefly what was then known about the history of the Three Notch'd or Three Chopt Road, from the 1730s to the 1930s the predecessor of Routes 250 and 64. Further research and reflection upon this new data make another article seem worthwhile.

Traditionally an Indian path improved by sections during the 1730s into a road suitable for wheeled vehicles to travel from Richmond to the Valley, the road was originally called the Mountain Road or Mountain Ridge Road. By 1737, it had a system of numbered mile markers running from west to east. These were probably erected by Peter Jefferson to divide the road into segments for individual road surveyors and were probably painted or incised on trees. It seems likely that No. 0 was at the D.S. Tree near the present Ivy, a tree on which were carved the initials of an early settler named Davis Stockton. No. 12, "the twelve mile tree," was located near Shadwell, while Nos. 18, 22, 26, 30, 32, 36, 40, and 46 ran on down to near Richmond. William Byrd described a similar system of numbered trees in Spotsylvania County in 1732.

During the 1730s, the name Mountain Road occurred regularly in the Goochland County records, but beginning about 1742, the names "three notch," "three notched," or "three notch'd road" began to occur in the county records, with an occasional "three chopped" or "three chopt." Of the first ten occurrences, eight or nine were one of the forms of "three notch'd." The name Mountain Road rapidly fell from favor after 1743, although as late as 1755 an advertisement in the *Virginia Gazette* called it the "Three Notched mountain road." The road's part in the historic events of 1781, Colonel Banastre Tarleton's Raid and Jack Jouett's Ride, is well known. To the foregoing it now seems some additions can be made.

The first occurrence of the name "Three-notched Road" seems to have been in a Louisa County ordinary license of February 14, 1742 Old Style, and the second in the renewal of that license a year later. Eleven days after this renewal the name began to appear regularly in the records of Goochland County, the county in which almost the whole length of the road was then maintained.

The question of the origin of this name has never been fully resolved. That it came from the notches placed at intervals on trees along the road is obvious. But why were the notches placed there? Why only in 1742, if the numbers up to 46 already existed on the trees by 1737? The close coincidence of the first occurrence of the name (February 14, 1742 O.S.) and the formation of both Fredericksville Parish and Louisa County (both of December 1, 1742 O.S.) suggests some relationship may exist between them.

The first use of the term "Three-notched Road" occurred in a 1742 license for this ordinary at Gum Spring (photographed in the 1970s).

The road running in 1742 along the top of the watershed between the James-Rivanna rivers and the Pamunkey-South Anna rivers, then known as the Mountain or Mountain Ridge Road, perhaps to differentiate it from the Old Mountain Road running parallel to it several miles to the north, was generally the boundary between the counties of Goochland and Hanover, from which Louisa was formed, as far westward as Mechunk Creek. From that point, a line ran northwestward to the Blue Ridge, crossing the mouth of Ivy Creek, and delineated the extent of Louisa as created in 1742, if not in fact the earlier Hanover County. While the county line at this point seems to have left the road, the boundary of the new Fredericksville Parish diverged, following the road to Wood's Gap (now Jarman's) in the Blue Ridge. It seems very likely, then, that the line along this road was either selected and marked by the Fredericksville Parish Vestry as the parish line or that it was marked as the county surveyor at the behest of the gentlemen justices of the Louisa County Court, or perhaps both.

The simple system of marking property lines with three notches, which survives to this day, would of course have been well known to both the vestrymen and the justices. That none of the road west of the Rivanna River seems to have been denominated "Three notch'd" in county records prior to 1748 would seem to argue for the county line interpretation, although both parish and county lines would have been the same to the neighborhood of Mechunk Creek. None of the foregoing can as yet be substantiated, but it is known that an agreement to run the line to the mountains was effected between Goochland and Hanover in 1731. Whether anything was then done is uncertain, but the creation of Louisa from Hanover in 1742 should certainly have resulted in action. Presumably, the name would have appeared earlier had the road been marked with the notches earlier.

When one examines the ordinary license, some other interesting facts begin to emerge:

February 14, 1742 O.S. Louisa County Court Order Book, Page 11
On the petition of Charles Allen License is granted him to keep an Ordinary on the Three-notched Road in this County he with Thomas Paulett his security having first entred into Bond therefore and acknowledged the same

Charles Allen's ordinary or tavern would appear to be the building still standing in Gum Spring at the intersection of Routes 522 and 643 (Three Notch'd Road). Allen patented this land in 1745 and sold it in 1746, but was probably already resident on it in 1742. By 1742, also, the road would have clearly emerged as a main east-west link between the Valley and Richmond and Williamsburg, the capital.

More significant for our argument perhaps is Allen's security, Thomas Paulett, and his relationship with the parish and county government. Active in the area from 1731 until his death in 1771, he served as vestryman of Fredericksville Parish from its creation in 1742 to its division in 1761 and thence in its successor, Trinity Parish. A gentleman justice from 1748, he was sheriff in 1761 and then stood down. Significantly, he seems to have been a sitting vestryman in St. Martin's Parish when Fredericksville Parish was separated from it. Since eleven new vestrymen were elected and his is the first name in the book, he would have been the first vestryman in the new parish. Being already sworn, he would seem to have administered the oaths of office to the new men. As the only vestryman carried forward from St. Martin's, he may even have participated in marking off the boundaries of the new Fredericksville Parish.

With his probable connection to the notching of the trees as a part of the marking of the parish and/or county boundary established, why then was the term "Three-notched Road" used in the ordinary license rather than "Mountain Road," the term used for it at the time in Goochland County where it was maintained? Probably in order to clearly differentiate it from the Old Mountain Road, so called even today, which paralleled it, running between it and the South Anna River from the lower counties up to the Southwest Mountains. This was a Louisa County road and the term "Three-notched Road" may have seemed the easiest way to show clearly the location of Allen's ordinary. Either Allen or Paulett may have suggested it, or some member of the court. The name may even have already had some usage, although the fact that it only begins to be used regularly in Goochland a year later would seem to argue against this.

Whatever may have been the circumstances of its use in the license, all the evidence would now seem to begin to point to the name Three Notch'd Road as having a Louisa County origin in its first usages, as well as the name itself being an outgrowth of the laying out of that county and its more or less coincident parish, Fredericksville, in 1742.

Bicycles, Trains, and Good Roads

Howard H. Newlon, Jr.

["Backsights" No. 87: originally published in the *Bulletin,* May 1983]

Public recognition of the need for adequate funding of public works and its support of such funding are essential. In recent months, considerable attention has been focused on the nation's deteriorating infrastructure and the sizeable cost for its repair. The problem is not that the public opposes good roads, convenient transportation, or safe drinking water, but rather that these necessities have come to be taken for granted since they have generally been available and improving for a generation.

In the early part of the twentieth century, what the public took for granted were bad roads that were seas of dust during dry periods and seas of mud during periods of rain. Typical of these conditions is the description in the 1914 Official AAA Blue Book of what is now U.S. Route 1:

> A short, but miserable way connecting the two Capitals, following what is known as the Old Telegraph Road. Some short stretches of macadam and improved road; balance poor-to-bad dirt, dangerous in many places. Numerous fords, none of them big or difficult. Should positively never be attempted in wet weather.

Throughout the last half of the nineteenth century the railroad ruled supreme as the nation's transporter of goods and people during a period that has been described as "the dark ages of America's roads." Many of the nation's turnpikes, and particularly those in Virginia, had been severely damaged and neglected during the Civil War. After the war, funds were simply not available to repair the ravages of war or damages from the great floods of 1870 and 1877.

Strangely enough, the movement for good roads received its initial impetus from what today might seem two unlikely sources: bicyclists and the railroads.

The crank driven velocipede, the prototype of the modern bicycle, was introduced in France during the early nineteenth century and improved in France and England over a period of 50 years, coming suddenly into vogue in America in 1869. The *Brooklyn Eagle* observed "whole streets will no doubt in due time be modified to meet the requirements of the coming vehicle." The celebrated New England clergyman, Henry Ward Beecher, thrilled lecture audiences in 1869 with the prediction that "he would not be at all surprised to see, in a short time hence, a thousand velocipedists wheeling their machines to Plymouth Church." Influenced by the financial panic of 1873 and the unwieldiness of the 115 pound, metal-tired "boneshaker," as it had come to be known, the velocipede craze in America collapsed as suddenly as it had arisen.

But in 1872, the "ordinary" bicycle, with its large energy-saving front wheel, was patented in England and made its appearance in America at the Centennial Exposition in 1876. The first bicycles of the ordinary type weighed 70 pounds and sold for $313. They were much in

evidence on Pennsylvania Avenue in Washington during the 1884 meeting of the League of American Wheelmen.

While the ordinary bicycle required less effort to operate and rode smoother than its boneshaking predecessor, its riders often took "headers" over the handlebars and sustained fractured skulls and bruised bodies. The son of an English minister, Harry Lawson, in 1876 received a patent on his rear-wheel-driven "safety" bicycle with a lowered front wheel. In 1888, Dr. John Boyd Dunlop, an Irish veterinarian, patented his pneumatic tire, perhaps the most important innovation in the bicycle development. By 1890, the pneumatic-tired safety bicycle had replaced the ordinary bicycle, which had by then achieved great popularity, largely in the nation's cities.

By the 1890s, the streets in America's larger cities had been significantly improved structurally for the movement of goods, such as coal, and the output of America's industrial revolution. For example, in New York City, Broadway was surfaced with blocks of granite 10 inches thick laid in a six-inch concrete base, and in Philadelphia important streets were made of eight-inch stone cubes laid on beds of gravel 15 inches deep. Asphalt paving had first been used in New York and a Philadelphia in 1871 and immediately became popular because of its smoothness, silence, and ease of cleaning. By 1897, over 27 million square yards of asphalt had been laid in American cities. Concentrated populations, trade, and industry had provided a fruitful base for property taxes and special assessments so that about two-thirds of the street mileage in cities of 30,000 or more population had some form of all-weather surface by the beginning of the twentieth century.

With the introduction of the safety bicycle, almost overnight cycling became a national craze. According to one observer, "A frenzy seized upon the people and men and women of all stations were riding wheels; ardent cyclists were found in every city, village and hamlet."

These cyclists were not content to do their riding on the relatively smooth city streets but fanned out into the countryside, competing for rights-of-way with horse-drawn vehicles. It was at this point that they were confronted by the miserable country roads, where they often felt the ridicule of the farmers and rural residents who were amused at the plight of the "city slicker" cyclists caught in a thundershower on a hilly dirt road.

[*Image in original:* Print showing bicyclists behind a farm wagon. *Caption:* Bicyclists riding their new, quick two wheeled vehicles on county roads often grew impatient with slower-moving horsedrawn farm carts, leading to confrontations with farmers and other rural residents.]

The League of American Wheelmen, which had been organized in 1880 by consolidating local bicycle clubs, gradually transformed itself into a powerful propaganda and pressure group, freely utilizing newspaper space, publishing "good roads" pamphlets and, in 1892, launching under the editorship of I. B. Potter, a New York civil engineer, a magazine entitled *Good Roads.*

Even though improvement of the roads was recognized as desirable, the question remained as to who would bear the cost. Most roads were under local control and it was difficult

to convince state legislators that the localities should not bear the financial load. But during the 1890s, administrative organization and legislation began to evolve that would culminate, during the early part of the twentieth century, in state and federal aid for roads.

Among the important developments during the last decade of the nineteenth century were (1) the formation in Mississippi of a "Good Roads Association" in 1891, followed by similar organizations in other states; (2) a national road conference, the first of its kind, held in 1894 with representatives from eleven states; (3) passage by the New Jersey Legislature of a state aid bill on April 14, 1891; (4) creation in Massachusetts and New Jersey of state highway commissions; and (5) creation in 1893, within the U.S. Department of Agriculture, of the Office of Road Inquiry with General Roy Stone as special agent and engineer for road inquiry. The ORI subsequently evolved to be the Bureau of Public Roads. The creation of state aid legislation in New Jersey was greatly aided by a count study conducted by the New Jersey Road Improvement Association which proved that the traffic on New Jersey's main roads was intercounty rather than local. This study suggested that in fairness, the state should shoulder part of the burden of building and maintaining these roads, a position supported by the Association and the League of American Wheelmen that persuaded the New Jersey Legislature to act.

Momentum was building for good roads, and the financial and organizational questions were being addressed at the state and federal levels. The railroads saw road improvements as providing better access to the railroads and cooperated in this promotion of road improvements in a variety of ways. Previous "Backsights" have discussed the early projects initiated during the first year of the Virginia Highway Commission's operation in 1906, two of which ran respectively from the Chesapeake and Ohio's depot in Williamsburg to Jamestown and from the railroad station in Norfolk to the Exposition Grounds. For a considerable period the railroad transported—without cost—road material, road machinery, and the convict work force. This support of roads was a continuation of promotional efforts designated as "Good Roads Trains" that will be the subject of next month's "Backsights."

Good Roads, Railroads, and Virginians

Howard H. Newlon, Jr.

["Backsights" No. 88: originally published in the *Bulletin,* June 1983]

The previous "Backsights" described the beginning of the campaign for road improvements that occurred during the last decade of the nineteenth century and for which significant impetus was provided by the League of American Wheelmen, particularly through its magazine entitled *Good Roads,* first published in 1892. State legislation quickly followed these early efforts in New Jersey and Massachusetts, and in 1893 the Office of Road Inquiry, later the Bureau of Public Roads, was established within the U.S. Department of Agriculture.

From the inception of the good roads movement the need for strong local support was recognized. In 1893 there was only one national and three or four local good roads associations in the United States. Eight years later over 100 organizations, including six distinctly national associations, were promoting good roads. Initially, the most aggressive was the National Good Roads Association (NGRA) that was formed during the Chicago Good Roads Convention of 1900 and was headed by Colonel William H. Moore of St. Louis. Col. Moore was a persuasive promoter and in 1901 he conceived the idea of a traveling good roads show that would cover the country, educating the public on the advantages of improved roads, very much in the manner of circuses and Chautauquas that were popular at the time. He persuaded road machinery companies to donate equipment and trained operators, convinced the Illinois Central Railroad to donate an eleven-car train free of charge, and obtained the sanction of Martin Dodge, director of the Office of Public Road Inquiry, which supplied an expert whose salary and expenses were paid by the NGRA. The most elaborate expedition was sponsored jointly by the Southern Railroad and the NGRA, and cost the railroad over $80,000. It left Alexandria, Virginia, on October 29, 1901, and logged over 4,000 miles during its five-month journey. Such promotions were successful to the point that by 1910 there were literally hundreds of organizations at various levels devoted to the promotion of good roads. Among the few strong and effective groups were the American Automobile Association, founded by the motorists in 1902, and the American Road Makers, which included state engineers, road contractors, and road machinery manufacturers. However, many of the associations were primarily pressure groups which tried to get improved roads by influencing legislation.

Logan Waller Page, successor to Dodge as director of the U.S. Office of Public Roads, recognized the need for a permanent, umbrella-type organization to encompass the entire good roads movement. Page, born in Richmond, was educated at Virginia Polytechnic Institute and Harvard. Under his leadership the American Association for Highway Improvement was formed on November 27, 1910. This group sponsored the First American Road Congress in Richmond in 1911, and in 1912 shortened its name to the American Highway Association, joining the AAA to sponsor three subsequent annual American Road Congresses.

Today the American Highway Association would be characterized as a "lobby group," and its ads stated that engineers, manufacturers, contractors, and street and road officials were

largely represented in its membership. Dues were $5 a year. The Association had a small paid staff, but conducted its activities mostly through volunteer efforts of its members. The strength of the Association derived from having Page as president and W. W. Finley, president of the Southern Railway Company, as vice-president. This activity by the chief national highway official and the president of a major railroad in itself reflects the important role that railways had in promoting good roads during the early part of the twentieth century. In today's world where railroad, trucking interests, and public officials seldom agree on the equity of investment from public funds in various transportation modes, such cooperation may seem surprising. In the nineteenth century, however, the railroads were preeminent in the long distance movement of goods and people and recognized that the inability, particularly of farmers, to get products to the railheads was the weak link in the transportation system. Thus good roads were good for the railroads.

The purposes of the American Highway Association were stated as follows:

> To correlate and harmonize the efforts of all existing organizations working for road improvement.
>
> To arouse and stimulate sentiment for road improvement to strive for wise, equitable and uniform legislation in every state.
>
> To aid in bringing about efficient road administration in states and their subdivisions, involving the introduction of skilled supervision and elimination of politics from the management of public roads.
>
> To seek continuous and systematic maintenance of roads, the classification of all roads according to traffic requirements, payment of road taxes in cash, and adoption of the principle of state aid and state supervision.
>
> To advocate the correlation of all road construction so that the important roads of each county shall connect with those of the adjoining counties and the important roads of each state shall connect with those of adjoining states. . . .

Since the key to successful pursuit of these purposes was seen to be the local good roads organizations, a major element of the American Highway Association's effort was the continued promotion of the "Good Roads Trains." This activity of the Association was described in its Good Roads Yearbook for 1912 as follows:

> The Association cooperates with railroad companies and the national government in education campaigns through the medium of "Good Road Trains." Under this plan the government provides a miniature working exhibit illustrating types of roads and methods of construction, a stereopticon with slides, and assigns one or more demonstrators to accompany the train at government expense for salary, travel and subsistence. The Association at its own expense provides an experienced organizer who organizes in each county traversed a practical association and suggests a constitution and a working plan for it.

The working plan suggested for each county association included the formation of subcommittees on road administration, road materials, road construction, and maintenance and earth roads. That these efforts had been successful is evidenced by the fact that the 1912 Yearbook listed 402 county organizations in 34 states. In addition to these local organizations, there were 87 statewide or regional organizations and 22 national groups. Only five states, Utah, Nevada, New Hampshire, Vermont, and Delaware, reported no local or statewide organizations. Most of the local organizations were identified by names reflecting the county or locality. Some of the regional statewide organizations, however, reflected a vested interest or hope for

improvement, such as two Missouri organizations identified, respectively, as The Brotherhood Of Good Road Draggers and the 365-Day Road Club.

Virginia obviously had responded to the effort with one statewide group—the Virginia Road Builders Association—and 27 county organizations. Only North Carolina and Georgia had more local organizations than Virginia; North Carolina had 87 county road groups while Georgia had 46. Texas also had 27, while South Carolina and Florida had 24, Pennsylvania 17, and Missouri 18. Thus the five southeastern states had 235 local groups, or almost sixty percent of the total, perhaps reflecting the early effort by the Southern Railroad in 1901. The accompanying illustration shows Secretary of Agriculture Wilson and Director Page visiting a Road Improvement Train in October 1911.

> [*Image in original:* Road Improvement Train, 1911. *Caption:* Secretary of Agriculture Wilson and Logan Waller Page, director of the U.S. Office of Public Roads, visit a Road Improvement Train in 1911.]

A number of state highway commissioners and chief engineers were active in the American Highway Association, but most felt the need for an organization more tailored to their needs. This led Virginia's commissioner of highways, George P. Coleman, to propose in January 1914 an organization restricted to state officials. Director Page had hoped to organize such a group within the framework of the American Highway Association, but in March gave his blessing to the new organization, recognizing the need for "full and frank consideration of questions, particularly those of a technical character, untrammeled by commercialism or popular prejudices." Thus AASHO was born in December 1914 with significant input from Virginia and the American Highway Association.

It is not surprising, then, that the more coordinated effort led to the Federal Aid Road Act that was signed by President Wilson, a Virginian, on July 11, 1916. The case for good roads, constructed under state supervision, and with financial support from local, state, and federal governments has been made. Considerable credit for this achievement must be given to the railroads and Virginia, and Virginians were vitally involved in the significant events that began to place America on these good roads.

From Art to Science: Part I: Prelude to Research

Howard H. Newlon, Jr.

["Backsights" No. 89: originally published in the *Bulletin*, July 1983]

President Wilson's signing of the Federal Aid Road Act on July 11, 1916, was the result of three decades of promotional efforts and demonstration projects that had developed public and legislative support for good roads. Sparked by the late nineteenth century activities of the League of American Wheelmen and encouraged by the early twentieth century promotions by the railroads, a number of bills were introduced and debated in the U.S. Congress. The 1916 Act evolved from these debates, providing the first federal aid for roads generally rather than for specific purposes such as mail delivery and other federal responsibilities designated in the Constitution. The question of federal involvement in state and local roads has been a matter of debate since 1822, when President Monroe had vetoed an act that provided for tollgates that would collect monies that would reimburse federal funds that would be provided for maintenance of the Cumberland Road on the grounds that it was an unwarranted extension of the power vested in Congress to enforce collection of tolls for roads within states.

A report of a joint committee on federal aid in the construction of post roads provided the basis for the 1916 Act. This committee, with members holding many differences in views, had agreed unanimously on the need for and desirability of federal aid and its constitutionality, but not on any specific policy to follow in granting such aid. The report did indicate that the provision of aid should be undertaken in a large and systematic way rather than a small, haphazard way to dissipate the pork barrel potential. The committee's report was prophetic as it stated: "We believe that permanent highways will result in a very considerable adoption of auto-truck hauling in preference to rail transportation where distance is within a half day's run."

The railroads, through their "Good Roads Trains," had done their work; perhaps more successfully than they had anticipated.

The Federal Aid Road Act of 1916 placed an immense responsibility on Logan Waller Page, who was at that time director of the Office of Public Roads and Rural Engineering, an office formed by the merger within the Department of Agriculture of two formerly separate groups. To this agency was delegated the task of drafting regulations for appropriating funds and for carrying out the provisions of the Act. Draft regulations were prepared and suggestions from state officials were considered, with the result that regulations for implementing the Act were issued September 1, 1916. The harmonious cooperation between the federal and state officials was a good omen for the eventual success of the federal-aid program.

World War I brought new challenges, particularly a rapid increase in truck traffic and weights. Up to 1917 the main problems of highway engineers were financial. The technology of road building was an established art practiced essentially according to the precepts laid down by Trésagnet, Telford, and McAdam a century earlier when the wagon was the primary vehicle. These precepts, supplemented by the development of bituminous surfaces in the early 1900s, had

been used successfully on narrow and thin roads that met the needs of bicycles, automobiles, and farm vehicles.

But the feeling of technological well-being came to an abrupt end in the spring of 1918 when hundreds of miles of roads failed across the nation. A representative of the Bureau of Public Roads reported:

> Hundreds of miles of roads failed under the heavy motor-truck traffic within a comparatively few weeks or months. . . . The failures were not only sudden but complete, and almost overnight an excellent surface might become impassable. . . . A very large portion of the failures have been characterized by an almost simultaneous destruction of the entire road structure, and not merely the disintegration of the wearing course or pavement proper.

[*Image in original:* Carl Rakeman painting of an early study of truck damage to roads (from Rose, *Historic American Highways*). *Caption:* Truck damage to roadways led to a coordinated national research program by 1920.]

Director Page made the investigation of these massive and disastrous failures his first order of business for 1918. Reports from experts in his office sent to the various states bear the names of such men as A. T. Goldbeck and Frank H. Jackson, who were destined to redefine and extend the technology of road design and construction during the next four decades. One of the most significant findings was that many of the failures were due to moisture softening the clay soils below the pavement structure. J. L. Harrison concluded that these failures were caused by "non-gravitational water," that is, water held in such soils by capillary attraction as opposed to surface water which pavements were designed to resist. The age of a more scientific approach to road building had arrived.

