STONE ARCH BRIDGES IN MARYLAND

Although no datable seventeenth or eighteenth century stone arch bridges in Maryland are known, the 1699 Act of the General Assembly requiring "good and substantiall" bridges over all heads of creeks and rivers may have occasioned construction of stone bridges as well as timber bridges, since the basic technology of stone arches was well known by that time (Browne 1902:475-476). The earliest legislative reference to arch bridges was the 1794 law which specified that common laborers hired by the county courts should not be permitted to supervise construction of "framed or arched" bridges over 15 feet in length (Kilty 1808:November 1794 Session, Chapter 52). This law, however, clearly indicated that the stone arch bridge was a familiar and important bridge type in early national, and probably colonial, Maryland.

The advent of turnpikes in the state, pursuant to an 1804-1805 law incorporating Maryland's first private toll road companies, spurred construction of stone arch bridges for important crossings where simple timber beam structures might be likely to wash out or deteriorate under heavy wagon traffic. A questionnaire sent out to major Maryland turnpike officers in 1818 under authority of the General Assembly and Governor Charles Goldsborough elicited evidence that the Baltimore and Reisterstown Turnpike Company had built many bridges "of solid materials," while the Baltimore and Frederick Turnpike Company had by that time expended over $56,000 on constructing the four-span stone bridge over the Monocacy just southeast of Frederick (this 1808 bridge, known as the "Jug Bridge," stood until 1942). The Baltimore and York Turnpike Company had built five one-span and two-span stone arch bridges on its improved "York Road," including the oldest extant datable stone arch bridge in Maryland, the Parkton Stone Arch (Goldsborough 1818). The Lloyd family of Chambersburg, Pennsylvania, and their various associated masons, dominated construction of the early nineteenth century stone arch highway bridges of Washington County; James Lloyd also is recorded as builder of the B&O's pioneering Carrollton Viaduct of 1829 (Mish and Cottingham 1977; Schodek 1987:77-78).

PLATE 4: **Typical Multiple-Span Stone Arch Bridge: Wilson's Bridge Crossing Conococheague Creek on the National Pike**

SOURCE: MDOT Photographic Archives (Hughes Co. Photographers, circa 1930)

Between 1811 and 1825, the federally built National Road also was constructed through Maryland between Cumberland and Uniontown, Pennsylvania. This landmark early federal public works project involved design and construction of numerous small-span arch culverts and a number of significant large bridges, such as the 1813 Casselman River Arch. Simultaneously, the Maryland legislature sponsored numerous extensions to the Baltimore and Frederick Turnpike with the object of connecting eastern and central Maryland to the National Road at Cumberland. The 1818 Wilson's Bridge and other early structures among the approximately 30 significant stone arch bridges known to have been built in Washington County were erected on these turnpikes linking Baltimore and Frederick with Cumberland and points west (Mish and Cottingham 1977).

Major canal projects, such as the Chesapeake and Ohio Canal (1828-1924) and the Chesapeake and Delaware Canal (begun 1824), also inspired construction of stone arch culverts and several large aqueducts to carry the canals over intervening streams and rivers. Perhaps the greatest impetus to stone arch bridge construction in Maryland, however, occurred with the founding and expansion of the Baltimore and Ohio Railroad during the 1820s and 1830s. During that period under the guidance of such distinguished engineers as Benjamin H. Latrobe, Jr., and Jonathan Knight, the B&O first erected near Baltimore its nationally significant Carrollton Viaduct (earliest stone arch railroad bridge in the nation), followed this with construction of other early stone arch railway spans at Ilchester and Ellicott City (Patterson and Oliver Viaducts, each now only partially extant), and climaxed its initial expansion toward Washington with the design and erection of the extant Thomas Viaduct in 1835, an imposing eight-span Roman arch structure that was the first multiple-span railroad viaduct and the first to be built on a horizontal curve (Harwood 1979).

The initial B&O building campaign also involved construction of numerous, less prominent stone arch culverts. A second major building campaign, between the late 1890s and 1910 under former Pennsylvania Railroad Chief Engineer Leonor Loree, resulted in the erection of a second generation of stone arch culverts and viaducts, many of which appear to be extant based on historical research and prior Maryland Historical Trust historic resource survey forms prepared by county historic preservation officers in the counties through which the B&O passed. During the nineteenth century and the early twentieth century, the growing city of Baltimore also engaged in construction of many stone arch spans for culverts and bridges. In 1866, the City Commissioner suggested construction of a stone bridge to carry Madison Street and three years later, reported erection of a "substantial" 40-foot stone bridge on Wilkens Avenue over Gwynns Run (City of Baltimore, City Commissioner 1866:250; 1869:376). In 1901-1902, the city built the present Boston Street Bridge, a masonry arch constructed of brick, to carry heavily traveled Boston Street and a railroad from the industrial district of Canton (Baltimore City Chief Engineer 1902).

The Good Roads movement of the late nineteenth and early twentieth centuries in Maryland fostered renewed interest in the preservation of the older stone arch highway bridges of the state, many of which had fallen into disrepair. The 1899 comprehensive report of the Highway Division of the Maryland Geological Survey noted how stone arch deterioration had been caused by "the weather and in part by willful destruction." Moisture penetrating the bridges often froze, causing "with the frost, a perceptible bulging and cracking of the walls." The 1899 report noted the four-arch "Jug Bridge" over the Monocacy as an example of such bulging problems, and observed that the parapet walls of the Casselman River Arch and the Cabin John Aqueduct Bridge were both in decayed condition (Johnson 1899:206-207). After purchasing nearly 190 miles of old turnpike right-of-way in 1910 and 1911, the State Roads Commission implemented a program to begin "the saving of the old stone arches and similar structures existing on these former turnpikes," noting that many of the bridges were "important and valuable both physically and historically" (Maryland State Roads Commission 1912b:80). Between 1908 and 1911, the State Roads Commission acted to save those bridges "most likely to fail and to permit probably the saving of all the rest" (Maryland State Roads Commission 1912b:80).

Maryland's historic stone arch bridges include a range of outstanding extant examples, reflecting primarily the early nineteenth century emphasis on the development of turnpikes, canals, and railroads for the state. Among the bridges are a number that are nationally significant, such as the 1813 Casselman River stone arch on the National Road, the 1829 Carrollton Viaduct on the old main line of the Baltimore and Ohio Railroad, and the 1835 Thomas Viaduct on the Washington Branch of the same railroad. A large number of stone arch turnpike bridges, both single-span and multiple-span, have also survived. Many original stone arch bridges and aqueducts likewise exist along the right-of-way of the Chesapeake and Ohio Canal, and there is also a historic resource of national importance in the Cabin John Aqueduct (or Union Bridge), a Roman arch built in the 1857-1864 period by the federal government for the Washington water supply system in the midst of the Civil War. A concise description of the major types of significant stone arch bridges found in Maryland, with some discussion of specific examples, serves to document the state's remarkable built heritage in this bridge form.