Even as the engineers sought to understand the technical reasons for the failures, the obvious reasons in the minds of the public were the trucks, some of which had capacities greater than five tons. Angry demands were made for limits on the weight of vehicles and for crushing taxes on trucks to make them "pay their fair share." Delaware's influential chief engineer, Charles Upham, cautioned that the motor truck was not just a wartime phenomenon, but would be around after the war was over. He stated:

> . . . the motor truck which has developed during abnormal times has shown that it has solved an economic problem, and this solution assures us that . . . the heavy truck will be utilized for transporting freight and express within expanding limits. Therefore, . . . we must build and maintain in such a way that our roads will withstand, as permanently as possible, the demands of the future heavy truck traffic.

States began to enact regulations to limit the loads that could be carried, and there were significant conflicts among the various interests. It was agreed that a five-ton capacity truck was the largest that should be allowed on rural roads, although about fifteen percent of the trucks then in use were of greater capacity. Urban roads and streets could carry heavier loads, so the urban-rural disparity had to be addressed. Spokesmen for the infant but rapidly growing trucking industry argued against unrealistically low weight limits, such as the three-ton limit that had been advocated by some states, stating that seven-tons per axle was more realistic.

So long as the country was at war little could be done on the engineering and economic issues, but a joint highway congress held in Chicago in December 1918 addressed the questions and adopted a significant resolution that not only recommended a thorough investigation of motor truck regulations, but also urged the states to undertake experiments on different types of pavements to develop basic engineering knowledge. The age of highway research was dawning.

This congress also recommended that gross loads of 14 tons be permitted on the highways, provided the load per inch width of tire did not exceed 800 pounds. The 800-pound figure was recommended by tire manufacturers as the maximum economic loading for solid truck tires. Heavier loads would, they said, cause crushing of the rubber and premature failure by fatigue. At that time the widest tire manufactured was 14 inches, so the maximum load that could be economically carried by a two-wheel axle was 22,400 pounds. This value, and others based upon the 800-pound figure, found its way into load limits imposed by some states. Even with the advent of pneumatic tires the value persisted indirectly and was one of the axle loads selected for each of the subsequent major experimental road tests (One-MD-1949-52, WASHO-1952-4, and AASHO-1956-60). Thus, initially the strength of the tire controlled the design of the pavement, which in subsequent years controlled the design of trucks.

Just before the Chicago congress, Thomas Agg, testing engineer of Iowa, had focused attention on the need for better design with an article published in *Public Roads* in which he stated:

> During the past 10 years, the transition from horse-drawn to motor traffic has been so nearly complete that horse-drawn traffic can no longer be considered a controlling factor in highway design; yet practically all of the basic principles of highway construction were evolved for horse-drawn traffic. . . It seems imperative that investigation in the field of highway engineering be prosecuted with the utmost vigor during the next few years, else it will be found that much of the money expended for highway improvement has not secured highways of the maximum serviceability because of design and requirements for materials are based on unsound theories or inadequate tests.

These sentiments were endorsed by A. R. Hirst, president of AASHO, who pledged support “for this very great and necessary work . . . to develop the theories upon which the future science of highway engineering should be based.”

(To be concluded next month)

From Art to Science: Part 2: Research Comes of Age

Howard H. Newlon, Jr.

["Backsights" No. 90: originally published in the *Bulletin*, August 1983]

The damage to the nation's roads resulting from the dramatic increase in the size and number of trucks during World War I made imperative a more rational and scientific approach to road building. Appeals for this as well as for additional restrictions on the use by these vehicles on roads that had been built for bicycles, horse drawn and light motor traffic were soon heard throughout the land.

These appeals set the stage for a series of events that resulted in the formation, on November 11, 1920, of the National Advisory Board on Highway Research under the auspices of the National Research Council of the National Academy of Sciences. Thus began what today is the Transportation Research Board. The organization of the Advisory Board was completed in July 1921, with the appointment of Dr. W. K. Hatt of Purdue University as its executive director. As his first job, Director Hatt prepared a list of nineteen "fundamental questions in highway transport." Some of these questions were:

- What is the economical highway track unit for each of the several situations, e.g., intercity, farm to market?
- What is the cost of transport arising from the vehicle and from the road?
- What type of road paving should be selected for a specific transport unit?
- How should the design of the road and paving be modified to meet changing conditions of subgrade, climate, etc.? How shall subsoils be improved?
- What sum of money is the locating engineer justified in spending to avoid increase in distance, curvature, rise and fall, maximum grade, maximum curve?
- What is the capacity of a road of given width as expressed in vehicles per hour, ton-miles per year, etc.?
- What is the appropriate unit for expressing traffic for various purposes?
- How can the volumetric changes in roads be overcome?
- What is the economic life of various types of roads?
- What police regulations should control the use of roads?

- What principles should govern the selection of a system of roads in its various parts, as influenced by interstate, intrastate, county or local traffic?

- To what extent do social betterment, military use, i.e., social value, and other imponderables enter into highway policy?

- How shall safety be ensured on the roads?

In August 1921, a meeting was held at the University of Maryland at which Director Hatt discussed with representatives of industry and educational institutions, as well as federal and state highway people, the best way to mobilize and coordinate the efforts of research agencies in a comprehensive program. He set forth a philosophy that has subsequently guided the activities of the Transportation Research Board by stating that the National Research Council would be glad to coordinate the research but would not engage in research directly.

Even after sixty years, many of Director Hatt's fundamental questions retain validity, not because answers have not been obtained, but rather because changing conditions, the complex interactions between transportation and society, the diversity of environmental considerations and materials that must be accommodated, and the emergence of new technologies make absolute answers to some of these questions difficult, if not impossible.

It is interesting to note that there currently is considerable interest in the issue of cost responsibility; i.e., what proportion of the cost of roads and other forms of transportation should be borne by various classes of vehicles and users. Certainly, Director Hatt could not have anticipated the increased attention "social betterment, social value, and other imponderables" would demand. Ensuring and improving safety continues to receive attention.

In 1981, the Transportation Research Board identified ten critical transportation issues for the 1980s. When these are compared with the questions posed by Hatt there are many similarities. Differences derive mainly from today's perspective of a multi-modal system, rather than just highways, the increased effort needed to protect the investment in the overall system, and the economic issues associated with the complex system.

In 1921, however, the immediate needs were to repair the nation's crumbling highways and to provide roads that would accommodate the trucks that were now clearly seen to be an important part of the nation's economy as well as the dramatically increasing number of automobiles. In 1900, factory sales of automobiles were 4,192. By 1914, annual sales had increased about tenfold. Only two years later, 1916, the number was over 1.5 million, a reflection on Henry Ford's genius in introducing mass production techniques. Over the next seven years, the annual factory sales more than doubled.

In 1921, the Bureau of Public Roads was the only research organization that was prepared to begin work immediately on the project identified. At that time the BPR had thirteen major studies under way and its research budget was about one-third of the total national expenditure on highway research. It has been estimated that in 1920, twenty-two state highway departments spent about $175,000 on research and twenty-one colleges and universities about

$150,000. In addition, the BPR spent about $150,000. By comparison, the typical National Cooperative Highway Research Program research project today requires about $150,000.

Chief Thomas McDonald took the lead in the national program by expanding the BPR's in-house activities and also by entering into cooperative research agreements with state highway departments and universities. He was greatly aided in his efforts by the Federal Highway Act of 1921, which authorized the Secretary of Agriculture to deduct up to two and one-half percent of all federal-aid appropriations for administering federal aid "and for carrying on necessary highway research and investigational studies independently or in cooperation with the state highway departments and other research agencies. . . " From 1922 to 1932, the sums so set aside amounted to $1.87 million per year, of which perhaps one-half went to research.

Throughout the 1920s, the efforts concentrated mainly on soil and pavement research to provide immediately usable information to guide the large paving programs already under way. As a result of these studies, all states stopped using thin pavements which typically had been built four or five inches thick, and rapidly adopted a twenty-foot minimum width for main road pavements. The wider width was not only to provide more safety and freedom to maneuver, but also to reduce loads at the pavement edges that caused excessive edge and corner breakage of concrete pavements. This recommendation was based upon findings of the Bates experimental road, financed by the Illinois Division of Highways and the Pittsburg, California, test track built by the Columbia Steel Company with private funds. Apart from these two experimental installations, the brunt of the research effort in the twenties was borne by the federal government, in-house or through its cooperative agreements. In 1928, the American Association of State Highway Officials recommended, in its first road standards, that the minimum width of one traffic lane be ten feet.

A major result of this research emphasis was the rational method of pavement analysis proposed in 1925 by Professor H. M. Westergaard of the University of Illinois, which removed much guesswork from the design of concrete slabs.

Out of BPR investigations there came a practical system for classifying soils into eight groups based upon physical tests whose results could be used to relate properties of soils to pavement performance and design. This system and others that followed permitted the selection of pavement depth and types in advance of construction to meet specific field conditions.

Planning studies and emphasis on questions of safety followed. Technology provided vehicles with higher speeds and greater carrying capacity. Even the Great Depression did not significantly reduce the demand for more roads nor the funds available. While revenues from personal income and property taxes dropped precipitously, between 1929 and 1932, receipts from vehicle registration and fees dropped about ten percent. The shrinkage of about $27 million per year in revenues from registrations and fees was more than made up for an increase of $55 million in fuel taxes. The motor car was no longer perceived as a luxury but rather as a necessary part of America's life-style. The beginning of the transition in road building from an art to a science that occurred during the 1920s had played a large role in this perception.

In a real sense, the entire nineteenth century had been a period of experimentation with respect to transportation modes, policy, methods, and funding. Virginia, like the rest of the nation, had seen the growth of canals, their replacement by the railroads, and the turnpike era for horse drawn vehicles. It had developed the first statewide transportation agency in the Board of Public Works and had pioneered in innovative funding of its turnpikes with joint stock companies, using both public and private funds. The Board of Public Works had authorized James French to construct an "experimental railway" in Richmond, the details of which are unclear. With regard to its road surfaces, it had stuck with the tried and true McAdam and Telford designs. Thus when the plank road craze swept the country in the 1840s, Virginia's position had been one of cautious optimism. In its annual report for 1851, by which time the plank road effort had waned nationally, the Board of Public Works included reports from two plank road companies, and stated that "in Virginia they are but experiments whose every step is attended by doubts, but their success which may now be regarded as inevitable will be the dawn of a new era." Clearly, the results of this "experiment" did not bring about a new era. But the transition from art to science and the beginning of systematic research that occurred some eighty years later did, and set the stage for Virginia's formalized research effort that led to the formation of the Research Council in 1948.

A Trip Along the Natchez Trace

Howard H. Newlon, Jr.

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As settlement progressed westward, the interior rivers such as the Ohio and the Mississippi began to assume major importance. As these rivers and their tributaries were improved for navigation, they became the major transportation arteries for goods and commerce. Beginning about 1785, men from Ohio, Kentucky, and other parts of the western frontier floated products such as flour, pork, tobacco, hemp, and iron down the Mississippi to markets at Natchez and New Orleans. While floating the crude flatboats downstream was not without peril, it was possible. The long return trip northward against the river currents and ice floes of the northern reaches of the rivers was not possible until the advent of river streamers some thirty years later. During the period of transition from poled boats to river streamers, the boatmen were forced to sell their boats at Natchez or New Orleans and either walk or ride horseback for the 450-mile trip across the country from Natchez to Nashville.

From Nashville the boatmen could proceed to the Ohio Territory or, if desired, to the Atlantic seaboard at Philadelphia via (1) a connection with the Wilderness Road across Kentucky and the Cumberland Gap to its connection with the trail through the Shenandoah Valley, (2) a trail leading to the Maysville, Kentucky, crossing of the Ohio River, thence through Wheeling, Pittsburgh, and Lancaster (the portion from Maysville to Wheeling was known as Zane's Trace after Ebenezer Zane, who was authorized by the Congress to open the road in 1797), or (3) the Tennessee Path to Knoxville and north through the Shenandoah Valley to Lancaster. The total distance of these routes varied from 1,280 to 1,410 miles.

With the surrender of all claims to lands north of the 31st parallel by Spain in 1798, the United States created the Mississippi Territory with Natchez as its capital. For years the frontier economy had been largely based upon the Spanish silver that the boatmen carried home from the sale of their goods (and boats). Even after the lower portion of the overland route was ceded to the United States, a considerable portion of the land there was occupied by the Natchez, Choctaw and Chickasaw Indians. In general, these were friendly Indians and it was official federal policy that:

> Government should firmly maintain this ground, that the Indians have a right to the occupation of their lands independent of the States within whose chartered lives they happen to be; that until they cede them by treaty, or other transaction equivalent to treaty, no act of a State can give a right to such lands . . . The Government is determined to exert all its energy for the patronage and protection of the rights of the Indians.

Following Spain's relinquishing of its claim to the lands, the United States, in 1801, negotiated treaties with the Chickasaw and Choctaw nations. The treaty with the former stated:

> The Mingco (chiefs), principal men and warriors of the Chickasaw nation of Indians, give leave and permission to the President of the United States of America to lay out, open and make a convenient wagon road through their land between the settlements of Mero district (Nashville) in

> the State of Tennessee and those of Natchez in the Mississippi Territory, in such a way and manner as he may deem proper; and the same shall be a highway for the citizens of the United States and the Chickasaw. . . . Provided always that the necessary ferries over the water courses crossed by the said road shall be held and deemed the property of the Chickasaw nation.

Under this treaty which was concluded at Chickasaw Bluffs (Memphis), on October 24, 1801, the Chickasaws received miscellaneous goods invoiced at $702.21. The Choctaw Treaty, concluded on December 18, 1801, at Loftus Heights (Fort Adams), contained similar wording but the Choctaws apparently were better bargainers since they received "the value of two thousand dollars in goods and merchandise" and "three sets of blacksmith's tools." At the conclusion of these treaties, eight companies of infantry troops under the command of Colonel Butler began to clear the trace southward from Nashville to meet another group of six companies commanded by Colonel Gaither which was working northward from Natchez. The road was completed in 1803 and became known as the Natchez Trace.

Although the Natchez Trace proved a significant aid to thousands of returning boatmen and migrating settlers, it was initially conceived with strategic military ends in view in the event the United States should become embroiled in conflict with Spain over the port of New Orleans. In 1812, the United States declared war on England. Because Spain was an ally of Britain, General Andrew Jackson's Tennessee militia was ordered down the Natchez Trace to protect New Orleans from a threatened Spanish invasion from West Florida. The invasion did not materialize, and Jackson was ordered to disband the militia. He refused and marched his troops back up the Natchez Trace sharing their hardships and, according to legend, earning the nickname "Old Hickory." Later, in 1815, the British attempted to seize control of the lower Mississippi, but Jackson stopped them at the Battle of New Orleans. The Natchez Trace provided vital access to this important battle.

As important as was the military significance of the Trace, its history is vitally linked with peacetime access to the developing lower Mississippi Valley during the early years of the nineteenth century. Mail service had been instituted to Natchez in 1802, and the Trace took on even greater importance after the Louisiana Purchase in 1803. Jefferson was one of its champions, and it was during the first year of his presidency that the treaties were signed that brought the route into existence as a major road, providing access to the area by many Virginians and former Virginians via Kentucky and Ohio.

Captain Meriwether Lewis, one of Jefferson's protégés who served as Governor of the Mississippi Territory, lost his life on the Natchez Trace, as will be later described. The Trace continued its vital role until the coming of the steamboats, which by 1820, were serving New Orleans and the interior cities to the north. These steamboats, new roads, and new towns, and the passing of the frontier, finally reduced the Trace to a quiet forest lane and ended its significant role in the nation's development.

In 1934, Congress passed a law directing a study leading to the construction of the Natchez Trace Parkway, to follow as nearly as possible the original route of the old Natchez Trace. Today the Parkway extends approximately 455 miles between Natchez and Nashville. With the exception of a ten-mile segment near Jackson, Mississippi, and the final fifty miles to Nashville, Tennessee, a limited-access, commerce-free, and tree-shielded two-lane road lies

lightly on the land and provides opportunity for observing and exploring archeological sites, historical landmarks, and nature trails, as well as recreational and camping areas.

During July, the writer made in two days the journey from Natchez to Nashville that had taken the flatboaters weeks and even months on foot or horseback. Traveling at a rather leisurely pace in conformance with the rigidly enforced speed limit of 50 miles per hour in an air-conditioned car was in notable contrast to the following description of the trip posted at a roadside kiosk:

> This early interstate road building venture produced a snake-invested, misquito-beset, robber-haunted, Indian pestered forest path.
>
> Lamented by the pious, cussed by the impious, it tried everyone's strength and patience.
>
> When the trail became so water-logged that wagons could not be pulled through, travellers cut new paths through the nearby woods. Here you see three cuts made to avoid mud into which ox carts and wagons sank making progress slow, dangerous, or even impossible.

Along the parkway, signs indicate sections of the original Trace such as that shown in the accompanying illustration**.** The deep cuts that characterize much of the original route have resulted from erosion of loess, a windblown, fine-grained soil that remains stable in almost vertical banks.

> [*Image in original:* Photograph (1980s) of the Natchez Trace. *Caption:* Sections of the original Natchez Trace can still be seen. The deep cuts are the result of the erosion of the fine-grained soil that oddly remains in nearly vertical banks.]

At milepost 10.3 is Emerald Mound, built about 1300 by the ancestors of the Creek, Choctaw, and Natchez Indians. This huge mound covers nearly eight acres and measures 770 by 435 at its base. This is the largest of several ceremonial Indian mounds along the Trace, the earliest of which date from 700 A.D.

Along the Trace are a number of sites where stood the twenty "stands," the name for inns in Mississippi. Like the "ordinaries" in Virginia, these inns provided bed and board for travelers. At milepost 15.5 in Mount Locust, a restored stand operated as a living history exhibit by people who live as if it were 1813. Upon entering the three-room cabin, you are asked by the proprietor if you are "staying the night or just passing through?" Two rooms each contain two beds, while the central room houses dining tables, fireplace, etc. In answer to the question, "How many can you sleep?" the proprietor replied, "About fifty; four to a bed and the rest on the floor." Other stands along the route bear the names of their operators such as Dean's or Brashear's, who were licensed by the federal government. At milepost 327.8 the Trace crosses the Tennessee River. Here stood Colbert's Stand and ferry. Its operator George Colbert, of Indian ancestry, is reported to have charged Andrew Jackson $75,000 to ferry his army across the mile-wide river.

At milepost 375.8, a 2.5-mile section of the original trace has been paved and is the only portion that can be driven. Here the Trace reaches an elevation of about 1,500 feet with mountain vistas a sharp contrast to the southern end.

At the 380 milepost is Napier Mine, an open-pit mine that was worked until the late nineteenth century. Exhibits explain the mining operation and the processing of iron ore.

Near the end of the constructed portion of the parkway, at milepost 385.9, is Grinder's cabin and the grave of Meriwether Lewis. The cabin, the trace marker, and a memorial to Lewis are shown in the accompanying photograph. The marker reads, in part:

> But, before Talledega and New Orleans, before soldiers of Jackson had given renown to the Natchez Trace, it received its immortal touch of melancholy fame when Meriwether Lewis, journeying over it on his way to Philadelphia, to edit the story of his great expedition, here met his untimely death on the night of October 11, 1809.

[*Image in original:* Photograph (1980s) of Grinder's cabin. *Caption:* Grinder's cabin (far background), where famed explorer and Charlottesville native Meriwether Lewis lost his life, is adjacent to the Natchez Trace at parkway milepost 385.9.]

The circumstances of Lewis's death in Grinder's cabin adjacent to the Natchez Trace remain a mystery. Having traveled the Trace and standing near the cabin enroute to Charlottesville, the place of Lewis's birth, I was once again awed by the difficulties that he and his contemporaries must have faced in traveling across a vast continent that today can be traveled in a matter of a few hours. In Virginia, as throughout the nation, we take convenient travel for granted. In Virginia too, we have crossing or paralleling our modem highways, many overgrown forest paths and roads that could tell stories of travel, troubles, and tragedy similar to those of the Natchez Trace.

The Blind Roadbuilder

Nathaniel Mason Pawlett

["Backsights" No. 92: originally published in the *Bulletin,* October 1983]

While the achievements of an unlettered genius such as Claibourne Rice Mason are impressive, one can only marvel at those of the blind English roadbuilder John Metcalf (1717-1810). Born at Knaresborough, "Blind Jack" Metcalf lost his sight at six as the result of smallpox. Nevertheless, in six months he learned to grope his way to the end of the street and back without a guide, and in three years could carry a message anywhere in town. Growing up strong and healthy, he climbed trees for birds' nests, rambling in the lanes and fields alone, and was soon familiar with the country for miles around Knaresborough.

[*Image in original:* Print showing Metcalf. *Caption:* "Blind Jack" Metcalf, an outstanding eighteenth century road and bridge builder.]

Following this, he learned to ride and follow the hounds and to dive and swim, on one occasion saving the lives of three companions. At home, he learned the fiddle, and was shortly earning money playing at country dances and assemblies. Once he acted as a guide to a man travelling at night from York to Harrogate along a crooked road, much to the man's amazement when he arrived at his destination and discovered his guide to be blind.

Beyond this, he soon became known as a wit, a successful cardplayer, and a rather shrewd dealer in horses. He played at bowls, and rode races on circular courses by using the sounds made by strategically located friends to judge distances. Apparently possessed of a winning personality, in 1739 he astonished everyone by eloping with an innkeeper's daughter the night before her marriage to another man. He married her the next morning, settling in Knaresborough.

A model husband, his amazing exploits however continued. Walking to London and back, he easily outdistanced Colonel Liddel's coach on the return journey. A recruiting sergeant in 1745, he enlisted 140 of the Knaresborough men on the King's side. Sixty of these, drafted into a company, marched to Newcastle with Blind Jack Metcalf at their head playing his fiddle. Metcalf fought at the battle of Falkirk, afterwards playing at Aberdeen at a ball given by the Duke of Cumberland. He was also present at the battle of Culloden.

Returning to Knaresborough, he engaged in smuggling, and traded in cotton and worsted goods and horses. In 1750, he made some money doing military transport work, and in 1754, he began running a stage line between York and Knaresborough, strange business indeed for a blind man. Shortly he had realised a considerable sum of money.

Still, he had not yet entered into what would become the principal business of his life. Blind since the age of six, he had never been able to study books; instead he studied men and rapidly learned to read their characters. Familiar with the country and its roads from his travels,

he developed mental processes akin to those developed by Claibourne Rice Mason, and could measure timber in the stack and rapidly reduce the contents to feet and inches. Had Metcalf not been blind, he might have developed into one of the outstanding men of his age. As it was, he became one of the greatest of its road and bridge builders.

About 1765, an act of Parliament called for the construction of a turnpike between Harrogate and Boroughbridge. Metcalf, seeing the potential for future work, shrewdly contracted for three miles of this road. Selling out his stage interests, he proceeded with his new undertaking, completing his portion of the road first. His success with this emboldened him to undertake a bridge at Boroughbridge, which he also completed satisfactorily. It is related of him that when he came before the trustees for the bridge contract he told them he could describe the bridge if they would write down his figures, saying: "The span of the arch, 18 feet, being a semi-circle, makes 27; the arch-stones must be a foot deep, which if multiplied by 27, will be 486; and the basis will be 72 feet more. This for the arch; but it will require good backing, for which purpose there are proper stones in the old Roman wall at Aldborough, which may be used for the purpose, if you please to give directions to that effect."

These were only the first of a vast number of projects he would undertake over more than thirty years. Many anecdotes are related of him. Once, going over some local ground through which a road was to be made, he told his workmen that it felt "different" from the adjoining ground and directed them to try for stone or gravel underneath. A few feet down they found a Roman causeway from which much material was obtained for the new road.

Not only did Metcalf build roads laid out by others, he personally laid out many of those he built. One of his contemporaries described Metcalf at work:

> With the assistance only of a long staff, I have several times met this man traversing the roads, ascending steep and rugged heights, exploring valleys and investigating their several extents, forms, and situations, so as to answer his designs in the best manner. The plans which he makes, and the estimates he prepares, are done in a method peculiar to himself, and of which he cannot well convey the meaning to others. His abilities in this respect are, nevertheless, so great that he finds constant employment. Most of the roads over the Peak in Derbyshire have been altered by his directions, particularly those in the vicinity of Buxton; and he is at this time constructing a new one betwixt Wilmslow and Congleton, to open a communication with the great London road, without being obliged to pass over the mountains. I have met this blind projector while engaged in making his survey. He was alone as usual, and amongst other conversation, I made some inquiries respecting the new road. It was really astonishing to hear with what accuracy he described its course and the nature of the different soils which it was conducted. Having mentioned to him a boggy piece of ground it passed through, he observed that 'that was the only place he had doubts concerning, and that he was apprehensive they had, contrary to his directions, been too sparing of their materials'.

Over the years Metcalf built many miles of roads, as well as bridges, culverts and retaining walls, often surmounting almost unbelievable engineering problems by his ingenious solutions. One account gives the figure of 180 miles of construction for which he got not less than £65,000, an immense sum for that time. He was more than seventy when he ceased road building, but like Mason, still vigorous and enterprising and never idle. A daughter's husband was engaged in the cotton business and so Metcalf tried that for a while. Finding it unprofitable,

he returned to building roads, finishing his last one in 1792 at the age of seventy-five. Retiring then to a small farm, he operated it until his death in 1810 in his ninety-third year.

Deprived of his sight at an early age, John Metcalf might have simply given up. That he did not, instead persevering and developing his remaining faculties, attests to the superb materials of which the man was made and constitutes a lesson for all of us.

"A guidepost rose within his view . . ."

Nathaniel Mason Pawlett

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Many people have had their curiosity piqued by the engraving used on the covers of some of the Council's publications dealing with transportation history. One woman even called from Northern Virginia to enquire if her group could get the artist to do some similar work for them. The truth is that this print is taken from a satire upon William Gilpin's picturesque tours called *The Tour of Doctor Syntax in Search of the Picturesque*, which appeared in book form in 1812, having first appeared in serialised form in 1809 in *The Poetical Magazine* put out by Rudolph Ackermann (1764-1834), the London print-seller.

"Dr. Syntax Losing His Way."

Originally conceived by Ackermann as a magazine serial, the drawings were done by Thomas Rowlandson (1756-1827) at the rate of one a month. Upon completion, each was taken to William Combe (1741-1823), then residing in debtor's prison, and he composed the accompanying verses, never knowing until the plate was received, so the story goes, exactly what he would have to write about. That he was able to accomplish this as well as he did on a monthly basis speaks well of the abilities of the man.

Although a number of the Rowlandson plates show either roads or taverns or bear on transportation in some way, "Dr. Syntax Losing His Way" was initially selected for our publications in the hope that its economy of ornament would allow good and easy reproduction, and also for the fact that its topography resembled that visible from the Three Notch'd Road in the vicinity of the Twelve Mile Tree near the present Shadwell in Albemarle County. In the

background are landforms that could be the Southwest Mountain, the Rivanna River water gap, Monticello, and Carter's Mountain.

Beyond these superficial resemblances, the verses appended by Combe treated the ever-present problem of the vandalism of road markers and signs, a phenomenon not known in Virginia then as now. Doctor Syntax, having come upon the defaced signpost and found out that he is lost, in his perplexity decides to sketch the post and include elements both picturesque and moralistic. From the verses one suspects that the group of mules or asses was inserted as a tribute to those who defaced the signpost and caused Doctor Syntax to lose his way.

Thus, as he ponder'd what to do,
A guide-post rose within his view;
And, when the pleasing shape he spied,
He prick'd his steed, and thither hied;
But some unheeding senseless wight,
Who to fair learning ow'd a spite,
Had ev'ry letter'd mark defac'd,
Which once its sev'ral pointers grac'd.
The mangled post thus long had stood,
An uninforming piece of wood;
Like other guides, as some folks say,
Who neither lead, nor point the way.
The Sun, as hot as he was bright,
Had got to his meridian height;
'Twas sultry noon—for not a breath
Of cooling zephyr fann'd the heath—
When Syntax cried —"Tis all in vain
"To find my way across the plain;
"So here my fortune I will try,
"And wait till some one passes by:
"Upon that bank awhile I'll sit,
"And let poor Grizzle graze a bit;
"But as my time shall not be lost,
"I'll make a drawing of the post;
"And, tho' your flimsy tastes may flout it,
"There's something picturesque about it:
"Tis rude and rough, without a gloss,
"And is well cover'd o'er with moss;
"And I've a right (who dares deny it?)
"To place yon group of asses by it.

References

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Why Virginia Is Different: The Secondary System: Part I

Howard H. Newlon, Jr.

["Backsights" No. 94a: originally published in the *Bulletin*, January 1984]

The Virginia Department of Highways and Transportation is responsible for the third largest road system in the nation. Virginia's system comprises almost 55,000 miles, including one of the five most intensively traveled segments in the nation, Route 395 near Washington with a daily traffic volume of almost 150,000 vehicles per day, as well as a limited number of segments in the secondary system that carry fewer than five vehicles per day. As contrasted with Virginia, California, in some respects a mecca for automobile traffic, has only 18,000 of its 174,000 mile road network under state control, the remainder being the responsibility of the federal government or counties and other local agencies. These facts come as a surprise to the many persons not aware that Virginia (except for local options exercised by Arlington and Henrico counties) is one of only four states in the nation in which there are no county road organizations, the others being Delaware, North Carolina, and West Virginia.

Such an arrangement is not surprising in the case of Delaware because of its small size, but the question as to why the remaining three states are organized differently from the vast majority of the others is often asked and worthy of some discussion.

As previous "Backsights" have described, responsibility for roads in Virginia initially was placed upon the Church Vestry and later with the county courts. After the creation of the Board of Public Works in 1816, a degree of statewide coordination and state participation in joint stock companies evolved, but the counties retained responsibility for funding, building, and maintaining the majority of the roads. Funds were derived from a county or district road tax that was a dedicated portion of the real estate levy. This system had replaced the English system initially used whereby each male tithable was required to furnish a number of days per year for labor on the road.

In 1906 the Virginia Highway Commission was established along with the state convict road force, and counties could receive either funds or convict labor for use on their roads. Most chose the latter.

In 1918 the General Assembly designated Virginia's first state highway system, which comprised about 4,000 miles of major intrastate roads on 28 routes.

At this point Virginia had essentially three systems: state highways, state-aid roads, and county roads. The state highways were designated by the General Assembly for improvement with federal funds, state funds, state convict labor, and local funds. All stages of construction and maintenance were under the supervision of the State Highway Commission with maintenance provided at state expense.

State-aid roads were designated to be improved from a fund (in 1918, $300,000 per annum) through apportionments to the counties not provided convict labor in proportion to the amount of state tax they paid into the fund. Convict labor was apportioned among the counties in order of their applications for such aid but a county could not secure such labor for longer than five years if other counties desiring such services were unsupplied. In the case of state-aid roads, the state assistance was for construction only; completed roads were maintained by the counties at their own expense.

County roads comprised all other roads in the state. These were opened, controlled, constructed, and maintained by county or district boards with local funds. In 1917, the year before the state highway system was created, there were more than $7 million of county and district roads and bridge bonds outstanding.

[*Image in original:* Old Augusta County road equipment building. *Caption:* The old Augusta road equipment depot has been converted to house several small businesses in downtown Staunton.]

These three systems continued through the 1920s, during which time considerable attention and debate was focused on raising the revenue to meet the mounting needs.

The state constitution of 1869 had prohibited any state debt except for emergencies. This restriction remained in the revised constitution of 1902, but an amendment, promoted by the Good Roads Association, described in previous "Backsights" and approved by 61,000 votes in a referendum in 1920, permitted the legislature to issue bonds to build and repair roads. State Senator Harry F. Byrd, Sr., who was chairman of the Road Committee in the Virginia Senate, opposed bonds and urged the levying of a three-cent-a-gallon in gasoline tax to produce the needed revenue. The General Assembly, in an extra "roads" session called by Governor E. Lee Trinkle in 1923, approved the Byrd gasoline tax proposal, and ordered, in addition, that a suggested $50 million bond issue be submitted to referendum in November. This time, by a margin of 46,000 votes, the citizens rejected the bonds issue. This action set the subsequent course of "pay as you go" highway revenue financing in Virginia and, subsequently through Senator Byrd's influence, the application of the "pay as you go" approach in the establishment of the Highway Trust Fund as part of legislation creating the interstate system in 1956.

As economic conditions worsened throughout the nation during the late 1920s, the local real estate tax burden increased greatly. At the same time revenues from gasoline taxes increased, in fact, even throughout the depths of the Great Depression, revenues from gasoline taxes continued to increase while other tax revenues fell significantly.

In 1931, North Carolina became the first state to place all of its roads under state rather than mixed state-local control. Virginia followed suit in 1932, when the General Assembly enacted the "Byrd Road Act," inspired by the former Winchester senator who two years before had completed a term as governor. This act authorized the establishment of the state secondary system and permitted each county to give its road responsibility to the Highway Commission. Initially, four counties—Arlington, Henrico, Nottoway and Warwick—chose to keep the responsibility. In 1933, Nottoway revised its earlier decision, and many years later, Warwick

gave up its county status to become a city, and still later merged with Newport News. Today Arlington and Henrico continue to operate their own roads.

In 1933, West Virginia adopted the state system approach and Delaware became the last state to assume responsibility for all roads at the state level in 1935. A more detailed look at conditions that led to these changes will be taken in Part II.

Why Virginia Is Different: The Secondary System: Part II

Howard H. Newlon, Jr.

["Backsights" No. 94b: originally published in the *Bulletin,* February 1984]

As described in Part I**,** the state of Virginia assumed responsibility for local roads from the counties in 1932 when the state secondary system was created by the General Assembly. This followed by one year similar action in North Carolina and preceded by one year West Virginia's adoption of the state system approach. In 1935, Delaware became the last state to assume responsibility for all roads at the state level.

Since North Carolina was the first state to take such action, factors that led to this decision are worthy of discussion. North Carolina's system was much like Virginia's, comprising about 5,000 miles of roads. According to a 1981 article in *Popular Government* by Charles D. Liner, an economist with the Institute of Government of the University of North Carolina, the fiscal condition of the state and local governments in North Carolina was perhaps worse than could be found in any other state. In 1930-31, only New York, a much wealthier state, had a higher per capita debt. North Carolina was perceived to be on the verge of bankruptcy.

Finding itself in such economic straits, North Carolina took the bold and rather surprising step of hiring the Brookings Institution, then only four years old, to make a comprehensive study of state and local governments and report to the General Assembly at its 1931 session. Reflecting the research tenor of the times, the Brookings report recommended highly centralized state control and financing of a number of government services. Not all of these recommendations were accepted but the arguments for the revised highway system were appealing and convincing, since this was one of the major items of county expense. The report noted that of the $8.2 million in county revenues spent for road construction and maintenance, $1.3 million had been spent for construction and $6.6 million for maintenance. These expenditures included $2.2 million for the purchase and operation of road machinery. In addition, ninety-two of the one hundred counties had applied either all or a major part of the state road fund aid, for a total of $2.7 million, to debt charges. The report argued that efficiencies, higher technical standards, and economics of scale could be achieved by reducing what was seen as duplications of effort, staff, facilities, and equipment by local and state road agencies. Although relinquishing control of roads at the local level was not without disadvantages, these were outweighed by the fact that the local real estate tax burden would be dramatically reduced (total property tax revenues in North Carolina fell 43 percent between 1930-31 and 1933-34).

On the Virginia scene, the 1911 Culpeper County tax bill in the accompanying photograph illustrates the distribution of the tax revenues among the various services. Approximately twenty percent, an amount equal to the local school tax, was devoted to roads. A twenty percent reduction in local property taxes was obviously an attractive alternative to local responsibility for roads. An economist has estimated that rural property taxes in Virginia reduced by about $2.9 million annually after creation of the state secondary system in 1932,

[*Image in original:* 1911 Culpeper County tax bill. *Caption:* A 1911 Culpeper County tax bill shows the distribution of the county's tax revenues.]

The Highway Department's annual report for the year ending June 30, 1933, briefly described the activities in connection with the takeover of the local roads.

As soon as the act of the legislature was passed directing the State Highway Commission to take over these roads, engineers were placed in the field and an inspection made of each mile. A sketch map was drawn showing the number of houses in sight of the roadway, rural free delivery and school bus routes noted, bridges, condition, type of surface, the names of the stream crossings, the distance between points of intersection, and other data. This gave a complete history and a general description of each county road and its condition as of July 1, 1932. The equipment in the ninety-six counties was valued and agreements reached with practically all the boards of supervisors as to the price to be paid for the same. This required a large amount of work. The personnel of the department has only increased by additional resident engineers and clerks.

In addition to an eightfold increase in the size of the highway system (from 5,000 to 45,000 miles), the Department and the road system became the focus of federal aid for providing relief to the unemployed. Virginia limited its relief program largely to putting the unemployed to work on the highways. The annual report for the year ending in June 1936 noted that more than four million hours of relief work had been provided.

The greatly expanded responsibility resulting from expansion of the system, depressed economic conditions, droughts, and several severe winters were not without their toll on the Department's comparatively small workforce, as indicated by the following statement in 1936 annual report.

Due to the great amount of extra work to take care of appropriations made by Congress, and other duties, the personnel of the Department have worked exceedingly hard. . . . In a number of instances, the Commission regrets to report, employees have gone to such extent that they have collapsed under the load they were carrying. Some have returned to their positions while others have been assigned duties not so exacting, with a number still out under medical care.

It is very likely that the action of North Carolina in 1931 influenced Virginia, and then West Virginia, to follow suit in 1932 and 1933. The success in these states, in addition to its small size, probably prompted Delaware to act in 1935.

Why did other states not take the same action? Any proof of a negative hypothesis is at best speculation. It would seem reasonable, however, to surmise that the economic conditions of the late 1920s and early 1930s that had demanded reduction of the local property tax burden had by mid-decade improved, thus removing pressure for drastic changes in a road system that was becoming better established and operated on the local level as automobile travel increased.

There is considerable evidence that the state system has served the citizens of Virginia well over the past fifty years. There is clearly consistency of standards statewide, so that travel across county lines is not equivalent to crossing into a "foreign county" in terms of road conditions, signing, etc. There likewise are no "off system" bridges, a category that nationally is a major component of the "bridge crisis." The diversity of climate, socioeconomic conditions, topography, and materials, coupled with the diversity of demands resulting from the responsibility for the entire system, places unique demands upon the Department.

Even though Virginia is different from forty-six other states, a sentence from a letter from Billy Rose, North Carolina's State Highway Administrator, discussing the background of his state's 1931 decision seems appropriate to Virginia. He wrote that "recommendations of 'outside' experts (i.e., the Brookings Institution) apparently led our General Assembly to conclude that the State should be responsible for the construction and maintenance of 'county roads.' We believe our North Carolina experience since 1931 has proved this was the 'right decision.'"

Funding the Infrastructure Through the Years: Part I

Howard H. Newlon, Jr.

[“Backsights” No. 95a: originally published in the *Bulletin,* March 1984]

In a statement opening three days of hearings last year before several committees of the U.S. House of Representatives concerned with research and technology for the nation’s transportation infrastructure, Representative Carney of New York stated, “It is clear that we have a difficult task ahead of us. How can we maintain the 3.9 million miles of streets and highways that we now have and continue to build more with the limited resources available? This is the challenge that we face.”

While much attention has recently been devoted to the needs and problems of our infrastructure, of which highways are a major part, the challenge identified by Congressman Carney is by no means a new one, as “Backsights” published over the past ten years have in part reflected. In preparing these “Backsights,” as well as in responding to requests for information for specific purposes, we have found no single readily available source tracing the evolution of methods for funding the highways of Virginia and the nation.

It is thus of some interest and value to describe and discuss some of the funding approaches and landmark events. The descriptions given here are not complete and may contain errors, particularly where “firsts” are cited. It is hoped, however, that people spotting errors in citations will bring them to the attention of the author.

As has been described in previous “Backsights,” Virginia’s highways were initially the responsibility of the Church Vestry and, after 1657, that of the County Court. Since what was needed initially was labor, rather than money, the instinctive recourse was to the British Common Law and specifically to the basic road law of 1555, which had placed responsibility for the construction and maintenance of roads upon the Parish, the smallest English administrative unit. The 1555 act required six days labor each year from each parishioner to help maintain the roads. After passage of our 1657 law, this requirement was placed upon each “titheable,” a male above the age of 16, either slave or free.

While the General Assembly authorized some ferries, toll collections, etc., the first colony-wide public levy for financing a road was authorized in 1691. This came as a military measure “for the better defense of the Country” against the incursion of the Iroquois into Virginia and Carolina. This road was to be laid out from above the line of settlements on the James to above the line of settlements on the Rappahannock and was to connect a line of forts constructed near the falls of the several rivers that it would cross. It is of interest to note that in 1956 the idea of linking peacetime road needs with those of defense was continued through creation of the System of Interstate and National Defense Highways.

In 1748, the General Assembly enacted the first specific and local road legislation of a nonmilitary nature, when it passed a statute to enable the court of Prince William County to

make a levy of tobacco on its inhabitants to raise sufficient funds for clearing a road from Pignut Mountain, in modern Fauquier County, to the Blue Ridge at Ashby's Gap. This act marked the beginning of special petitions from local groups for roads through the Blue Ridge and established the financing mechanism that persisted into the early nineteenth century.

The next, and perhaps most significant, action in Virginia was the creation of the Board of Public Works and the Internal Improvement Fund in 1816. The Board of Public Works was the first transportation commission in the United States and has been described in detail in previous "Backsights." The Internal Improvement Fund was created by the state's transferring stocks it owned in the few internal improvement companies that had been started by private entrepreneurs to the Board of Public Works. These included stock of the Dismal Swamp Canal, the James River Canal, the Appomattox Canal, the "Potowmac" Company, and the Little River Turnpike Company. These shares, together with those held by the state in the Bank of Virginia and the Farmers' Bank of Virginia, amounted to $1,462,140.61. The prospect of building up a sizeable fund from the interest on this amount of capital (about $115,000 per year) wasn't bright and, in fact, progress proved to be dismally slow.

Recognizing that the fund was small, the General Assembly authorized the Board to invest its funds in the purchase of stock of selected private companies engaged in public works. After the General Assembly granted a charter for a project and the company sold three-fifths of the stock, the Board was authorized to purchase any portion up to the remaining two-fifths and to represent the state's interest through its vote on the company's board of directors. During the mid-nineteenth century, as more projects were needed in the less densely populated areas of the Allegheny mountains, the Board was authorized to purchase up to three-fifths of the authorized stock. Virginia was apparently unique in this "mixed enterprise" approach that used both private and public funds.

A subsidiary method of financing roads and other internal improvements was the lottery, which was widely used through the United States to finance public ventures such as schools and transportation projects. In 1790, the General Assembly authorized a lottery "not to exceed four hundred pounds" for the purpose of "cutting a road from Rockfish Gap . . . to Nicholas's and Scott's landing on Fluvanna River [now the James]." The state supervised this and subsequent lotteries into the nineteenth century. The accompanying illustration shows a lottery ticket for the "Mountain Road" [location unknown], for which George Washington was the lottery manager. Washington was an avid participant in such lotteries.

> [*Image in original:* 1768 lottery ticket. *Caption:* This ticket for a "Mountain Road" lottery, managed by George Washington, serves as a reminder of past ways to raise money for road building.]

Beginning about 1830, anti-lottery forces began to influence legislation to abolish lotteries nationwide. In March 1833, Virginia's House of Delegates voted 97 to 2 to cease all lottery franchises on a date to be determined. The bill was adopted by both houses, but a Senate amendment sent it back to the House on the last day of the term, leaving no time for that body to act on it. In 1834, a proposal for abolition passed the lower house without dissent and was confirmed by the Senate. This act provided that after January 1, 1837, all such undertakings

would be illegal and subject to heavy fines. This ended officially-sanctioned lotteries for public works, although some were used subsequent to that period.

The coming of railroads in the 1820s heightened the competition for limited funds among proponents of canals, roads, and railroads and further diluted the Board's ability to fund a significant portion of the improvements needed. Most of the Board's resources were directed toward the improvement for navigation of the James River and several of the railroads. Roads were given the lowest priority and were almost completely the province of the private turnpike companies, which recovered costs and profit from tolls.

Where the population was sparse and revenues from tolls would not attract private investors, the state undertook projects financed completely from public funds. In these cases, the stock of turnpike companies was completely subscribed by public funds. A number of western turnpikes were funded in this manner, with the Northwestern and Southwestern being the longest and most expensive. Beginning with the incorporation of the former of these two in 1831, the state embarked upon a new era in which loans were floated for a number of projects. Bond financing of public works continued to be a matter of debate, but during the mid-1830s such borrowing increased. The financial panic of 1837 and the subsequent depression actually increased the pressure for further borrowing. While Virginia was able to meet her obligations, the improvement program was greatly curtailed. Some of this debt was to play a role, approximately a century later, during the debate over borrowing for road improvements that resulted in Virginia's first gasoline tax.

One result of the state's debt problem was that throughout the remainder of the nineteenth century, local roads (other than toll roads) were left to the counties. In 1880, the General Assembly empowered counties to levy taxes upon public service corporations. No attempt has been made to determine the beginning and use of such county levies on real estate and personal property to fund county road improvements, but these were the major source of funds for such projects until 1932, when the state assumed responsibility for local roads as discussed in the last two "Backsights." At the time of the state's assuming responsibility for county roads, about twenty percent of local real estate taxes were dedicated to road construction and maintenance.

Thus, throughout the nineteenth century, Virginia met the increasingly diverse and demanding needs for financing of its transportation infrastructure by a variety of means, the most innovative of which was its direct participation in the joint stock companies. The Civil War devastated the fiscal and physical bases of Virginia's transportation system, and with the twentieth century came the automobile, demanding increased attention to roads but offering another source of revenue to the state and the federal governments.

(To be continued)

Funding the Infrastructure Through the Years: Part II

Howard H. Newlon, Jr.

["Backsights" No. 95b: originally published in the *Bulletin,* April 1984]

Throughout the nineteenth century Virginia's transportation system was guided by the Board of Public Works. Monies from the Internal Improvements Fund, which were relatively small, were leveraged through participation with private entrepreneurs in joint-stock companies. In addition, the legislature authorized funds for projects, and beginning about mid-century borrowing was employed for large-scale projects and to supplement the Improvements Fund. The majority of transportation services required payment of tolls by the users.

Major emphasis was initially placed upon canals, particularly the James River, and subsequently the railroads. Roads usually received last priority. Between 1802 (Little River) and 1859 (Clear Fork, West Virginia) approximately 6,300 miles of turnpikes were authorized under the purview of the Board of Public Works. The longest was the 1834 Price's Turnpike and Cumberland Gap Road going west from Fincastle, while the shortest was the Fairfax Turnpike of 1813 connecting the Little River Turnpike and the Washington Bridge. The state's subscription for these projects averaged about 35 percent of the total cost, the lowest being a subscription of eight percent for the Little River Turnpike in 1802 and the highest 60 percent for the Valley Turnpike in 1838. Most were near the statutory limit of 40 percent. It is of interest that the Little River and Valley turnpikes were the state's most successful, the latter operating into the twentieth century. The Board of Public Works held representation on the boards of directors of the individual companies and shared in the profits or losses. Turnpikes in the more densely populated eastern Virginia were more attractive to private investors and generally more profitable, while those in the mountainous and developing western section required greater amounts of public funds, some being financed with public bonds.

The Civil War marked the end of the turnpike movement in Virginia, but the investment represented in them and other internal improvements occupied a major portion of the state's attention during the protracted litigation between Virginia and West Virginia following the latter's separation. Virginia's position was that the formation of West Virginia deprived Virginia of almost one-third of her territory and one-third of her population. At the beginning of the Civil War Virginia's state debt was approximately $33 million, almost all of which had been incurred for internal improvements. Virginia thus claimed that West Virginia owed one-third of the debt, or $11 million. West Virginia, on the other hand, cited figures to show that the state had invested an average of over $1,000 per mile in turnpikes in the Valley and eastern Virginia while investing only $60 per mile in the Trans-Allegheny. They felt that the West Virginians actually deserved significant credit for improvements that were now in Virginia. The case dragged on for years and was finally settled in 1911, with West Virginia paying less than one-fourth of the $11 million originally claimed by Virginia.

Beginning in 1866, the legislature enacted a number of laws regarding the disposition of abandoned turnpikes. This legislation was of necessity vague and largely empowered the counties to take over the turnpikes, if they found it advisable. The extent to which the counties

found such action advisable, even if they had funds to do the job, has not been studied in any detail.

The constitutional revision of 1902 abolished the Board of Public Works and transferred most of its responsibilities, including oversight of the joint-stock companies, to the newly created State Corporation Commission. Between 1902 and 1904, roads for the most part once again became the responsibility of the counties. The General Road Law of 1904 set forth in detail the duties and responsibilities of the counties with regard to roads.

In 1906 the General Assembly enacted two landmark bills. The first created the State Highway Commission and the second established the State Convict Road Force. Under this legislation county boards of supervisors were authorized to levy a county road tax on real and personal property, not to exceed forty cents per one hundred dollars of assessed value. Priority was to be given to building and repairing roads and bridges and the purchase of road-building equipment. Any funds not needed for building and repair could be used to purchase crushers, engines, etc., to produce stone for sale to the road districts in the county.

In addition to the county tax, the boards of supervisors were likewise authorized to levy a district road tax, also with a maximum value of forty cents per hundred dollars value. Voter approval was required for levies greater than thirty cents. In addition to these levies, counties were further authorized to borrow money for permanent road improvements, so long as the increase in the annual levy to retire the bonds did not exceed twenty cents. Such borrowing also required voter approval. The counties potentially had access to substantial funds for road work. That many boards availed themselves of these funds and had significant public support for the effort is confirmed by data in the First Annual Report of the State Highway Commissioner, which includes a summary of county expenditures for the year 1906 along with a listing of the county and district tax rates. Sixty-nine counties had either county or district road taxes and several had both. Twenty-five had total tax rates greater than twenty-five cents. The commissioner reported that during the year the counties had expended for roads $336,127.75 from county funds and $391,385.43 from district funds, for a total of more than $727,513.

The 1906 legislation provided $16,000 to cover salaries and operating expenses of the commissioner and his staff. State aid to the counties was initially provided in the form of labor from the State Convict Road Force and technical ser vices of the commissioner's staff. The convict labor could be furnished for projects conducted by the counties or put to contract. In the latter case the convict labor, figured at one dollar per day, exclusive of Sundays, could not exceed 40 percent of the contract cost. As it turned out, there were more requests for convict aid than there were available convicts.

Commissioner P. St. Julien Wilson reported that his initial emphasis had been upon visiting the counties and that during the year the counties, by means of bond issues, county and district appropriations and private subscription, had raised between $500,000 and $600,000 for permanent improvement of roads. As described in an earlier "Backsights," the first expenditures of the Highway Commission were for three 1,000 mile railroad tickets to permit Commissioner Wilson and his staff to make these visits. He further notes that the local funds were available

and projects were being delayed only until such time as state aid was available. The deficiency was in available convict labor and state funds to maintain them.

The General Assembly, in 1909, increased the funds available for maintenance of the department and the convict road force and for the first time made an appropriation of $250,000 to be used as state money aid for permanent road improvement. The cost of state aided work was to be borne 50 percent by the state and 50 percent by the county. Each county was eligible to receive matching funds in an amount not greater than its proportion of the total amounts of state taxes paid by the county into the treasury from real estate, personal property, income, and capitation taxes the previous year. Counties that requested state aid in the form of convict labor were not eligible to receive money aid.

In Virginia, at the close of 1916, 5,500 miles, or 10.3 percent of the total road mileage of the state, had been surfaced. Of this total, 4,463 miles had been improved by means of state aid combined with county funds. During that same year $542,524 of state funds were expended, along with $1,348,725 of local funds. With passage of the Federal Aid Road Act of 1916, federal funds for roads became available. While the act itself did not require that federal aid be spent upon designated-system routes, the Bureau of Public Roads requested that each state highway department designate a limited system to which it would confine its federal aid, providing for the genesis of Virginia's State Highway System that would be created in 1918.

Today's paved highways have come a long way since the muddy roads of yesterday.

Funding the Infrastructure Through the Years: Part III

Howard H. Newlon, Jr.

[“Backsights” No. 95c: originally published in the *Bulletin,* May 1984]

Passage of the Federal Aid Road Act of 1916 in many respects marked the beginning of the nation’s highway system as we know it today. The policy of the United States government favoring a tax-supported highway system was expressed in a provision that “all roads constructed under the provision of this Act shall be free from tolls of all kinds.” In addition, states were encouraged to designate a system of routes to which use of the federal aid would be confined. Under the act, completed projects were federally inspected and approved for reimbursement to the extent of 50 percent of the funds expended, not to exceed $10,000 per mile.

Responding to the provisions of the federal legislation and to the growth of the state’s road network that had occurred since the creation of the State Highway Commission in 1906, the Virginia General Assembly, in 1918, established “The State Highway System,” a system of mainline highways connecting cities, towns and courthouses.

Prior to 1918, the General Assembly made appropriations; from funds in the state treasury for road construction. By an act approved in 1918, a special tax of eight cents was imposed and ordered levied on every hundred dollars of assessed value of all real estate and tangible personal property, three-eighths (three cents) of which was to be applied to the construction or reconstruction of roads in the state highway system. By an act approved September 5, 1919, a special tax of seven cents, in addition to the previously imposed three cents, was levied, and these two taxes became known as the “mill tax,” a shortening of the economic term “millage tax.” Since 1906, counties had been authorized to levy taxes on real estate for highway work.

Roads in the state highway system were to be constructed and maintained exclusively by the state with state and federal funds. This system comprised about 4,000 miles on 28 routes. The “State-aid System” comprised the remaining improved roads and unimproved roads selected for improvement with the state money aid or convict labor apportioned as in the past. Convict labor was apportioned to the counties in order of their application but could not be secured for more than five years if other counties requesting this form of aid remained unsatisfied. In the case of state-aid roads, maintenance remained the responsibility of the county.

The 4,463 miles of roads improved prior to 1918 at state or local expense were included in either the state highway system or the state-aid system. All other roads were designated “County Roads” and were the responsibility of the county. However, when county roads were improved with proceeds of bond issues, the work had to be done in accordance with plans and specifications furnished by the state highway commissioner and under the immediate supervision of an engineer approved by him.

Men and mules supplied labor for building state roads in the early 1900s.

Throughout the period from 1906 until World War I, local property taxes were the largest source of revenue for road improvements and were supplemented by state and later federal appropriations from the same sources. The gradual improvements to roads encouraged the use of motor vehicles, and these came to be recognized as a source of revenue in themselves.

New York was the first state to require registration of motor vehicles and in 1901, the first year that a fee was charged, collected approximately $1,000 from its motorists.

In 1906, the same year that the State Highway Commission was established, the General Assembly in "An act to regulate the running of automobiles . . ." for the first time required the registration of vehicles. This act required that each motor vehicle owner pay a fee of $2 to the secretary of the Commonwealth for the "certificate of registration" and one license tag to be displayed on the rear of the vehicle. The certificate and tag were valid for the life of the vehicle. Of the $2 fee, 50 cents was distributed to the clerk to cover expenses of issuing the certificate and $1.50 to the treasurer of the city or county in which the permit was issued for expenses entailed in the enforcement of the provisions of the law.

In 1908, the General Assembly legislated that revenues from license tag fees were to be placed in a fund for the development and maintenance of highways in Virginia.

In 1910, the fees for licenses were changed from a flat $2 charge to fees based on manufacturers' rated horsepower as follows:

$5: 20 horsepower or less
$10: 20 to 45 horsepower
$25: over 45 horsepower
$2: motorcycle or motor bicycle
$1: duplicate or transfer

By 1911, 35 states were collecting such fees. The 1910 act also provided that the licenses were to be renewed annually. In 1916, the fees were changed to 40 cents per horsepower. This act also authorized cities and counties to sell their own license tags. The basis of the motor vehicle tax was changed from horsepower to vehicle weight in 1926.

By 1918, the number of motor vehicle licenses and registrations issued had risen to over 75,000, representing a potential income of approximately $680,000. One source reported that for fiscal year 1919, the net proceeds of the motor vehicle license fund, estimated at $475,000, were placed at the disposal of the State Highway Commission, along with $425,000 appropriated for the state highway system, $200,000 for support of the convict road force, $300,000 for aid to county highways, and $39,000 as a contingent fund for support of the Highway Department. This was the first year of the three-cent mill tax that was estimated to yield about $375,000 per year. These basic revenue sources continued with appropriate modifications until the early 1920s.

During the years following World War I, traffic, particularly trucks, increased significantly and pavements designed for lighter vehicles deteriorated dramatically as has been described in previous "Backsights." Inevitably, the best methods for raising additional revenues to meet the mounting needs were hotly debated. Federal excise taxes began to appear in 1917, but the proceeds were not dedicated to highway purposes. In 1919, Oregon became the first state to tax fuel for motor vehicles, and in 1921, nationwide state motor fuel taxes accounted for $5 million, while vehicle registration and licensing contributed $116 million.

The Federal Aid Act of 1921 created the "seven percentum system" through a provision requiring that all federal-aid funds be expended on a road system limited to 7 percent of the state's total highway mileage as of November 9, 1921. This interconnected system included two classes of highways: (1) primary or interstate highways comprising three-sevenths of the system and (2) secondary or intercounty highways comprising the remainder. No more than 60 percent of the federal funds apportioned was to be expended on the primary or interstate highways.

Throughout the early years of the 20th century, proposals to meet the growing needs by borrowing had been advanced. In Virginia, the Constitution of 1869 had prohibited any state debt except to meet casual deficits in the revenue, to redeem previous liabilities, or to protect the state in event of insurrection or war. The revised Constitution of 1902 contained the same restriction. In recognition of the increased needs and extensive national and local promotions by the Good Roads Association, a constitutional amendment permitting the legislature to issue bonds to build or repair roads was approved in 1920 by 61,000 votes.

When Congress enacted the Federal Aid Act of 1921 for only one year, debate intensified and it appeared that the legislature was ready to exercise its permissive borrowing power. This

debate culminated in 1923 and set the “pay-as-you-go” course that has guided Virginia’s program and ultimately the nation’s as well.

Funding the Infrastructure Through the Years: Part IV

Howard H. Newlon, Jr.

[“Backsights” No. 95d: originally published in the *Bulletin,* June 1984]

Early in 1923, Governor E. Lee Trinkle called an extra “roads” session of the General Assembly to resolve the issue of how the money needed for road construction and maintenance would be raised. The issue had been an important one in the 1921 election and the debate had intensified. The “pay-as-you-go men” led by Senator Harry F. Byrd, Sr., chairman of the Roads Committee of the Virginia Senate, advocated a 3 cents per gallon tax, 1 cent of which would go to the counties and 2 cents to the state. The “bond issue men” advocated a $50 million issue under the provision of the 1920 amendment. They were unable to muster sufficient votes to authorize this action but did manage to have the question put to a vote by the people. Because the legislature approved the Byrd gasoline tax, the question put to the people was, in effect, whether the revenues from the tax would go directly to road construction and maintenance on the “pay-as-you-go” basis or be used in part to amortize the bonds. The bond issue idea was rejected by a margin of about 46,000 votes.

It is of interest to note that one of the arguments advanced against borrowing was that Virginia owed about $22 million, a debt contracted before the Civil War chiefly for roads and canals. It was argued that few of these roads and, of course, none of the canals were still in service. The annual interest and debt retirement required about $700,000. Ironically, March 25, 1923, had marked the centennial of the issuance of the first Virginia bond that remained unpaid at that time. It was estimated that 167 years would elapse from the time the first bond was issued to the time the last bond would be repaid. While Virginia was the only state in the Union that had in 1860 a debt that it had not paid or repudiated, the failure to repudiate, while noble, had required considerable expenditure of public funds.

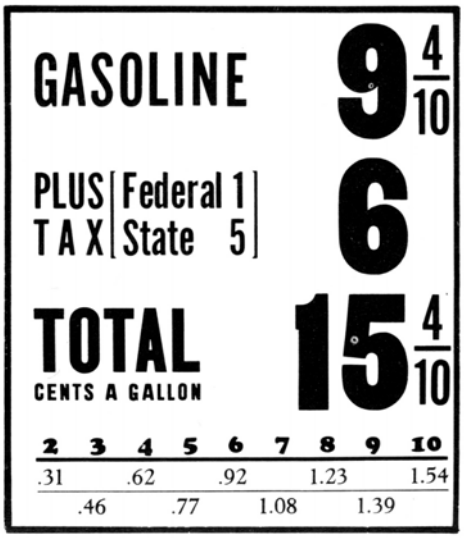
Rejection of the bond issue set the course for Virginia’s “pay-as-you-go” approach and established the state’s first gasoline tax, which ultimately would become the largest source of revenues for highway construction and maintenance. The 1923 act contained a “non-diversion” clause and provisions for refunds to users of boats, ships, aircraft, agricultural equipment, and state and municipal vehicles. The basic collection mechanism has undergone only minor changes during the last 60 years.

In 1926 the fuel tax was increased to 4½ cents per gallon, with 3 cents being allocated to the state and 1½ cents to those counties able to match state appropriations. In 1928 the tax was increased to 5 cents per gallon, and it remained at that level until 1946.

The gasoline tax gradually became the major source of state road revenues. In 1929, the first year all states and the District of Columbia levied the motor fuel tax, its yield exceeded that of registration fees. By 1931 it produced $538 million, nearly three times the 1926 yield and close to twice the income from registration fees. In 1923, when 37 states including Virginia

imposed a motor fuel tax, the average rate was under 2 cents per gallon. In 1929 the national average was approximately 3.7 cents.

While the states were developing funds to match federal aid and finance their non-federal roads, the federal government relied on allocations by Congress from the general fund for its highway revenues. Although highway excise taxes of one type or the other had been levied by the federal government since 1917, no part of these were dedicated to highways. The first federal gasoline tax of 1 cent per gallon became effective June 21, 1932, and was increased on June 17, 1933, to 1½ cents. The tax was reduced to 1 cent per gallon on January 1, 1934, where it remained until July 1, 1940, when it once again was raised to 1½ cents. The accompanying illustration is from this period and emphasizes that the tax was two-thirds of the price of the gasoline. The federal levy was raised to 2 cents per gallon on November 1, 1951, where it remained until in 1956, when it was increased to 3 cents per gallon. In 1959 the tax was raised to 4 cents where it remained until the "nickel gas tax" was enacted in 1983.



An early card showing gasoline price and tax.

It is of interest and somewhat surprising that the Highway Revenue Act of 1956, which created the Highway Trust Fund into which the proceeds of certain federal excise and motor fuel taxes were directed, was the first dedication of federal road-user taxes to highway uses.

Throughout the preceding decades, such taxes had become a part of the general revenues to be appropriated by Congress. A prime architect of the trust fund was U.S. Senator Harry F. Byrd, Sr., who some 30 years earlier had set Virginia on its "pay-as-you-go" course.

As the decade of the 1930s opened, the Great Depression triggered by the 1929 stock market crash was beginning to be felt in highway financing. The federal-aid program had been moving forward rapidly: the $273 million provided in 1931 was almost three times the 1921 figure. By 1931, taxes on motor vehicles and their inspection nationwide accounted for over 90 percent of all state-raised revenues for highways. The following year, 1932, when Virginia assumed responsibility for all roads in the Commonwealth, the property tax disappeared as a source of highway revenues.

The decade of national prosperity that had ended in 1929 had been preceded by a slow decline in the building industry, and by late summer of 1929, the building-related industries were curtailing production. Automobile sales began falling, but the industry, in a runaway boom, had produced almost 5.5 million vehicles, a record not equaled for 20 years. Auto production had fallen to 1.33 million in 1932. Nationally, unemployment increased from 1.5 million in 1929 to 12 million in 1932.

Despite the devastating impact of the Great Depression, road building held up much better than other kinds of industries. The states built up their road-building capability to the point where they could obligate $100 million of federal aid per year, a rate that exceeded congressional authorizations and was possible only because of the backlog of unexpended funds from the early years of the program. But by 1928 the backlog was exhausted and states began to cut back, and the decline was reflected in mileage completed in 1929 and 1930.

A number of federal public works programs were authorized to bolster the sagging economy. While these efforts were not limited to highways during the period between January and July 1931, the employment on federal-aided highways increased from about 31,000 to 155,000. The total employed on federal and state highway work was almost 400,000.

The early years of the Depression brought a precipitous drop in collections from income and property taxes. The resulting shortfall of revenue was felt with particular acuteness by counties and localities that depended upon property taxes for the support of schools and local roads.

Surprisingly, road-user revenues were remarkably stable. To millions of owners, their automobiles were no longer luxuries but necessities, and gasoline had a high priority in family budgets. The 1932 loss of $26.9 million per year in revenues from registrations and fees was more than made up by an increase of $55 million from gasoline taxes.

This large and stable revenue was an irresistible magnet for hard-pressed legislators. Diversions increased and the use of highway taxes for other purposes was hotly debated. Eventually Congress, in the Hayden-Cartwright Act of 1934, declared that after June 30, 1935, "federal aid for highway construction shall be extended to only those states that use at least the amounts now provided by law for such purposes in each state from state motor vehicle registration fees, licenses, gasoline taxes, and other special taxes on motor vehicle owners and operators. . . ." Only two states lost federal money because of this act, but the dedication of state road-user taxes to transportation purposes was established. It is interesting to note that Congress did not so restrict federal road-user taxes until 1956.

With the change of administration in 1933, the regular federal-aid authorization was suspended and the country embarked on a massive program of public works of which roads constituted a large part. In Virginia, the highway commissioner was responsible for administering the various federally aided public works programs.

Thus it can be seen from the series which this part concludes that funding Virginia's transportation infrastructure through the years has required continued attention and innovation.

The benefits of a well-maintained transportation system have elicited the public support necessary for such a massive effort. Today, the motor fuel tax is the largest source of revenue, but beginning with a levy of tobacco on the citizens of Prince William County in 1748, a variety of user fees and taxes, including property taxes, lotteries and joint public-private stock companies, have been used to provide funds for facilities dedicated to the safety, convenience and comfort of those who travel in Virginia.

Automobiles, Highways, and the Rise of the Historic Preservation Movement

Nathaniel Mason Pawlett

["Backsights" No. 96: originally published in the *Bulletin,* July 1984]

The current popularity of historic preservation in the United States has tended to obscure the story of the forces that gave rise to it and of the long years of struggle against "progress" on the one hand and apathy on the other. In fact, most people would rather contemplate the federal and state surveys completed and under way, the various grants and tax exemptions available, the National Register of Historic Places, the Historic American Engineering Record and the increasing scope of the activities of the National Trust for Historic Preservation. Preservation may now be said to have come of age in America. Very few people, however, are aware of the role of the automobile and good highways in providing the impetus for this.

Touring, itself, is, of course, an age-old phenomenon, whether of ruins, religious shrines, castles or country houses. The grand tour was considered the finishing of an English gentleman's education in the 18th century, while an English education and tour performed a somewhat analogous function for many a Virginian. This was usually only a side effect, however, for most of the sites visited usually did not exist solely for the purpose of being viewed and historically interpreted for the benefit of the visitors or tourists.

With the campaign to save and restore Washington's home, Mount Vernon, in the 1850s, there began a movement that would lead to the Williamsburg restoration in 1926 and culminate in the chartering of the National Trust in 1949. Now places would begin to exist solely for the edification of the visitor. And with the growing rail and water network, they would become more and more accessible, ultimately transforming what had previously been a genteel preoccupation into a mass cultural phenomenon. And, of course, the more accessible these sites became, the more of them there would be. The automobile and good roads would greatly accelerate this process.

While the influence of the automobile was at first negligible, by World War I it was beginning to be felt. The decade following the war produced many important changes in American life. Historic house museums and shrines proliferated in the United States. Usually the effort of local amateurs imbued with the notion of inculcating patriotism by saving and restoring these sites, historic places appealed to the tourist now regularly seen at points about the country. In their turn, these tourists turned many of these sites into viable enterprises through the money they spent at the site and at the nearby restaurants, tourists courts and stores. As a result, tourism is today one of Virginia's largest and most important industries.

[*Image in original:* 1917 photograph of a number of cars on a road. *Caption:* Already by 1917, automobiles were beginning to crowd America's highways.]

The revolutionary element which made all of this possible was the automobile and good roads to operate the contrivance upon. By 1926 its effect was apparent. Where in 1914 the

National Park System had recorded some 240,000 visitors, 12 years later the figure was about tenfold, 2,315,000. Total passenger vehicle registration in 1914 stood at 1,664,000; in 1926 Americans owned the astounding total of 19,267,000 cars. They also had a much better system of roads to drive them over, and drive them they did. They had both more time and more money to spend on cars and driving too, average weekly work hours having declined from 49.4 in 1914 to 45 in 1925 and weekly earnings having risen from $10.92 to $24.38. Indeed, by 1928 seven-and-a-half million people would be visiting the historic sites and monuments under the jurisdiction of the Department of the Interior each year.

Complementing further the burgeoning popularity of the automobile were the widely heralded Williamsburg restoration that began in 1926, probably the most important event in the development of historic preservation in the United States, and the developing interest of the federal government in historic preservation as exemplified by the New Deal programs of the 1930s. By 1940, also, events in Europe had begun to lend a new immediacy to the sites associated with development of our political ideals, and Americans began to view them with a new reverence which four years of warfare would only serve to increase.

In the years after World War II, as the influence of the automobile became still more pervasive and as it began to reshape the landscape with its requirement for better and better roads, it increasingly came to be viewed as an enemy of historic preservation. Finally in 1966 the National Historic Preservation Act, in its section 106, and Department of Transportation Act, in section 4(f), together superseded national significance as the sole criterion of historic importance by extending protection to historic resources of state and local significance. These two acts and subsequent regulations define the process for environmental review and comment by the relevant agencies at the earliest possible stages of planning and for the consideration of the potential impact of transportation projects on properties or structures that are on or are eligible for the National Register of Historic Places, if these projects involve, directly or indirectly, the use of federal funds or the issuance of federal permits. The federal agency had the final responsibility for regulating the impact of federal agency actions on National Register properties.

Thus, since 1966 the terms “106” and “4(f)” have become an important part of the transportation agency's lexicon. These years have seen innovative resolutions of conflicting needs for upgrading of facilities while preserving the fabric of the historic structure or district. There have, of course, been some significant losses as the processes have gradually been refined and have become better understood by all of the agencies involved.

On May 1, 1984, the U.S. Department of Transportation presented awards for outstanding public service to transportation and historic preservation. The ceremonies were held in the Old Post Office Building, in Washington, D.C., itself recently restored and converted to office and other commercial uses. The 11 projects recognized with awards included the Tennessee Department of Transportation’s program for selling, relocating, and preserving historic bridges no longer needed on the state's road system, the Washington State Department of Transportation’s restoration of the Indian Timothy Memorial Bridge, and the rehabilitation of Baltimore's Pennsylvania Station with special emphasis on the restoration of five stained-glass domes.

In presenting the awards, Transportation Secretary Elizabeth Hanford Dole said, “These projects demonstrate that we can resolve conflicts between preservation and modern transportation service in a sensitive and cost-effective way. We can and we must strike a balance that benefits all Americans, today and for generations to come.”

Thus the development of the automobile, transportation facilities and the historic preservation movement seem to be approaching a reconciliation. In some cases this relationship has been supportive while in others it has been adversarial. The recent program symbolizes the progress that has been made towards a reconciliation since the automobile first began to provide really convenient access to the physical reminders of our national and local heritage at the turn of the century.

Monuments Laid on the Ground

Howard H. Newlon, Jr.

["Backsights" No. 97: originally published in the *Bulletin*, August 1984]

In the *Charlottesville Daily Progress* of July 23, 1915, the following news item appeared:

> Albemarle County may share in a road development of tremendous importance. Thomas Fortune Ryan, multimillionaire traction king, wants an unbroken stretch of modem highway between his home in New York and his Virginia estate in Nelson County, and he is willing to pay half of the cost of completing such a roadway if the counties will pay the other half. That this offer will be made by Mr. Ryan there seems little doubt. Nor does there seem to be any great probability that it will be declined by the counties. Whether or not Albemarle is to benefit appears to be a question of routes.
>
> Two routes are under consideration, it is said. One of these is by way of Charlottesville, then on to Washington. The other is over the mountains into Augusta County, where the Valley turnpike would be tapped.
>
> No other rich man in the country has been more liberal with his money that Mr. Ryan perhaps. He has contributed to many big public undertakings and his generosity in his relations with his Virginia "neighbors" have gained for him a real popularity of the sort that few men enjoy. If he does enter into this great project with the counties he will be following the example of one or two other millionaires, notably the DuPonts, who have seen in road building an opportunity to render a real public service, while at the same time providing a permanent memorial to themselves.

So far as can be determined, the project never materialized and one might be tempted to dismiss the news item as a pipe dream. There was, however, a precedent offer that was carried through and there is little doubt that this was a serious one. The reason that it did not materialize can probably be understood is retrospect.

In order to understand the motivation for such an offer and to provide support for its credibility, it is necessary to review briefly some events of the late 19th and early 20th century.

During the last half of the 19th century, and particularly its last quarter, there were myriad inventions and technological innovations that in large measure shaped the way Americans were to live. This period has, with good reason, been called "America's Industrial Revolution," to differentiate it from the Industrial Revolution a century earlier that followed the commercial production of iron in England and Europe. These developments clearly set the United States on a course that would lead to its recognition as a world leader in industry and commerce. Those entrepreneurs whose business acumen and organizational skill permitted them to seize the opportunities presided over industrial empires and amassed the fortunes that we today associate with the names Rockefeller, Vanderbilt, and Carnegie. A major element in this revolution was transportation, notably the railroads which simultaneously demanded unprecedented amounts of steel and provided the means to economically transfer raw materials and finished goods. The beginning of this technological revolution began in the 1850s with the development of the Bessemer-Kelly process for making steel, with the installation of the first passenger elevator by Otis in New York and the discovery of petroleum in Pennsylvania. While

the Civil War occupied half of the 1860s, this period saw the joining of the rails in Utah and the development of the open-hearth process for producing steel that was more reliable than that derived from the Bessemer-Kelly process. Between 1876 and 1889, U.S. patents were granted for Bell's telephone, Edison's light bulb, the linotype and the motion pictures, and electrical power was produced commercially in New York. These innovations, important in themselves, were also interactive. Commercially available power permitted development of the electric elevator, which in turn permitted the evolution of skyscrapers requiring more steel, etc.

While names such as Rockefeller and Carnegie are well-known there were others who were at the time of equal status but generally less well-known. Among these was a native Virginian, Thomas Fortune Ryan, born in Nelson County, and left orphaned and penniless at 14. At the age of 23 he purchased a seat on the New York Stock Exchange, and when he died in 1928 at the age of 73, two full pages of the *New York Times* were devoted to his career and accomplishments, although he had been "partially retired" for 21 years. The headlines of the various articles reflect the diversity and magnitude of his accomplishments: "Ryan An Organizer of Vast Enterprises," "Ryan was a partner of King Leopold II, " "Associated for Years With the Leaders of Finance," "Helped to Launch Southern Railway," "A Power in Wall Street for Many Years," "Saved Equitable Life in 1905," "Born in Poverty, His Genius for Organization Made Him One of the Richest Men," "Quit 37 Corporations in 1906," and "Ryan a Figure in Traction Field." He was extolled as a patron of the arts and possessed "a remarkable collection of paintings and his Fifth Avenue home and another at Oak Ridge (his Nelson County estate)." He and his wife had "given lavishly to Roman Catholic churches and institutions." He was described as "having never cared for political office but keenly interested in politics." In 1904 he made one of the largest political contributions in history—$450,000 to the fund of Democratic presidential candidate Alton B. Parker. Needless to say he was a considerable political force nationally and in Virginia, where he maintained his voting residence.

[*Image in original:* Photograph of Thomas Fortune Ryan. *Caption:* Thomas Fortune Ryan.]

Despite the "Horatio Alger" nature of his life and the magnitude of his accomplishments and influence, no definitive biography of Ryan has been found and his name is still relatively obscure. For example, on a roadside historical marker adjacent to U.S. 29 in Nelson County commemorating Oak Ridge, the birthplace of William Cabell Rives, the last sentence reads "Oak Ridge was owned by Thomas Fortune Ryan."

Despite the lack of documented success of Ryan's proposal to create a first-class road between Nelson County and New York, it is obvious that the project was within his financial and organizational capability. As noted in the 1915 news account, T. Coleman DuPont of the "Dynasty on the Brandywine," a contemporary of Ryan's who shared many of his characteristics, had already "rendered a real public service, while at the same time providing a permanent memorial. . . . in the construction of a similar road in Delaware." This may have been a model for Ryan's proposal and is worthy of description.

T. Coleman DuPont, along with his cousins Alfred and Pierre, assumed leadership of the several parts of the vast DuPont Company in 1902 and ran it until 1911. During the period

between 1908 and 1911 "Coly," as he was called, was ill. Some critics skeptically described his illness as convenient since it prevented him from testifying in a prolonged antitrust case. In any event, in 1911 Coly emerged into public life again in his characteristically flamboyant way. According to one biographer, William H. A. Carr, "He startled everyone by proclaiming 'I am going to build a monument one hundred miles high and lay it on the ground.' What Coly actually proposed to build was a road—'the straightest, widest and best in the world'—from one end of the state to the other." Initially, he was able to acquire much of the right-of-way free, but speculators soon began to demand increasingly high prices for the land. Local Democratic political leaders began to question his public service motives as opposed to the prospective commercial exploitation of the roadside right-of-way. The fight moved to the legislature, and condemnation procedures, suits, etc., brought construction to a halt.

In 1917, however, the first 20-mile section of the road was presented to the state. Costs were inflating as a result of World War I, and there was a newly created State Highway Department to which the entire project was turned over. DuPont agreed to contribute up to $44,000 per mile for the rest of the road. In 1924 the highway was completed. DuPont, true to his word, had contributed nearly $4 million to the work. Today the DuPont Highway (U.S. 13 and 113), a monument "laid on the ground," connects the once-isolated Delmarva Peninsula with Wilmington.

It is highly probable that the problems encountered by DuPont in Delaware were not unlike those that would have confronted Ryan. In 1918, for example, Virginia's "State Highway System" was created, offering the prospect that a continuous, improved road would be built between Nelson County and Washington probably for closing the need for any further action by Ryan.

For whatever reason, Ryan's vision of a "monument laid on the ground" was not completed, but the brief newspaper account of 68 years ago testifies to the special place that Ryan held in one of the most dynamic periods of American history.

Appreciation is expressed to R. W. Gunn of the Research Council staff, who brought the newspaper article to my attention.—Howard Newlon, Jr.

Another Natural Genius: James Brindley

Nathaniel Mason Pawlett

["Backsights" No. 98: originally published in the *Bulletin,* September 1984]

The mention of a "natural genius" such as blind Jack Metcalf ("The Blind Roadbuilder," October 1983 *Bulletin)* or Claiborne Rice Mason ("Claibourne Rice Mason: Visionary Engineer," July-October 1982 *Bulletin* usually evokes the name of another, the illiterate James Brindley (1716-1772). Among the earliest English engineers, Brindley was the son of an idle, dissolute small farmer in Derbyshire who spent his hours in such amusements as bull-baiting. As with many another remarkable man, however, Brindley had a wise and prudent mother, and he was apprenticed at 17 to Abraham Bennett, an engineer.

[*Image in original:* Engraving showing Brindley. *Caption:* James Brindley.]

His performance as an apprentice was at first so poor that his master threatened to cancel his indenture and send him home. Soon, however, his talents became apparent in his cleverness in repairing machinery. The erection of a paper mill allowed him to further exercise his skill in devising some new arrangements and he made such an impression that he was placed in charge of his master's shop. Upon Bennett's death, Brindley concluded the business and, in 1742, moved from Macclesfield to the town of Leck. Shortly, he developed a good business in repairing old machinery and in setting up new equipment.

The Wedgwoods, then still small potters, next employed him to build flint mills for grinding the calcined flint they used for glazing their pottery. Brindley also gave some thought to the solution of one of the great problems of the time, that of clearing water from mines. He attempted to improve Newcomen's steam engine, and a patent was issued in 1758, but with only small success. Only when the steam engine was finally perfected as a power source would the draining of mines become possible. Meanwhile, he continued to introduce important improvements to the various pieces of machinery on which he had to work.

But Brinkley's reputation as an engineer rests upon his work in civil engineering, not mechanical, principally in his work as a canal builder with the famous Duke of Bridgewater. Called on by the Duke in 1759 for advice on the forming of a canal to cheaply transport coal from the Worsley mines to Manchester, he produced a strikingly original plan carrying the canal over the river Irwell on a great aqueduct. The idea for this canal had first been suggested to the Duke of Bridgewater by the Grand Canal of Languedoc, and it was to be the first important canal in England and the beginning of the construction of a system of inland navigation in England, an example which Virginians would attempt to emulate in the next century.

This was followed by the design and construction of the Bridgewater Canal which connected Manchester and Liverpool, and many others, often incorporating extremely ingenious solutions to the problems of traversing hills and valleys and crossing rivers. Over his lifetime he seems to have either laid out or constructed over 365 miles of canals, the most important being the Trent and Mersey, known as the Grand Trunk.

The foregoing would be remarkable achievements if the work of a trained engineer. What makes them doubly so is the fact that Brindley remained all his life fundamentally illiterate, unable to spell and barely able to write. Most of his work was done in his head without any written calculations or drawings of any kind. If particularly perplexed by a problem, or a series of them, his usual practice was to go to bed to think until he solved it. Doubtless, he, like Mason, would have been hard-pressed to explain his thought processes. Like Mason also, he was said to possess the most wonderful powers of observation and an almost intuitive perceptiveness which allowed him to immediately take in the inherent difficulties in an engineering project and then "see" the possible solutions, all before any survey had been made or estimates prepared. Such are the talents of a "natural genius."

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The Pine Stake, the Tombstone and the Bee Tree: The Story of the Orange County Colonial Roads Project

Ann Brush Miller

["Backsights" No. 99: originally published in the *Bulletin,* October 1984]

[NOTE: At the time this article was written, Ann Brush Miller, the author, was the Research Historian and Executive Director of the Orange County Historical Society.]

The Virginia Highway and Transportation Research Council's report *Early Roads Location: Key to Discovering Historic Resources?* and the classroom course on which it is based have been two of the greatest influences on the development of my professional career. These are also making a continuing contribution to the citizens of Orange County as they attempt to write their history and catalogue their historic and archaeological sites.

The report's title question was repeatedly answered in the affirmative while I was taking the course on "Architectural Patterns Along Virginia Road Traces" at the University of Virginia. The course itself was developed by the School of Architecture as an outgrowth of the Council's work to develop procedures for researching county road histories. It is generally designed as a graduate-level course in which potentially significant buildings remaining along the routes of early roads are inventoried and recorded. The output from this course is a series of architectural surveys, each covering an early route and describing the buildings along it. These reports are made available to the Department's environmental division.

It was as a student in this survey course that I first became familiar with the activities of the Research Council. After graduation, in my new position as research historian of the Orange County Historical Society, I became more fully aware of the problems encountered in accurately identifying the early transportation routes, migration patterns, land ownership, and archaeological and historic site locations in early Orange County, and of the further implications that the Council's activities might have for local history. Although the court records of Orange County are intact, research in the area is made difficult by the lack of detailed, accurate maps for the period prior to the middle of the 19th century. This difficulty is compounded by the fact that prior to 1745, Orange included not only a large portion of Piedmont Virginia but the Shenandoah Valley and, at least in theory, the regions west to the Mississippi River, with roads stretching as far as present-day Blacksburg. The court order books, in particular, are great repositories of information on early settlers and settlement, but are as yet only minimally indexed, with the consequence that much of this information remains relatively inaccessible.

A portion of the survey work that I had done for the above-mentioned course already involved Orange County. This repeatedly proved itself an invaluable historic resource, especially as no comprehensive survey of Orange County exists. It soon became apparent that another facet of the Council's activities had the potential for an impressive contribution to the available sources on Orange County. The Council's series *Historic Roads of Virginia* features transcriptions and full indices of road orders and other transportation-related court-order book entries. Volumes on the early road orders of Goochland, Louisa and Albemarle counties, all

compiled by Nathaniel Mason Pawlett, had already been published by the Council in order to encourage local historical organizations to consider undertaking similar works along the guidelines developed by the Council. Why not have the Orange County Historical Society undertake the first such project?

The Orange County Historical Society's active and forward-looking board of directors, headed by then-President Atwell W. Somerville, expressed enthusiasm at the prospect of such a project. A query to the Research Council was soon answered in the affirmative, and the project, to be christened the Orange County Colonial Roads Project, was set in motion under the procedures outlined in *A Guide to the Preparation of County Road Histories* by Nathaniel Mason Pawlett. The society agreed to fund the recording of the road orders by their research historian (myself), while the Council would be responsible for transcribing the tapes and printing the finished publication. The period 1734-1749, extending from the creation of Orange County to the loss of the majority of its territory, was agreed upon. An adjunct to another Council project, the road orders for Spotsylvania, the parent county of Orange, then being transcribed by Mr. Pawlett, the results of the two road-order studies could ultimately be interpolated to produce a comprehensive history of the area's early roads.

Historic structures, it became obvious as the project progressed, were not the only historic resources to be discovered by a study of early road orders and locations: contributions to archaeology, local history and genealogy also began to emerge. Road orders characteristically listed people living along a given road, usually in order of location. The identification of a road or portion of road, usually via topographical features and/or name survival, would also enable plotting of the residency/land ownership location for those people inhabiting the area—and many of those named in the road orders left virtually no other trace in the Orange County records. Conversely, it was also possible, once road and habitation place were identified, to begin rediscovering the locations of some long-forgotten but once very important landmarks. The Orange County road orders are full of references to such picturesquely named places as the Pine Stake, the Tombstone and the Bee Tree, along with numerous other equally obscure locations.

Initial analysis of the Orange and Spotsylvania road orders has already contributed to our knowledge of the early transportation systems of the area. The earliest roads within present-day Orange County were cleared prior to 1720. Predictably, they involved the northeastern section of the county (then a part of Essex County) around Alexander Spotswood's Germanna—an outpost of settlement as early as 1714, and, at the creation of Spotsylvania County in 1720-1721, the county seat. Ironically, the earliest records of county roads (collectively known as "road orders") for Spotsylvania County are for roads in what is now Orange County: an additional road leading to Germanna, and a road from Wilderness Run to Clark's Mountain. An examination of the Spotsylvania County records for 1721-1734 reveals that over half of the road orders for that period were for the area which is today Orange, Madison, Greene, Culpeper and Rappahannock counties—the frontier regions which, along with the wilderness west of the mountains, would be included in Orange County at its creation in 1734.

A detailed analysis of the land records and roads systems for the period when Orange was a giant county (stretching from the border with Spotsylvania to the Mississippi, with settlement as far west as West Virginia and the New River) is still in progress. As no 18th century maps for

the region survive, this road and land analysis will eventually enable a re-creation of the face of the county in the early and mid-18th century, including the location of early roads, bridges, homes and landmarks. Several tantalizing clues are already coming together to help complete the picture of the county at that time:

Deep cuts of old roadbeds, far more extensive than time, traffic or soil type would suggest they should be, point to prehistoric use, first as paths by large migratory animals, then Indian paths, and, finally, as county roads by settlers. Some of the most impressive examples in Orange County are located near Orange Springs in the Lahore area and on Tetley and Hampstead farms near Somerset. Early post-settlement roads thus far identified in Orange County include the so-called River Road from the Germanna/Flat Run area to the vicinity of the town of Orange, portions of Route 20 east of Orange, the Monrovia road, the old Orange-to-Gordonsville road, and the old Mountain Road (Scuffletown Road) from the Montford area through Greene County. Major sections of early roads have also been identified for nearby counties such as Madison (notably several roads from the Rapidan River to Graves' Mill, and portions of Routes 231 and 670), and Culpeper (the network of early roads between Lignum and Mount Pony, joining, roughly, into Route 29). Other roads in these counties, as well as in Rappahannock County and the Shenandoah Valley, are still being identified. This is by no means a simple task—the early records describe well over 100 distinct roads or portions of roads, and, of course, numerous changes were made and other roads were added over the years.

[*Image in original:* Route 669, Orange County. *Caption:* Deep cutbanks alongside Route 669 near Monrovia (in southeastern Orange County).]

The identification and mapping of the early county transportation system, and of the landmarks, homes and place names described in pertinent court records, make up a continuing project sponsored by the Orange County Historical Society. The early patterns of transportation and settlement will ultimately provide the data from which an image of that long-forgotten county geography can be made. We are, at present, closing in on the solutions to many mysteries, including, among others, the locations of the Pine Stake, the Tombstone and the Bee Tree.

A Backsight on "Backsights"

Howard H. Newlon, Jr., and Nathaniel Mason Pawlett

["Backsights" No. 100: originally published in the *Bulletin*, November 1984]

The December 1972 issue of the Department's *Bulletin* carried an article under the title "Backsights," with the editorial note that "This is the first in a series of historical articles by Mr. Newlon and other contributors that the *Bulletin* hopes to print, more or less regularly, during the next several months." Since the present article is the 100th in this series and completes the 11th year of publication, it seems appropriate to take a "Backsight on 'Backsights.'"

Since the mid-1960s, historic significance has become increasingly important in the environmental-review process and rather mundane elements, such as bridges, have to be considered in ways previously reserved for stately mansions and sites associated with persons of well-documented fame in the history of Virginia and the nation. As opposed to the extensive documentation of famous persons in Virginia's political, military and social history, comparatively little has been published concerning events and individuals responsible for its roads, bridges and other developments in transportation. Such information provides a context in which to judge the historic significance of sites and structures using the approach developed by the Research Council for evaluating bridges and structures associated with early roads.

Two series of writings have served as models for "Backsights." One comprises brief articles published over a number of years in the magazine *American Highways* under the authorship of "The Old Road Builder." In 1953, these were compiled and published by the American Association of State Highway Officials under the title *Historic American Highways*, and the heretofore anonymous author was identified as Albert C. Rose, highway engineer and historian of the Bureau of Public Roads. This volume, which was reissued in 1976 under the title *Historic American Roads* by Crown Publishers, Inc., contains over 100 reproductions of paintings by Carl Rakeman as part of a diorama exhibited at the New York World's Fair in 1940. A number of these illustrations depicted scenes in Virginia and were used as illustration in early "Backsights."

The second model consisted of a series of articles on the history of civil engineering, authored by Neal FitzSimons, chairman of the History and Heritage Committee of the American Society of Civil Engineers, that appeared in that organization's magazine *Civil Engineering* under the title "Benchmarks." The term "backsights," like "benchmarks," derives from one of the oldest and most important of the engineer's activities—surveying, a task a famous Virginian, George Washington, is seen engaged upon in the accompanying illustration. In surveying, one looks back to an established point as a reference from which to extend or project ahead. In the same sense we learn, and in some cases, take inspiration and courage from the accomplishments of those who have gone before us.

From the outset of this series, the favorable response from both within and without the Department has been gratifying and somewhat surprising. Perhaps this response simply

confirms the influence and growing appreciation of transportation as a major function in the way we live.

In addition to providing a context in which to evaluate the significance of elements of Virginia's transportation system, individual articles have proved useful in responding to numerous requests that come to the Department from local historians, genealogists, and students who wish to identify old roads or locations. Apparently the same kind of response greeted Albert Rose's articles. As he notes in his foreword, "Throughout the ensuing years there has been a steady progression of requests . . . from persons and agencies too numerous to mention."

Adding to this general interest over the last decade has been the increased awareness of the major influence of technology on our history, and organizations such as the Society for Industrial Archaeology and the Society for the History of Technology are flourishing, as are a variety of industrial museums.

Over the years, many people have asked, "Where do you get the ideas and information?" The answer is "From everywhere." Often in responding to a request, or in attending to matters incidental to other activities, some reference or event will appear interesting, and subsequently other references might surface and sufficient information accumulate to warrant an article. The point is that the information is in a variety of places, and usually is peripheral or secondary to another topic. In a sense, the ideas result from reading or researching history "with blinders," strictly from the perspective of technological and transportation developments.

For example, most people have heard of Tom Paine and identify him as a political pamphleteer active in the struggle for American independence. His early interest in iron bridges is usually footnoted in references to his life, but this interest suggested our article entitled "Citizen Tom Paine: Bridge Engineer." People in the Department often bring to our attention curious or old items, documents maps, etc., that otherwise might have been discarded.

In looking back over the subjects and individuals covered in the 11 years of "Backsights" one has to be impressed and awed by the accomplishments of our forebears and the great impact that their handiwork has had on the transportation system that many take for granted. The individuals on whom profiles were prepared range from Claudius Crozet, educated at the Ecole Polytechnique in Paris and a member of Napoleon's staff, to Claibourne Rice Mason, the illiterate genius who was one of Virginia's legendary figures in the construction of roads, bridges, tunnels and railroads during the 19th century.

Among the survivors of America's industrial revolution over the last half of the 19th century are numerous metal truss bridges that have witnessed the evolution from the carriage to railroads to the automobile. This period has provided a large number of topics; for "Backsights," including automobile manufacture and "boom" towns in Virginia as well as specific projects and events. A special case of the worldwide nature of industrialization or technology was chronicled in "The Eiffel Tower, the Statue of Liberty, and the Nokesville Bridge" which documented that the Keystone Bridge Company was erecting the framework of the statue designed by Gustave Eiffel concurrently with its construction of a metal truss railroad overpass near Nokesville.

The overwhelming dominance of the railroads during this period has provided subjects for numerous articles, including one on the standardizing of time in the United States and another on changing the gage of 15,000 miles of track in 11 Southeastern States in a single day to conform to the gage on the roads in the rest of the country. Certainly, the latter ranks as one of the single most amazing feats in the history of U.S. transportation.

As they have accumulated, the "Backsights" have become useful in responding to inquiries or providing documentation for other studies. However identifying the issue of the *Bulletin* in which a specific article appeared became a problem and led to the preparation of an annotated bibliography covering the first 89 articles. This was issued in 1983.

Rose noted in the foreword to *Historic American Highways* the book had been compiled to make the information available to a wider circle of highway specialists and the general public, and to insure its survival as a permanent record. During the last 11 years, similar suggestions have been made concerning "Backsights." While the *Bulletin* is widely circulated, it is by nature a temporal publication. Plans are nearing completion for issuance of a compilation of the first 43 "Backsights" in booklet form. *[NOTE: This volume was published in 1985.]* The accompanying illustration will appear on the cover of that volume. It is hoped other such compilations will follow**.**

Engraving of George Washington surveying (from Washington Irving's biography of him). The cover of a booklet containing the first 43 "Backsights" will bear this illustration of George Washington conducting a survey, one of the oldest and most important engineering tasks.

It often has been said that "history is the story of transportation." Despite this, the history of transportation in Virginia remains largely unwritten. It was to remedy this deficiency. as well as to inform Virginia Department of Highways and Transportation personnel of their history, that the "Backsights" series was conceived and has been continued.

It is our hope that these "Backsights" covering individuals, events, structures, and the evolution of our organization and system have helped to illuminate the special heritage of which we are a part. The realization that we are of a long lineage of predecessors charged with the

responsibility for one of the most crucial elements of our state and nation's economic and social survival should strengthen our sense of pride, self-worth and purpose.

In his speech made famous by his plea for liberty or death, Patrick Henry observed: "I have but one lamp by which my feet are guided, and that is the lamp of experience. I know of no way of judging the future but by the past." "Backsights" remind us that our forebears faced many problems of funding, competing demands and technical issues even as we do now and will continue to face in the future. As we look back, they provide for us heritage and a challenging point of reference from which we can approach the future dedicated to providing an equally impressive record to whomever will be looking back from the 21st century.

Roads that Lay Lightly on the Land

Howard H. Newlon, Jr.

["Backsights" No. 101: originally published in the *Bulletin*, December 1984]

Within the boundaries of the Commonwealth are four roads designated as parkways within the federal system. Although various definitions are used, a parkway differs from a park road in that the park road is within or leads to a national park or monument and is intended primarily to provide access to the national park without disturbing its beauty. On the other hand, the parkway was developed as a highway primarily for use by through traffic, excluding commercial vehicles, with full or partially controlled access, and usually located either within a park or a park-like setting. The four Virginia roads have such characteristics, and the circumstances under which they were developed would warrant their being classified under either of the two designations.

The oldest of these roads, the Mount Vernon Memorial Parkway constructed in connection with the observance of the celebration of the 200th anniversary of the birth of George Washington in 1932, and the youngest, the Colonial Parkway, constructed to connect Yorktown, Jamestown Island and Williamsburg as part of the 350th anniversary celebration of the founding of Jamestown in the 1950s, owe their existence to the historic significance of the national monuments with which they are associated.

On the other hand, the Skyline Drive, constructed between 1930 and 1939, and the Blue Ridge Parkway, begun in 1935, to connect the Shenandoah and Great Smoky Mountains National Parks, were developed to provide access to scenic and recreational areas. As the three oldest of these roads approach the 50th anniversaries of their construction, they assume historic significance in their own rights and taken together are important examples of the federal role in the development of recreational, scenic and historic parkways which have been a vital element in Virginia's attractiveness to the millions of tourists that have visited the Commonwealth.

Each of these roads involved in varying degrees vision, the application of new concepts, controversy and persistence by a variety of dedicated professionals and citizens. Their conception and completion were greatly facilitated by special circumstances as diverse as the emergence of the automobile which complemented the increased time available for and interest in recreation travel, recognition of the benefits of national parks as a retreat from the growing urbanization, and the economic depression that made available large numbers of workers for the construction of such public works projects.

In a sense these projects represented the initial efforts to meet requirements for travel in a way sensitive to the environment with roads that "lay lightly upon the land," a characterization attributed to General Hiram M. Chittenden, who was associated with the Yellowstone National Park from 1891 to 1893 and from 1899 to 1906, and who is credited with having a major influence on the development of the Yellowstone Park loop road system.

Among the many factors that influenced these projects, the automobile was obviously paramount, but the growth of the National Park Service and renewed interest in historic places epitomized by the developments at Colonial Williamsburg provided an attractive opportunity for automobile travel. The relationship among the automobile, tourism and historic preservation was described in an earlier "Backsights" (July 1984).

During the earliest years of the automobile it was largely a rich man's toy, and one of its major uses was for recreational tours outside of the cities. Simultaneously, its durability was being improved and demonstrated on the racing circuit. By 1906 the period of trial was over and Frank A. Munsey wrote in *Munsey's Magazine* "the uncertain period of the automobile is past. It is no longer a theme for jokers, and rarely do we hear the derisive expression, 'Get a horse!'"

Throughout the early years, a variety of virtues in addition to its primary function as a mode of travel were ascribed to the automobile. In his book *America Adopts the Automobile, 1895-1910,* James J. Flink elaborates on a number of these, including this 1903 quote by Munsey: "It is the greatest health giving invention of a thousand years. The cubic feet of fresh air that are literally forced into one while automobiling rehabilitate wornout nerves and drive out worry, insomnia, and indigestion. It will renew the life and youth of overworked man or woman . . ."

The writers of *Outlook* echoed a similar theme, "After a day of hard mental effort in study or office, it is better than any medicine to push forward the lever and flyaway with the ever faithful and obedient automobile . . . the restful pleasure and exhilaration that come as we speed away with our unwearying servant are the best cure for the tired nerves."

While today's commuter very seldom describes his trips to and from the office in such terms but turns to jogging and aerobics for similar benefits, the fact remains that these early views embodied one element that found rebirth in the development of scenic and recreational roads.

Another major element was the expansion of state and local parks that culminated in the creation of the National Park System in 1933 under the administration of the National Park Service that had been created in 1916. When President Roosevelt signed the executive order establishing the national park system, its various components were, including the National Capital Parks in the District of Columbia, 21 national memorials, national cemeteries, battlefield sites, etc., in all a total of 137 areas.

In addition to the federal activities, several states were moving in complementary ways. In the article "Will Carson and the Virginia Conservation Commission, 1926-1934," published in the October 1984 issue of the *Virginia Magazine of History and Biography,* John F. Horan, Jr., details the leadership and capacity for innovation displayed by Virginia in providing parks and directing national and international attention to the unique historical attractions in the Commonwealth.

In his inaugural address, Governor Byrd placed major emphasis on the Conservation and Development Commission which would "consider Statewide policies for the development of our

latent resources." Carson, who Byrd chose to head the Commission, promoted a policy designed to bring progress and prosperity to the Old Dominion through a course that justified the seemingly contradictory title of the commission. He proposed to develop Virginia by conserving it—to use the state's scenic and historic wonders to attract tourists and, indirectly, industry. While his tenure was not without controversy, and Horan notes that the results are difficult to assess precisely, by 1934 Virginia had garnered $55 million annually from the tourist trade, an amount that rose to $73 million in 1935 and which equaled the state's industrial payroll. Among the major elements of the commission's basis for promoting tourism was an ambitious plan to make Virginia a recreational mecca. The largest undertaking was the creation of the Shenandoah National Park. This project had been in motion for several years and included a "Buy-An-Acre" campaign that had raised about $1.2 million, but under Carson's leadership this effort was emphasized and the park was reduced to a more economically realistic size, with the result that the Shenandoah National Park was formally established in 1935. This park provided the location for the Skyline Drive and, later, the justification for the Blue Ridge Parkway.

In 1923, the director of the National Park Service, Stephen Mather, had observed that all but one of the major parks were west of the Mississippi River, while two-thirds of the population lived east of it. While the western parks had been created out of the public domain, the only extensive land in public ownership in the east was in forest reserves, and this was interrupted by significant areas of private ownership, and, of course, presented difficult road problems.

While the national and local efforts were proceeding without formal coordination, there were people with a vision of a grander plan. The accompanying illustration shows a map in the Virginia State Library for an "Eastern National Park-to-Park Highway" that was agreed upon at a conference held in Washington, D.C., on April 4, 1931, and attended by representatives from the states under the auspices of the Eastern National Park-to-Park Highway Association. At the time this map was prepared, neither the Shenandoah nor Great Smoky Mountains Parks, subsequently the termini of the Blue Ridge Parkway, were secure, as indicated by their designations as "projects." The importance of the Skyline Drive, which was in its infancy, was not recognized. Despite the fact that this plan was not carried to fruition, it did in later years serve as an important basis for the Blue Ridge Parkway.

> [*Image in original:* Map of the Eastern National Park-to-Park Highway (Virginia State Library [now the Library of Virginia]). *Caption:* In 1931, an "Eastern National Park-to-Park Highway" was conceived as a way to link national parks established or anticipated in the states of Virginia, West Virginia, Kentucky, Tennessee, and North Carolina. Although the plan was not carried out, it later served as an important basis for the Blue Ridge Parkway.]

Despite the vision that prompted the planning for such undertakings and the support for them, they might not have been accomplished had it not been for the Great Depression and the supplies of manpower and funds that became available at precisely the right time, particularly resources of the Civilian Conservation Corps. Because of the plans that had been developed by Virginia's Conservation and Development Commission, it was able to utilize manpower and funds as rapidly as they were made available. In fact, soon after establishment of the CCC in 1933, Virginia was utilizing 4,500 men, and Carson noted "the jealousy of the development that

has been done in Virginia by other states and demands . . . that we be limited in our expenditures, etc."

Obviously, these state and national parks and sites were of little value without access roads. At the same time, these roads would need to "lay lightly on the land." These roads have their own stories and these will be covered in subsequent installments. The words used by Wallace Nutting in *Virginia Beautiful* to describe the efforts of Carson are just as applicable to these early parkways. "Sometimes we hesitate to provide for enough in the future . . . But fifty years from now the grandchildren will bless us for every square mile thus forever secured."

Roads that Lay Lightly on the Land: The Mount Vernon Memorial Parkway

Howard H. Newlon, Jr.

["Backsights" No. 102: originally published in the *Bulletin*, January/February 1985]

During the 19th century, as a folk hero George Washington was accorded an esteem that has probably not been equaled in our nation's history. Most authorities agree that the modern preservation movement in America began with the formation of the Mount Vernon Ladies' Association, chartered by the Virginia General Assembly in 1856, and to its efforts under the leadership of Ann Pamela Cunningham to preserve and protect the home and estate of our first president.

The cornerstone of the Washington Monument had been laid by President Polk on July 4, 1847. In December 1853, just three days after Virginia Governor Joseph Johnson first raised the subject of Mount Vernon in the Virginia General Assembly, Miss Cunningham, a 38-year-old South Carolinian of frail health, placed an appeal in the *Charleston Mercury*. Directed to the "ladies of the South," her appeal outlined the debt the nation owed its first president and pleaded against desecration of Mount Vernon by speculators. Her appeal was signed, with 19th century modesty, "A Southern Matron."

During the early years of her efforts, which became her life's work, several significant and unexpected impediments arose. To her surprise she found that the Washington family, headed by John A. Washington, was not sympathetic to the effort. In 1851, in response to separate inquiries from the U.S. Army Board and the General Assembly, John Washington had set a price of $200,000 on the property. He was criticized by many because his asking price was double the figure he had established in response to a similar request only five years earlier. For several years, the Virginia General Assembly, the federal government, and the Mount Vernon Ladies' Association of the Union, as it was formally designated, pursued efforts to secure title to Mount Vernon, but with only modest efforts at coordination. While the legislature had chartered the association in 1856 and one of the leading champions of the preservation was Virginia's Governor Johnson, the legislature had been careful in offering to accept title to the property without helping to raise the purchase money. In 1858 the legislature for the last time considered the question of saving Mount Vernon. The charter of the ladies' association was modified to permit it to own the property and the effort was left in the laps of the women of the nation.

Although the incorporation of the word "Union" was emphasized as the clouds of war approached, Miss Cunningham faced discord among the regionals. By the eve of the Civil War, the Washington Monument had risen to over 150 feet when the money for its construction ran out. Miss Cunningham had, through amazing organizational skill, persuasion, energy and dedication, made an ally of the Washington family and established working committees in each state.

The war hampered the efforts to preserve Mount Vernon, since Miss Cunningham was barred from traveling between her home in South Carolina and the Potomac plantation. In

addition, the federal government confiscated the association's steamboat, the only means by which tourists could reach the mansion, and thus deprived the association of its sole source of income. The limited staff at Mount Vernon even had difficulty getting back and forth from Alexandria with provisions for the people at the farm.

The decade following the Civil War was marked by consolidation and improvement. In 1869, Congress passed legislation awarding the association $7,000 as wartime restitution that permitted badly needed repairs and, in effect, virtually assured the realization of Miss Cunningham's dream.

Efforts to complete the Washington Monument were resumed, and the marble obelisk was officially dedicated on Feb. 22, 1885, more than a century after its authorization by the Continental Congress.

Perhaps encouraged by the success of the two efforts to honor Washington, in 1886 a group of public-spirited citizens conceived of a highway leading to Mount Vernon, and in 1888 the Virginia Legislature incorporated the Mount Vernon Avenue Association. Just as its predecessor had been reluctant to commit funds, the General Assembly chose a novel way of providing financial support for the project. In a joint resolution, passed simultaneously with the incorporating act, the legislature transferred to the association the Commonwealth's claim of $120,000 against the U.S. government, which stemmed from a loan made by the state in 1790 to be used toward the erection of the public buildings at the permanent seat of the U.S. government. The loan had been paid in person to President George Washington and disbursed under his supervision. The General Assembly empowered the association to collect the money claimed, with interest, from the federal government and to use the money to construct the proposed memorial avenue to Mount Vernon.

Obviously, this was not a very secure financial base, and no tangible progress was made until 1928. The impetus toward construction of the roadway was the establishment, by Congress in December 1924, of the United States Commission for the Celebration of the 200th Anniversary of the Birth of George Washington, which was to occur in 1932. In May 1928, Congress passed legislation directing the commission, acting through the Department of Agriculture, to construct a suitable memorial highway to connect Mount Vernon and the southern end of the Arlington Memorial Bridge. The objective was to have the Mount Vernon Memorial Parkway completed in time for the bicentennial celebration.

The Bureau of Public Roads, which was charged with the work, had earlier made reconnaissance surveys of two possible routes, one an inland route and the other along the shore of the Potomac River. The river route was ultimately approved by the Bicentennial Commission because of its greater scenic and historical advantage, as well as the potential it afforded for creation of park areas between the roadway and the river.

The development of the project was timely in that it provided the Bureau of Public Roads with an opportunity to further develop the parkway design concept. It was at about this time that Robert Moses, in New York, was planning, promoting and accomplishing that city's

monumental network of truck-free, limited-access, landscaped roadways that he referred to as "ribbon parks."

In 1930 Congress enlarged the concept of the Mount Vernon Memorial Parkway to provide for a parkway along the shores of the Potomac to Great Falls, with the provision that it incorporate the section already under construction. Coincident with this was the designation of a part of this road as the George Washington Memorial Parkway.

The Mount Vernon Memorial Parkway was completed on schedule, and it was dedicated at a special ceremony in conjunction with the annual meeting of the American Association of State Highway Officials in 1932. This occasion afforded highway engineers from across the nation an opportunity to see first hand a full development of the parkway concept. This undoubtedly had a significant influence on the extension of the concept, but it also represented the culmination of almost a century of efforts to honor the "Father of Our Country." It also provided one of the links envisioned in the "Eastern National Park-to-Park Highway" illustrated in the first installment of this article. Meanwhile, about 40 miles to the west, another, much more challenging scenic road was being constructed: the Skyline Drive.

[*Image in original:* Early photograph showing cars on the Mount Vernon Memorial Parkway. *Caption:* The Mount Vernon Memorial Parkway was opened in 1932 as a memorial avenue between George Washington's home overlooking the Potomac River and the nation's capital.]

(To be continued)

Roads that Lay Lightly on the Land: The Skyline Drive

Howard H. Newlon, Jr.

["Backsights" No. 103: originally published in the *Bulletin*, March 1985]

The Skyline Drive is a recreational highway clinging near the crest of the Blue Ridge Mountains for a distance of approximately 97 miles, all within the boundaries of the Shenandoah National Park. Its northern terminus is at Front Royal and its southern terminus is at Jarman's Gap (formerly Wood's Gap) about 8.5 miles north of U.S. 250 and I-64 on Afton Mountain. The section of road south of Jarman's Gap to Route 250 is part of the Blue Ridge Parkway but is often erroneously thought to be part of the drive. The elevation varies from about 600 feet at Front Royal to 3,390 feet on the side of Hogback Mountain, about seven miles southward.

As opposed to the Mount Vernon (George Washington) Memorial and the Colonial parkways, which traverse sylvan settings to connect historic sites, the Skyline Drive and the Blue Ridge Parkway are park roads lying within or connecting national parks.

The genesis of the Skyline Drive is immediately connected to the creation of the Shenandoah National Park, the first major national park east of the Mississippi River. The period between 1923, when Stephen Mather pointed out the absence of national parks in the east, and 1935, when the Shenandoah National Park was created, was marked by conflict, controversy, and frustration that were countered by dedication and leadership on the part of William Carson, Governor Byrd, and various federa1 officials.

A key factor in the establishment of the park, and ultimately Skyline Drive, was the earlier establishment of President Hoover's fishing camp on the Rapidan River in Madison County. Carson had convinced the president that the Rapidan River rivaled his favorite trout stream in California, but was only 100 miles from Washington. The news media followed the clearing of roads, the laying of communications lines, and construction of the house. All of this activity came to a climax on Aug. 17, 1929, with a gala celebration in which Governor Byrd arrived in a blimp and President Hoover extolled the beautiful scenery and Virginia's hospitality in a nationwide broadcast. Hoover and British Prime Minister Ramsey McDonald met there in the autumn of 1929. But on "Black Tuesday," Oct. 29, the stock market crashed and signaled the coming end of President Hoover's residence in the White House and in his mountain retreat.

In addition to focusing attention on the potential of the region for recreation, the retreat required that for presidential security a road be built from the camp to Skyland and then northward to intersect with the Lee Highway, now U.S. 211, at Thornton Gap. This was done in the summer of 1931, and because this area was greatly impacted by depression and drought, Congress specified the use of drought relief funds and local labor for the construction.

The first section of the drive was planned late in 1930 with the preliminary surveys starting in January 1931. Because the work had to be under contract by the end of the fiscal year on June 30, there were only five months to make surveys, prepare plans, and let to contract

approximately 40 miles of highway. Records show that approximately 25 percent of this time was lost in the field due to snow, fog and rain. Bids for the first section were opened on June 25, 1931, and work began on July 21, 1931. Plans were quickly made to continue the road from Skyland south to U.S. 33 at Swift Run Gap, which constituted the second section. In the last days of the Hoover administration, Congress approved construction of the northern extension from Thornton Gap to Front Royal.

A detailed summary of the contracts, construction details, and personnel involved was published by Baxter Smith in six articles that appeared in the *Virginia Road Builder* between November 1945 and October 1946. These articles emphasize the magnitude of the undertaking.

By the middle of August 1934 there was considerable public clamor to get on the drive and the authorities decided to open the facility on Sept. 15, 1934, without priming the roadway, recognizing that the public who had followed the lengthy acquisition and fund raising efforts were becoming impatient, but on Aug. 29, after further consideration, it was decided to prime the roadway from Thornton's Gap to Big Meadows. This meant arranging for the delivery of 80,000 gallons of asphalt and assembling equipment necessary to treat approximately 20 miles of road (including overlooks), all within a period of 17 calendar days. Application of the prime began on Sept. 10 and was completed on Sept. 15, and this segment was immediately overrun by traffic. During the next six weeks, 30,000 people visited the drive. The excitement generated by the opening speeded the construction of subsequent parts.

[*Image in original:* 1930s photograph of cars on the Skyline Drive. *Caption:* Sunday cruises on the Skyline Drive quickly became a favorite pastime shortly after the mountain highway's opening in the 1930s.]

By the time the Shenandoah National Park was dedicated on July 3, 1936, two-thirds of the Skyline Drive had been completed. President Franklin Roosevelt, who spoke at the ceremony, was no stranger to the area, having previously visited Hoover's fishing camp. During his address, the president announced the proposal for an extension of the Drive to the Great Smoky Mountains National Park, a proposal that ultimately would be realized in the building of the Blue Ridge Parkway.

It has been estimated that the grading and placing the base course between the years 1931 and 1938 provided approximately 2.1 million man-hours of employment and involved quantities of materials and construction difficulties enormous for the time. The availability of the Drought Relief Fund, establishment of the Civilian Conservation Corps (CCC), and the cooperation of the Bureau of Public Roads, the National Park Service, and the Commonwealth of Virginia all wondrously converged to make this long-dreamed-of project a reality.

The construction was all done by private sector contractors, but the availability of the CCC provided a wealth of manpower to refine and finish the design. The CCC was responsible for items such as clearing vistas, cutting and thinning vegetation, and rounding and flattening slopes: the amenities that helped the drive to "lay lightly on the land." In addition, under the direction of local masons, CCC forces built dry stone guard walls and other invaluable additions to the beauty of the design, including 67 overlooks that accommodate parking.

As impressive as the construction and engineering aspects of the project were, perhaps the most lasting effects were the influences of the design concepts on subsequent eastern parkways under federal jurisdiction. The Skyline Drive is a direct descendant of the National Park roads of the western United States, but significant differences had to be faced and accommodated. The Mount Vernon Memorial and Colonial parkways begun in 1930 furnished some precedents. Charles E. Peterson, a landscape architect and subsequently a prime founder of the Historic American Building Survey, along with V. Roswell Ludgate, was involved on both the Colonial Parkway and the Skyline Drive.

Anyone who grew up in the area during the 1930s remembers the adventures of the Sunday afternoon excursion to "the Drive," as well as the frustrations of returning west from Washington, D.C., on U.S. 29 against an unending stream of cars returning from such excursions. The flora, fauna, and vistas of the drive, along with the relief from the summer heat before air conditioning and television, are indelibly etched in the minds of millions of Virginians and visitors.

A recent thesis titled "The Skyline Drive: A Western Park Road in the East" by Sarah Georgia Harrison concludes that the Skyline Drive serves as an outstanding example of a fine working relationship between landscape architects and engineers, and offers valuable lessons on road design in a natural environment. The successful accommodation of the various elements exerted an influence that altered the course of eastern parkway development. As Harrison concludes, perhaps "its most direct influence was on its expansion, the Blue Ridge Parkway, which in turn influenced the development of at least seven other national parkways and marked the beginnings of a national parkway system."

(To be continued)

Roads that Lay Lightly on the Land: The Blue Ridge Parkway: Part I

Howard H. Newlon, Jr.

["Backsights" No. 104a: originally published in the *Bulletin*, April 1985]

The Blue Ridge Parkway stretches 469 miles from its junction with the Skyline Drive in the Shenandoah National Park just north of the Afton Mountain crossing of Routes 250 and 64 to its intersection with Route 441 about 12 miles north of Bryson City, N.C. The parkway is the longest scenic roadway east of the Mississippi River, and it has also served in many significant ways as the model for subsequent eastern parkways and park roads developed by the National Park Service. Providing challenges and opportunities on a larger scale than ever before, its construction allowed the further refinement of the design concepts and construction processes that had begun with the Mount Vernon Memorial Parkway and continued through the construction of the Colonial Parkway and the Skyline Drive. The Blue Ridge Parkway has been extensively documented in *The Blue Ridge Parkway*, by Harley E. Jolley, originally published by the University of Tennessee Press in 1969 and reprinted for the fifth time in 1981, thus confirming the interest in the route among professionals as well as that of the many tourists who have enjoyed the magnificent vistas and leisurely paced life along the way for almost 50 years.

The first shovelful of earth was turned in September 1935. This event culminated years of dreaming, planning, discussions, and much controversy and was greatly facilitated by the confluence of a number of Depression-related factors previously discussed herein.

As early as 1909 there were plans and a survey for a visionary project that would create a pleasure road along the summit of the Blue Ridge, a road to be called "The Crest of the Blue Ridge Highway." Credit for conceiving this work is given to Colonel Joseph Hyde Pratt, head of the North Carolina Geological and Economic Survey. The scheme called for a highway and chain of hotels between Marion, Va., and Tallulah Falls, Ga., at an estimated cost of $5,000 a mile. In 1912, Pratt reported the highway would be a toll road rather than a public one. The portion between Altapass and Pineola, N.C., was actually completed, but World War I brought a halt to the effort until it was revived almost three decades later. Between World War I and 1930, little was heard of a Blue Ridge highway, but the Eastern National Park-to-Park Highway System, proposed in 1931 and described in Part I of this article, contained the connection between the Shenandoah and Great Smoky Mountains National Parks.

To identify the person or persons responsible for the conception of the Blue Ridge Parkway is not an easy task. In fact, in response to a congressional request made for just such an identification in 1953, Acting Director Hillory replied: "Careful examination of the records of this service fail to reveal conclusively what individual or individuals organized the idea for the building of the Blue Ridge Parkway."

According to Jolley, the number of claimants to that honor is remarkably small. He lists Harry Flood Byrd, U.S. Senator from Virginia; Thomas H. McDonald, Chief, Bureau of Public Roads; John G. Pollard, Governor of Virginia; George L. Radcliffe, U.S. Senator from Maryland

and Regional Advisor of the Public Works Administration; and Theodore E. Straus, one of Senator Radcliffe's advisors and a member of the Public Works Administration. Both Byrd and Straus publicly stated that they had suggested the original plan. The other three apparently never claimed credit, although their important contributions have been acknowledged by many of the participants. In addition to these five, it is clear that the project would not have progressed very far without the support of President Franklin Roosevelt and his Secretary of the Interior, Harold Ickes.

It is always difficult to identify the origination of an idea or concept, particularly one that had been discussed in various forms over several decades. Quotations from Senator Byrd and Mr. Straus suggest that each could lay claim to different aspects of the project without which it may not have come to fruition.

In a 1962 interview, Senator Byrd stated:

> At the dedication of the Shenandoah National Park, President Roosevelt, Harold L. Ickes, and I were riding together from Panorama to Big Meadows. I suggested to Mr. Roosevelt that it would be a fine idea to connect the two parks . . . by extending the Skyline Drive. He quickly agreed that it was an excellent idea but stated that we must begin up in New England. The President then said to me, 'You and Ickes get together for the right-of-way.' The New England governors were contacted but were not interested. In the meanwhile I was made chairman of the right-of-way commission. And that is how it got started.

This account has been questioned on the basis that the dedication of the Park did not occur until July 3, 1936, but Roosevelt, Ickes, and Byrd were together in the park in August 1933 for an inspection of a CCC camp, at which time the Skyline Drive had already been under construction for several years.

Straus, also in 1962, responded to an inquiry as to whether he was the true originator of the parkway as follows:

> You are correct. I am the originator of the mountain road connecting the Skyline Drive and the Smoky Mountains in North Carolina . . . in September, 1933, we had some business with the Governor of Virginia (Pollard) in Richmond . . . I had charge of the Roads in connection with the W.P.A. and suggested the now Blue Ridge Parkway.

It is probable that while Senator Byrd was encouraging the president to support the project in August 1933, Mr. Straus was likewise encouraging Governor Pollard. All of the claimants and many or their associates deserve credit for their vision, political know-how and dedication to the realization of this long-dreamed-of project.

The *Richmond Times-Dispatch* on Sept. 21, 1933, carried the headline, "$7,500,000 Plan for Scenic Road Headed by Byrd." But a number or issues were yet to be debated and resolved.

(To be continued)

Roads that Lay Lightly on the Land: The Blue Ridge Parkway: Part II

Howard H. Newlon, Jr.

["Backsights" No. 104b: originally published in the *Bulletin,* May 1985]

Construction of the Blue Ridge Parkway initially involved the resolution of questions concerning funding and the issues relating to rights of way. After some debate it was established that the road should be free of tolls, but the question of where the funds would come from had to be addressed. During the debate, then-Col. James A. Anderson, who was later to serve as Virginia's highway commissioner, stated that three plans had been considered but that two of these would require tolls. The other was to consider the work as a federal project, financed with federal funds, with the assistance of the highway departments of the several states the parkway would traverse. While Secretary Ickes wasn't excited about a project funded entirely with federal funds, after many discussions and negotiations, a compromise was reached whereby the project would be federally funded, with the states being responsible for securing the rights of way, hopefully by donations. Some landowners were quick to donate the land, but a few, particularly those with anti-administration sentiments, made the right of way procurement burdensome.

Ultimately, the thorniest issue became the location of the southern end connecting with the Great Smoky Mountains National Park, which lies in North Carolina and Tennessee. Within Virginia, officials were besieged with suggested routes for the southern end. At least all of these were within the Commonwealth. Since there were essentially two entrances to the Smokies, one via Knoxville and Gatlinburg, Tenn., and the other via Asheville, N.C., the vying for routes there was between two states and their cities that were natural competitors for the economic, employment and other benefits promised by the project. Each of the two states was fearful that the political influences of the other would cost them the route.

The initial location proposals were made by Virginia on Feb. 5, 1934, North Carolina on the sixth, and Tennessee on the seventh. While routes were suggested for the segment south of the Peaks of Otter in Virginia, the real problem was that North Carolina proposed a southern route into North Carolina to Asheville, which would place no portion at all in Tennessee. The Tennessee delegation proposed a route that would put approximately one-half of the mileage south of Virginia in North Carolina, but that would then swing north through Tennessee to Gatlinburg. Because of the conflicting proposals presented during the hearings, the commission decided to postpone a decision until an official reconnaissance could be made.

During the next seven months, several surveys were made, tentative locations were given approval at various levels, and the recommendations of North Carolina and Tennessee were promoted with all the vigor that the commercial and political interests could muster. Finally, on Sept. 18, 1934, Secretary Ickes convened a final hearing in the auditorium of the Department of Interior Building in Washington. Three hours were devoted to oral presentations, with each state being given an hour and a quarter to present, in debate format, its arguments, and then 15 minutes for rebuttal. Secretary Ickes sat at a table and served as moderator and timekeeper. On

the right was the North Carolina delegation, headed by its governor, which had left Asheville on a special train, with a brass band send-off, while on the left was the governor of Tennessee and his delegation. After the governors shook hands, a coin was flipped to determine which delegation would present its case first, and North Carolina won. Its delegation made a carefully timed and rehearsed presentation using visual aids that included a diorama of the route it favored.

Tennessee followed, and one of its spokesmen, Sen. McKellan, read from a highly secret report from an advisory group appointed by Secretary Ickes and headed by Sen. Radcliffe that had recommended the same route that had been proposed by Tennessee. McKellan demanded from Secretary Ickes public confirmation of the report. The North Carolina group, unaware of the report, were convinced their cause was lost.

After Ickes closed the hearing and took the matter under advisement, the lobbying intensified at all levels, including contacts with President Roosevelt. Finally, on Nov. 10, 1934, Secretary Ickes made his decision known in identical letters to the governor of North Carolina and Tennessee elaborating upon the reason for his choice. The parkway would follow the North Carolina route. His decision was hailed in North Carolina as an act of courage and statesmanship, while in Tennessee it was characterized as an outrage of conceit and arrogance. But the decision was final, and now the job of building was set to begin.

The magnitude and problems of the construction are stories within themselves that are covered in detail by Jolley. A quote from one mountain lady deriding the rumor of the parkway construction perhaps catches the feeling of the layman. She laughed and said: “One of them hard surface roads like they have below the mountains? Why Lord, have mercy, nobody a-livin’ could put one of them through here.”

But they did. Sensitively and lightly, the road followed the natural contours and passed through impressive tunnels. The first contract was begun in September 1935 on a 12.5-mile strip extending southward from the Virginia-North Carolina border. Because of delays in securing right of way and related scenic easements, grading on the first Virginia section was not started until Feb. 29, 1936. This was on the 8.127-mile section between Adney Gap and Pine Spur Gap, just south of Roanoke. It is generally conceded that the most difficult construction was encountered on the 9.4-mile section from Humpback Rock to Love, Virginia. The contractor used 35,000 drills and moved some 100,000 cubic feet of solid rock with what today would be considered primitive methods.

Along the route today the traveler can visit a number of beautiful lodgings and interpretative areas. Mabry Mill, south of Roanoke, is known worldwide. For those interested in the history of Virginia transportation, the restored canal lock and interpretative kiosk where the parkway crosses Route 501 in Bedford County is a must.

[*Image in original:* Photograph of Mabry Mill. *Caption:* Mabry Mill, a water-powered gristmill and a blacksmith’s shop built in the early 1900s, is a popular attraction on the 50-year-old Blue Ridge Parkway.]

[*Image in original:* Photograph of the restored canal lock. *Caption:* This restored canal lock lies on the James River near the intersection of the Blue Ridge Parkway and Route 501 in Bedford County.]

The Blue Ridge Parkway became the model for eastern recreational roads. Jolley closes his account of the parkway with a fitting tribute to the road and those whose vision and dedication it represents.

> Instead of ugly scars and rubble, they left a road for pleasure, one that emphasized the work of nature while de-emphasizing the work of man. It was an innovative enterprise, initiated because of a vision, pursued in spite of controversy, and pushed to completion with a liberal contribution of American ingenuity.

Roads that Lay Lightly on the Land: The Colonial Parkway: Part I

Howard H. Newlon, Jr.

[“Backsights” No. 105a: originally published in the *Bulletin,* June 1985]

In the initial article in this series, the erroneous impression may have been given that the Colonial Parkway was entirely a product of the 1950s when the 350th anniversary of the settlement at Jamestown was celebrated. While this was the occasion for completing the segment between Williamsburg and Jamestown, the road was conceived and the segment between Yorktown and Williamsburg completed between 1931 and 1938, which coincided almost precisely with the construction of the Skyline Drive.

Like the Skyline Drive, the Colonial Parkway, despite its name, is technically a park road, since it was conceived, designed and built as an integral part of what is today the Colonial National Park. It does, however, also conform to the definition of a parkway in that it connects three significant historic sites. On July 3, 1930, Congress established the Colonial National Monument, a historical national park embracing Jamestown Island, Colonial Williamsburg and the Yorktown Battlefield, and including a connecting parkway. The current name of the park was approved on June 5, 1936, along with some modifications of its boundaries.

Establishment of the park was enthusiastically supported by Secretary of the Interior Wilbur, Park Service Director Albright and Michigan Congressman Cramton, who introduced the legislation. The legislation complemented plans for a major recognition of the Yorktown surrender under the auspices of the Yorktown Sesquicentennial Association scheduled for October 1931.

Surveys of the area were begun in September and the boundaries were officially established on Dec. 30, 1930, by President Hoover. Work by a cadre of Park Service people then proceeded on three major programs: (1) acquisition of land, (2) planning and construction work on the sesquicentennial celebration site, and (3) surveying and design of the parkway between Williamsburg and Yorktown. Monthly reports by the Park Service noted that the Bureau of Public Roads, which was responsible for the design of the road, began its surveys in February, and throughout the spring had from 15 to 20 field and office people employed in surveys, preparation of plans, estimates and other activities necessary to let to contract from 10 to 12 miles of the roadway construction prior to July 1, 1931. For the Park Service, Oliver G. Taylor was the engineer-in-charge and Charles E. Peterson the landscape architect-in-charge. Superintendent William Robinson, Jr., arrived July 8, 1931.

The first two units were let to contract in June 1931. Unit I included grading of 7.9 miles and construction of a railroad overpass at the Naval Mine Depot and moderate-size structures at Brackens Pond, Cub Creek, and Jones Pond. The contract was awarded to the Nello L. Teer Company, which incidentally was to have the first contract on the Blue Ridge Parkway five years later. Unit II comprised construction of 4,500 feet of roadway to be made by hydraulic fill material obtained from the York River by the Arundel Corporation. Subsequent contracts were

awarded for bridges over Indian Field, Felgate and King creeks in September. In his December report, Superintendent Robinson indicated that Teer had been working about 130 men and that his contract was about 60 percent completed while the Arundel segment was 85 percent complete.

[*Image in original:* Colonial Parkway bridge. *Caption:* Brick-faced structures and an exposed aggregate concrete roadway contribute to the aesthetics of the Colonial Parkway.]

On May 3, 1934, the first paving contract was begun by the Roberts Paving Company of Salisbury, N.C. A unique feature of the pavement was its exposed aggregate finish achieved by washing the surface with acid and brushing it to obtain a pebbly effect. This was only one of the efforts made to ensure what today would be called "environmental compatibility." Another was the use of brick veneer on all of the bridges. The perceived excessive cost of this design apparently was questioned, and the Bureau of Public Roads encouraged Peterson to visit the George Washington Parkway to observe its concrete bridge as a possible alternative. After his visit, Peterson rejected similar designs as inappropriate for the Yorktown area and persisted with the brick-faced approach. After the contracts were awarded, he noted with obvious satisfaction that the contractor's bid for the veneering was about one-third of the engineer's estimate. As was the case with the parkways along the Blue Ridge, the Civilian Conservation Corps, active in the area from 1933 through the early years of World War II, carried out most of the landscaping.

It is of interest to note that Gilmore Clarke, landscape architect, who made outstanding contributions to park and parkway development as a consultant to the Westchester New York Parkway Commission during its pioneering projects beginning with the Bronx River Parkway, completed in 1923, spent April 7 and 8, 1931, with Peterson studying the location "with particular interest centered on the routing around Williamsburg." Undoubtedly, the use of concepts that had been so successful in New York was discussed.

The centrality of the environmental focus is evident in the Teer contract, which states that "special attention must be given to the landscape features of the work and special care taken to protect natural surroundings. . ."

During the initial planning and design, major attention and discussion had to be directed to the segment through the Naval Mine Depot near Yorktown, since the road passed between the land and river portions of the facility, separating not only the official activities but also the personnel's living quarters from the recreational features of the York River. As the final segment between Yorktown and Williamsburg was completed in 1938, the issue of the Williamsburg connection was being addressed, even as the winds of war were building in Europe, presaging an event that would delay for over a decade completion of the project on which significant progress had been made.

(To be concluded)

Note: Appreciation is expressed to Park Historian James Haskett, who enthusiastically and helpfully made his files available to provide information for this article.

Roads that Lay Lightly on the Land: The Colonial Parkway: Part II

Howard H. Newlon, Jr.

[“Backsights” No. 105b: originally published in the *Bulletin,* July 1985]

From the outset it was anticipated that the Colonial Parkway would follow a route north and west of Williamsburg to Jamestown. As the final segment between Yorktown and Williamsburg was being completed in 1938, specific attention was directed toward the Williamsburg connection. Several routes between Williamsburg and Jamestown had been suggested, including “northern” and “southern” segments that would permit entry to Jamestown by one and the return to Williamsburg via the other. The *Newport News Daily Press* reported that “A rumor has been current for some time that the parkway might follow a tunnel under Williamsburg. Credence was given to this report recently when soil borings were taken along the suggested route.” Exactly who convinced the idea of tunneling under rather than bypassing Williamsburg is not clear. Initially, Williamsburg Mayor Hall opposed the tunnel, which apparently had the support of Colonial Williamsburg. In any event, on April 15, 1940, construction was begun on the tunnel under the restored area. It was unfinished at the time of Pearl Harbor and was not opened to traffic until May 10, 1949.

The southern exit of the tunnel thus became the beginning point for completion of the road to Jamestown. On March 22, 1941, work began on Halfway Creek Bridge, four miles south of Williamsburg on the direct southward location that was significantly to the east of the routes planned earlier. The war caused this to be a “bridge to nowhere” for over a decade.

World War II also brought other disruptions. On Nov. 15, 1942, at the request of the Navy Department, the Colonial Parkway, from its intersection with Route 238 near Yorktown to Jones Pond about four miles east of Williamsburg, was closed to public traffic “for the duration.” This restriction was lifted on Aug. 20, 1945, and the road once again became available for public use.

Construction was resumed in 1954 in anticipation of celebrating the 350th anniversary of the founding of Jamestown. The celebration, along with establishment of the Park Service Mission 66 Project, provided funds for completion of the Williamsburg-Jamestown portion in a race against time. Nello L. Teer, who had completed the first grading contract in 1931, was the paving contractor on this portion, and working after dark, under flood lights, he delivered the project for the April 1, 1957, opening of the Jamestown Festival.

[*Image in original:* Williamsburg Tunnel project. *Caption:* The Colonial Parkway tunnels under Colonial Williamsburg during one phase of its construction. *Photo courtesy Colonial Williamsburg, Inc.*]

The preceding articles in the series under this major title, “Roads that Lay Lightly on the Land,” have traced the planning, development, and construction of the parkways and park roads that lie within the boundaries of the Commonwealth. The George Washington, Blue Ridge, and

Colonial Parkways, along with the Skyline Drive, are vital elements in Virginia's attractiveness to tourists interested in history and recreation. These four roads individually and together represent the initial efforts by the federal government to develop scenic roads in the eastern United States equivalent to those built as part of the national parks in the western part of the country. Thus, these roads were the testing grounds for trying and refining new concepts that would accommodate the need for easy access and travel with minimal intrusion on the natural and historic resources that were attracting travelers.

The four projects were conceived and executed within a relatively brief time span, and transfer of concepts and techniques among the projects took place both intentionally and by coincidence. Clearly, the major impact came through the National Park Service and the U.S. Bureau of Public Roads under the guidance of Horace Albright and Thomas H. McDonald. Presidents Hoover and Roosevelt recognized the benefits of these public works, not only as a means for providing employment during the Great Depression and recovery years, but also as a means for offering to the common man expanded recreational opportunities made possible by the success of the motor car that initially had been available only to the very rich. Interior Secretary Harold Ickes provided the overall administrative and political skills needed to implement the plans.

Virginians Pollard and Byrd were vital participants, along with Highway Commissioner Shirley, but the impact of Will Carson, head of Virginia's Conservation and Development Commission, cannot be overemphasized. Adopting the philosophy that conservation and tourism were the linchpins for expanded economic development, Carson established the system of state parks that developed along with those under federal jurisdiction.

In large measure, successful completion of the roads was possible because of the depressed economic conditions that led to the creation of the Civilian Conservation Corps and thus made available large numbers of workers for providing landscaping and other amenities for the roads. The emphasis on landscaping brought the young Charles E. Peterson, who later would found the Historic American Building Survey, to Yorktown from his post with the Park Service in San Francisco. He was responsible for the environmentally sensitive design of the Colonial Parkway and transferred these ideas to the initial layout of the Skyline Drive. During the early days at Yorktown, Peterson took advantage of the experience of Gilmore Clarke, landscape architect for the highly successful parkway system in Westchester County, N.Y.

The Nello L. Teer Company had the first construction contract on the Colonial Parkway, which undoubtedly provided valuable experience that later would be put to use in the first contract on the Blue Ridge Parkway.

Today, millions enjoy and recall with pleasure travel along these roads that provide sylvan, breathtaking views of the natural beauty of the Commonwealth. The experience is obviously enhanced by the vision, skills and dedication of those who worked to ensure that the roads would "lay lightly on the land."

Henry Garnett Shirley: A Versatile Highway Giant

Nathaniel Mason Pawlett

["Backsights" No. 106: originally published in the *Bulletin,* August 1985]

One of our historians once speculated upon the fact that while the great Virginians of the Revolutionary period generally were statesmen, the great Virginians of the 1860s tended to be soldiers. He concluded that this was probably due more to the opportunities presented them to display their genius than to anything else.

Among twentieth century Virginians, Henry Garnett Shirley probably possessed the character and abilities—both by his inheritance and by his own natural development of them—to have played a role as *either* statesman or soldier had he lived during one of these earlier periods.

Henry Shirley was the great great grandson of the immigrant Walter Shirley, a younger son of the first Earl Ferrers of England, who was born in 1690, came to Virginia in 1726 and settled in what was to become Jefferson County, Virginia (now West Virginia) on a thousand-acre tract that he received from Lord Fairfax.

Prominent Virginia roots

Descended from a long line of locally prominent individuals who served as militia officers and gentlemen justices while engaging in agricultural pursuits, Henry was also connected through his mother with the Garnett and Baylor families, long prominent among the Virginia gentry.

Henry Garnett Shirley was born at Locust Grove, Summitt Point, Jefferson County, then but recently become West Virginia, on October 28, 1874. He was the son of Robert Vinson Shirley and Julia Baylor Shirley, apparently having been named for his mother's brothers, Henry and Garnett Baylor.

His early education seems to have been handled by a private governess, followed by the public schools and the Charlestown Male Academy. In the fall of 1892 he entered Virginia Military Institute, a choice perhaps dictated by the fact that both Henry and Garnett Baylor had attended that institution. There he was rather prominent in student life, earned a spot on the football team and became a first lieutenant of Company A in the cadet corps. He finished in 1896 in civil engineering.

He then accepted a position as Commandant and Professor of Military Science at Horner Military School in Oxford, North Carolina. Following the outbreak of hostilities with Spain in 1898, however, he enlisted in the U.S. Volunteers.

Early engineering work

After the war, he began his first professional engineering work with the New York Central and Hudson River Railroad at Buffalo. He later worked for the West Virginia Central and the Baltimore & Ohio and for the engineering department of the District of Columbia. Five years of experience were then required in civil engineering by the Virginia Military Institute; at this point, Shirley was awarded the degree of civil engineer.

While in the employ of the B&O, Shirley worked with the engineers in retracing the location of the uncompleted South Pennsylvania Railroad, then being examined by the B&O for a low grade line through the Allegheny Mountains. Readers may recall that Claibourne Rice Mason was responsible for beginning some of the tunnels on this line, tunnels that were completed many years later by his company when the Pennsylvania Turnpike was being constructed along this line.

But Shirley's principal engineering work came in the development of modern highway systems. His first such work was as roads engineer in Baltimore County, Maryland, beginning in April 1904, followed by appointment to the office of chief engineer of the Maryland State Roads Commission. In this position, Shirley was one of the organizers of the American Association of State Highway Officials in 1914 and its first president. Apparently extremely well-liked, he served as president for two years and was presented with a large silver cup at the end of this time.

Continuing as a member of the executive committee of the association, he was a member of the special committee on highway transport cooperating with the National Automobile Chamber of Commerce. In 1918, he became executive secretary of the Federal Highway Council, the body which then advised the federal and state governments and the various colleges and universities on what highway research was being conducted and what new research should he undertaken.

Critical wartime help

At the beginning of World War I, Shirley became a member of the Highway Transport Committee of the Council of National Defense, giving considerable effort to ensure that U.S. roads would be in condition for the transportation of military supplies to the various camps and ports.

Shirley again became engineer of Baltimore County in 1920 to help with a huge program of street and road building then being undertaken by the suburbs of Baltimore. In 1922, in accordance with legislative enactment requiring that the chairman of the State Highway Commission be an engineer, he came to Virginia. From then until his death in 1941, he was the head of the Department of Highways—first as chairman of the Highway Commission and then as commissioner.

Serving under five governors, he developed a national reputation while taking Virginia to the forefront in modern highway development. By 1937, according to his biographical sketch in

Virginia Democracy: A History of the Achievements, the Parts and Its Leaders in the Mother of Commonwealths, the Old Dominion (Robert C. Glass and Carter Glass, Jr., authors), of the "more than nine thousand miles comprising the primary system of Virginia highways, two thousand three hundred and thirty six miles are now in the rating of high type of construction, five thousand nine hundred and twenty miles are rated as secondary, gravel, soil and oiled roads, complying with the federal regulations requiring dustless and mudless materials, making the highways of the state ninety-one percent improved for year round use."

Reputation, honors grow

As his reputation grew, honors and appointments continued to come. In 1925, he was elected to the executive committee of the American Road Builders Association and the following year president. In that office, he appointed the delegates to the International Road Congress at Milan, Italy, and was himself subsequently a delegate to various International Road Congresses.

Awarded the honorary degree of doctor of science by the University of Maryland and by Hampden-Sydney College, he was also one of the organizers and, later, president of the Virginia Section of the American Society of Civil Engineers and always took a great interest in the engineering profession. Not surprisingly, he maintained close contact with his alma mater, the Virginia Military Institute.

Perhaps significantly, considering who were the authors of *Virginia Democracy*, Shirley was therein particularly commended for producing highways that "greatly promoted tourist travel, people visiting the many shrines and places of historic interest in the state, each year showing a large increase in the amount of travel with its resultant benefit to business of various kinds."

The same sketch also cited him for "the construction of the Skyline Drive. . . . which is attracting tourists in increasing numbers each year. . . ." Certainly this must have been well-nigh the official view of the then-dominant Democratic Party and exhibited the satisfaction with Shirley and his work existing in these circles.

Shirley was married on November 29, 1904, to Alice Robertson Graham of Oxford, North Carolina. She died October 22, 1916. This union produced five children, of whom two survive.

On September 17, 1930, Shirley again married, this time to Sara Anne Berkeley, now living in Richmond. Interestingly, Shirley had no son named after himself. His grandson, Henry G. Shirley II, received the honor, however, and graduated from Virginia Military Institute as had his father Augustus Graham Shirley.

This spring, the great grandson—another Augustus Graham Shirley—graduated from there, making four generations of Shirleys to do so.

A fitting epitaph

Perhaps Henry Garnett Shirley's best epitaph exists in the biographical sketch prepared by those who knew him and published in the *Transactions of the American Society of Civil Engineers*:

> He was a man of rare intellect and had a peculiar personal charm that gave him great ability, as an executive; this, coupled with the skill of a master of engineering, made him an international figure in the highway world. These same traits placed him, in the minds of his friends and close associates, in a position even higher than that of his national reputation, so that it would be difficult to find a department more completely coordinated and cooperative than the Virginia State Department of Highways. Mr. Shirley possessed a disarming frankness in his approach and discussions with men that brought out the best in all those with whom he came in contact; he was frank and open in his dealings and handled many difficult situations in his administration of the Virginia State Department of Highways so successfully that he was looked upon as one of the outstanding officers of the state government.

"Henry Garnett Shirley was a man of rare intellect and had a peculiar personal charm that gave him great ability as an executive; this, coupled with the skill of a master of engineering, made him an international figure in the highway world." (Reprinted from *Transactions of the American Society of Civil Engineers.*)

The Virginian: A Railroad From the Romantic Era

Nathaniel Mason Pawlett

["Backsights" No. 107: originally published in the *Bulletin*, September 1985]

The romance associated with the days of railroading is difficult for most people to conceive in these days of the diesel locomotive and its droll, foghorn-like blare.

Equally foreign to us in this day of the interstate highway and easy automobile access is the excitement that could once be generated throughout an entire area by the building of a major new railroad.

Just such a road was the Virginian Railway, which traversed the Valley and Southside Virginia in the opening decade of this century to terminate at Norfolk. Perhaps the most interesting aspect of the Virginian's construction is the stealth and cleverness with which it was apparently accomplished.

[*Image in original:* Virginian Railway Logo. *No caption.*]

Primarily a coal transportation railroad, the Virginian seems to have owed its existence to the fertile minds of two men, William Nelson Page and Henry Huttleston Rogers.

While the career of Rogers as a financier and Rockefeller partner is rather well documented, that of Page is not so well known—but it certainly should be! One of thousands of Virginians who achieved fame and fortune elsewhere while engaged in developing the resources of the country, Page would also have to be featured prominently if any history of the "Ancient Dominion's" engineering profession is ever written.

Born in Campbell County in 1854, the son of Edwin Randolph Page and Olivia Alexander, he was educated at the Leesburg Academy and later took a special course in engineering at the University of Virginia, ultimately becoming both a civil and mining engineer

His first employment apparently was as a rodman on the location and construction of the Chesapeake and Ohio Railway in the New River gorge in 1871 and 1872. He located and built the Mill Creek Canyon branch railway in 1874.

Later, he was in charge of a party locating the route for a double track railway ordered by Congress from the Ohio River to Hampton Roads (1875-76), was general manager of the Hawk's Nest Coal Company (1877-80), built and operated the Victoria Blast Furnace at Goshen (1880-85), located and built the Powellton branch of the C&O (1885-89) and also developed the Mount Carbon Collieries.

From 1889 to 1917 he simultaneously organized and developed the Gauley Mountain Coal Company, built the railroads that were to become the Virginian and served as consulting

coal engineer for the Amalgamated Copper Company and many others. He was also an officer in the West Virginia National Guard, ultimately advancing to brigadier general; the mayor of Ansted, West Virginia, for 10 years; an incorporator and director of Sheltering Arms Hospital; an Episcopalian churchman and a Mason, before dying in 1932. Altogether, his was quite a remarkable career for any man.

Just when the plan for the Virginian first came into being may never be known for certain, because Rogers was a man who kept his own counsel and Page always claimed that the railroad was the product of an evolutionary process rather than a concerted effort.

Whatever, the idea and the theoretical route for the railroad from the New River, near Deepwater, West Virginia, to Norfolk must have existed in Page's mind as a sort of pet project for many years prior to 1900. Rogers, too, must have heard many times from Page the arguments for the railroad to carry timber and coal from the mountains whether any agreement to build it was then reached between them or not.

On January 25, 1898, a West Virginia charter was issued to the Deepwater Railway to build 60 miles of line from the village of Deepwater, up Loop Creek and to Matoaka in order to develop a 26,000-acre tract of coal and timber land owned by a group of New York investors. The line, as projected at this point, would ultimately connect the C&O on New River with the N&W north of Bluefield, and all outgoing shipments would go over one or the other of these two lines.

Perhaps, but the mileage of the line remained about four miles, sufficient to serve only a lumber mill near Deepwater through the years 1898-1902. One is tempted to wonder if Page and Rogers were really letting the charter "cool off" awhile to lull the C&O and the N&W to sleep on the assumption that this was to be only another grandiose and yet stillborn railroad project.

Finally, in 1903, some grading began from the town of Robson to the Guyandot River, a distance of 55 miles. Not too surprisingly, the charter for the Deepwater, a West Virginia corporation, had been amended in 1902 to allow it to run on to the Virginia state line.

Page was in charge of all operations, apparently on the basis of only a gentlemen's agreement with Rogers, who arranged for a bank in Boston to give Page a letter of credit for $18,000,000 to be followed by $2,500,000 a year thereafter for the purpose of constructing the railroad. This bank and a firm of lawyers provided Page with the instructions, legal help and financial support that he needed while allowing Rogers to remain in the background, apparently divorced from the affair.

Very little was committed to paper by Rogers (on principle), so little documentation exists as to what their arrangements were. Page later testified that he "supposed" Rogers provided the money, but he could not really swear to it at all. A secret survey also was conducted in 1903 showing that the best route with the best grades would be achieved by following the New River on the opposite side from the N&W to near Blacksburg hence across the divide near Christiansburg to pick up the headwater of the Roanoke River, following the river

through the Blue Ridge and down to what is now Altavista and Brookneal, and then across Southside Virginia to Norfolk.

Again not surprisingly the Tidewater Railway Company was shortly chartered in Virginia on February 13, 1904, to build a railroad from the West Virginia line to Norfolk. Page just happened to be the president of this line, as he already was of the Deepwater, while the directors of both roads came from Page's coal office. The vice-president of the Tidewater turned out to be Rogers' coal business lawyer, Thomas D. Ransom.

Even the surveying techniques used by Page and Rogers were stealthy. One Sunday in February 1904 a group of 125 anglers got off the N&W train in the New River gorge between Belspring and Glen Lyn with their fishing equipment. These "fishermen" turned out to be surveyors, and their "fishing equipment" turned out to be surveying equipment. The line was staked out the next day. (The icy New River is a really strange place to fish in February, anyway!)

At another strategically located gap, the C&O surveyors were at work but found, annoyingly, that many of their landmarks seemed to move. The Rogers and Page engineers proved to be in the area, so the C&O people went home. The Rogers group rapidly completed its survey, filed the maps, laid rails and put a tunnel in the location the C&O had intended to use for theirs, thus preempting the route.

With the Tidewater chartered in Virginia, the Deepwater still extended only 10 miles, but construction was in progress on 81 miles to Rock, West Virginia.

The next year, 1905, was to be the big one, however. With the route secured, Rogers and Page pulled out the stops, and construction never let up until the road was completed. The Tidewater advertised for bids for 95 miles west from Sewell's Point at Norfolk in March, and it was contracted by May 15, 1905.

By February 1906 the whole line was under contract. One of the early sections to be completed was that between Brookneal and Roanoke. At the end of 1906, the Deepwater had 58.55 miles and the Tidewater 56.59 miles.

The approaching completion and joining of the two railroads made imperative an altered corporate structure, so on May 8, 1907, the Tidewater changed its name to the Virginian Railway and purchased the Deepwater on April 22. Their purposes now substantially achieved, Rogers and Page found deception no longer necessary. Construction on the railroad continued across Virginia and West Virginia, and, as the line began to be completed, on its stations, sidings, and yards.

By 1909 the Virginian had about 440 miles of track, a figure that would rise to almost 600 miles before it was finally merged with the N&W on December 1, 1959.

Though primarily designed as a timber and coal transportation railroad (it would become famous for this and for its gigantic steam engines), the Virginian also gave a tremendous impetus

to economic development along its line across Virginia. Besides the cash flow generated by the railroad itself through its operations and payroll, the presence of the line gave rise to town development schemes at various points.

Altavista, Victoria and Kenbridge, to name just a few, owe their existence primarily to the Virginian and the dreams of these promoters. And such cities as Roanoke, which already owed its rapid growth to railroads, and Norfolk also had their rates of growth further accelerated by the construction of the Virginian. Enterprises dependent upon a good outlet for their products now became feasible over the large area served by the new railway.

Many of the fruits of this economic development remain today along the line of the Virginian, most of which is still in service under the name of the N&W. The excitement that the construction of this railroad once created across Southside Virginia is forgotten now, except for the memories of a few of the very oldest people living along the line.

Gone are the gigantic, puffing steam engines called mallets; gone are the steam whistles that romantically wailed in the night and stirred the imagination of many a small boy who dreamed of growing up one day to become a real live locomotive engineer; gone too is the round, strangely colored orange emblem of the Virginian Railway. Only the memory remains, now fast fading to oblivion.

Discovering the Electric Rail System

Nathaniel Mason Pawlett

["Backsights" No. 108: originally published in the *Bulletin*, October 1985]

The author first became interested in the history of the old Virginian Railway while assisting in the survey of early masonry and concrete structures in southwest Virginia. That is when he first saw the powerhouse and the gigantic concrete pillars still standing in the New River at Narrows.

[*Image in original:* Railway, at Narrows. *Caption:* The gigantic concrete pillars from the old Virginia Railway line are still standing in the New River at Narrows.]

What had been the purpose of these? Finding the answer proved a very interesting experience, as he learned the early history of the railroad and got to meet a host of "originals," including Henry Huttleston Rogers, William Nelson Page and many others of both high and low degree.

Earlier similarities

Discovering the electric rail system, which centered on the Narrows power plant, reminded him of similarities between it and the inclined planes used by Virginian engineer Moncure Robinson in conjunction with railroads in the early 19th century and described in an article on him. (See the "Backsights" column in the October 1980 edition of the *Bulletin*.)

Readers may recall Robinson's use of inclined planes to overcome steep grades, usually in the transportation of coal, in getting from the railroad's grade down to water level. Typically, loaded cars being lowered to water level to be emptied onto water carriers provided the motive power to lift empty cars back to grade level for return to the mine by rail. On one, water was used to fill specially designed tank cars that were used as counterbalances to the loaded coal cars.

Ingenious accomplishment

The Virginian Railway's system managed to accomplish a similar task over a much greater distance by the use of ingenious electromechanical means.

Just east of Elmore, W. Va., and 350 miles west of Norfolk, was Clark's Gap. For the Virginian to get the coal trains assembled at Elmore moving east through this gap, 14½ miles of roadbed with a grade of about 10 feet to the mile had to be traversed.

Normally this was accomplished by putting on as many engines as necessary to reach the crest and start down toward the New River. This Clark's Gap "problem" ultimately led the Virginian to develop bigger and still more powerful engines.

Finally in the 1920s, the Virginian, in conjunction with Westinghouse, devised an electrical system to solve this problem as well as that of the trains of westbound empties trying to negotiate the reverse grade into West Virginia. The line was electrified from Mullens, W. Va., near Elmore, to Roanoke.

Regenerative locomotives

A powerhouse was built at Narrows to supply the needed high-voltage alternating current from coal to the line's new electric locomotives. These electric locomotives became regenerative in descending the mountain whichever way they were going, as the motors became generators and returned power to the line.

[*Image in original:* Power plant, at Narrows. *Caption:* The Narrows power plant was central to the Virginia railway's ingenious electric rail system.]

Trains descending might supply power to those on the way up anywhere within the system between Mullens and Roanoke, with the coal-fired power plant making up any deficit. When descending locomotives were generating all the power needed by ascending ones, none was necessary from the power station.

If more power was being produced by descending locomotives than was necessary to operate the ascending ones, this power was returned to substations and ultimately back to Narrows, where a water rheostat or grid of electrodes in the river dissipated it, often boiling the water in the New River.

This construction obviously occurred before the days of environmental impact statements! Stripped of excess technical detail, this was the delightfully ingenious system installed about 1925 over the distance between Mullens and Roanoke with the Narrows power plant as its heart. The similarity to what Moncure Robinson had done 100 years before is obvious; only the means were different.

Not only was the system ingenious, but so was the pulling power of the new electric locomotives. Initially, there were many scoffers among the devotees of steam on the Virginian. They were soon converted.

Test proves conclusive

A test was arranged in which a large mallet-type steam locomotive was attached to a train weighing 6,000 tons, with two more steam locomotives placed behind it as pushers. It received a 15-minute head start. Then an electric locomotive, with identical tonnage and one pusher behind it, was dispatched. It easily overtook the steamer after just 15 miles.

On the steepest part of the grade, the electric could operate at 14 mph while the best steam could do was 7 mph. The superiority of the electrics was further demonstrated when they were stopped on the grade and then restarted. In only three minutes the electric locomotive could attain its original speed.

The triumph was complete. Neither so romantic nor so apparently powerful as the Virginian's steam locomotives, the electric locomotives were vastly more powerful, if also much uglier. They would hold sway in their domain, the Virginian's version of the "inclined plane," until finally replaced by the diesel-electric locomotives which generated their own power internally.

Age of Rapid Change Driven by Technology

Howard H. Newlon, Jr.

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In a recent speech to the ASCE Specialty Conference on "Highway Infrastructure: Opportunities for Innovation," Thomas D. Larson, secretary of transportation for the Commonwealth of Pennsylvania, emphasized the centrality of change in our society.

Larson observed that 20 years ago interstate construction was in full swing, except in cities where the freeway revolt was beginning; transit was provided almost entirely by private companies, and the public transit agencies were monopolies; the Washington Metro System was not begun; Conrail and Amtrak didn't exist; the Urban Mass Transit Administration hadn't been created; environment impact assessments were few; an energy crisis was unthinkable—gasoline sold for $.35 a gallon, less than today's price for a cup of coffee; and the private sector was only beginning to use a device we now see everywhere—the computer.

Technology causing change

We clearly live in an age of rapid change that in many cases is driven by technology. Currently, computers and the related technology are rapidly changing the way we live and hold promise of even more dramatic impacts.

Even as these previously cited changes and many others have occurred during the past two decades, a number of significant centennials have been celebrated. These include the transcontinental railroad (centennial date: 1969), the telephone (1976), Edison's light bulb (1979), the Brooklyn Bridge (1983), and the standardization of time (1983). Within the next decade, others, including many associated with the automobile, will be observed.

These centennials remind us of how dramatically the technology that spectacularly changed the way we live was being exploited over a century ago.

Even to those who've experienced it, the magnitude of changes during the last two decades may be surprising. In many cases, these innovations have been the object of continuing complaints from detractors who "long for the good old days."

Response to change generally is ambivalent. In the last quarter of the nineteenth century, however, each innovation was hailed not only as evidence of American ingenuity and know-how, but also as an opportunity for economic gain. Progress lowered fulfillment of our "Manifest Destiny."

Gast's painting reflects response

This response is graphically reflected in John Gast's painting, "American Progress" (copy shown here). When prints of this painting were published in 1873, the explanatory text on the reverse side stated that it showed "the grand drama of Progress in the civilization, settlement, and history of our own happy land."

A print of John Gast's famous painting, "American Progress," depicts "the grand drama of Progress in the civilization, settlement, and history of our own happy land."

The original of this painting, which hangs in the office of the president of the Congoleum Corporation, was one of many on exhibit during the celebration of the centennial of the building of the Brooklyn Bridge, which can be seen in the painting's upper right corner.

From the ship-filled harbors, factories, and commercial centers of the East (specifically New York and Brooklyn) toward the West are moving the evolving forms of transportation—from primitive ox-drawn wagons to the three railroad lines representing the transcontinentals. This painting dramatizes the critical role of transportation in the nation's growth and economic development.

Above the scene looms "a beautiful and charming female floating westward through the air, bearing on her forehead the Star of Empire." In her right arm she carries a book representing "common schools," and with her left "she unfolds and stretches the slender wires of the telegraph" that are to "flash intelligence throughout the land."

Into the darkness of the West retreat buffalo, bear, coyote and a family of Indians before the "light of progress." Only three years later, the woman could have carried telephone lines and, within the decade, lines to distribute electrical power. The "light of progress" would have then been *electric*.

Brooklyn Bridge symbolic

Though it occupies only a small portion of the painting, the Brooklyn Bridge not only was a symbol of technology as the longest suspension span in the world, it also was viewed as a prime conduit by which the knowledge theretofore isolated in Brooklyn by the East River would begin its journey westward. At the time the Brooklyn Bridge was constructed and opened, Brooklyn was the equivalent of today's Silicon Valley in terms of technology and innovation.

Elmer Sperry chose Brooklyn as the location for his gyroscope factory because of that reason. On Brooklyn Heights were many noted writers, such as Stephen Crane, and the church of one of the country's most influential preachers, Henry Ward Beecher. The Brooklyn Bridge was seen as a key to disseminating technology and knowledge throughout the land. While the painting's depiction of a diverse land from "primitive" to "high tech" may seem overdrawn, it was in fact the case.

While the tower of the world's longest suspension span was being completed in 1876, word came that General George Armstrong Custer and his command had been massacred at the Little Big Horn. One can almost hear the Easterners say, "If we can build the world's longest bridge, why can't we defeat the Indians?" Still today, we ask, "If we can go to the moon, why can't we . . . ?"

Secretary Larson closed his talk by stating, "Those of us in the business of providing transportation must develop a passion for innovation, a passion to constantly seek new ideas and better products. It must be our passion to provide highway transportation for survival on economic spaceship earth."

It's difficult to predict the future, but several things are certain—change is constant and transportation is a key element in progress, not only on our land as depicted in the Gast painting, but throughout the world.

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