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1:30

WATER SUPPLY AND THE EARLY DEVELOPMENT OF LEXINGTON, KENTUCKY

GARY A. O'DELL

> [A city should] as far as possible have its own plentiful supply of waters and springs, and if it does not, such a supply has been invented by building a large number of big receptacles for rain-water.... For it is the things which we use most of all and most often for our bodies that make the greatest contribution to our own health; and the influence of waters and of air has such a nature. Wherefore, in cities of sound wisdom, if all the springs are not alike in purity and there is not a large number of them, water-supplies used for drinking and those put to other uses must be kept separate.
>
> Aristotle[1]

Water has always been essential for civilization, and its availability remains a primary factor in community development. The cultural development of the Old World took place along seacoasts and great rivers, and this was paralleled in the New World. The abundant waters of the New World encour-

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1 Aristotle, *Politics*, VII. x. 2-3.

aged agriculture; rivers were highways to the interior. Water later supplied power to operate mills and factories. Most major communities in America are located by the navigable waters of oceans, lakes, and rivers.

Kentucky, though not a large state, possesses more miles of rivers and streams than any other state except Alaska. In certain regions of the state, however, few large surface streams exist because of the local geology. Even so, many Kentucky communities were established in these regions. The eighteenth-century pioneers who chose the sites of future towns made use of a less visible source - groundwater. Nearly fifty percent of Kentucky has limestone bedrock at or near the surface. Slightly acidic rainfall, increasing in acidity as it percolates through the soil layer into the bedrock, gradually dissolves the limestone. The naturally existing networks of fractures in the limestone are enlarged through solution. Consequently, underground conduits serve in place of surface streams to carry water from higher to lower elevations. This groundwater ultimately discharges from springs. Such terrain is referred to as "karst." The limited development of surface drainage and such features as sinkholes, caverns, and springs characterize karst. Kentucky's pioneers settled near significant springs to be assured of a plentiful water supply. Many Kentucky communities owe their origins to large springs.[2] Spring water was preferred over water from any other source.

For more than a century, groundwater from springs and wells that tapped underground aquifers supplied water for Lexington and other Kentucky communities. During the pioneer era, the water-supply spring was a major focus of activity in many communities; it influenced the town's layout and determined its potential for growth. As the state became heavily settled during the nineteenth century, groundwater

2 Examples of some towns and cities in the Bluegrass region that were founded by springs include Boonesborough, Georgetown, Harrodsburg, Lexington, Stamping Ground, and Versailles.

became less desirable as a primary water source. Community growth, coupled with ignorance of disease causation, led to water-borne epidemics. Following the Civil War, an understanding of the relation between contaminated water and illness made people wary of the underground supply. Further, it became apparent that the capacity of local groundwater supplies was generally insufficient for the needs of an increased population. When Kentucky communities were forced to seek other water sources, they built reservoirs and dammed watercourses. In Lexington, population center of the Bluegrass karst region, crisis prompted the transition from groundwater to surface water late in the nineteenth century.

Kentucky's numerous springs that flowed from the widespread limestone regions impressed the first explorers and surveyors. Many became well-known landmarks as the frontier was settled,[3] but the springs had also been familiar to the Indians who had hunted, fished, and farmed in the region before the pioneers arrived. Large springs were favorite campsites for whites and Indians, and some were sources of mineralized water that could be boiled down to yield salt.

In the first years of settlement, the pioneers built fortifications for defense. In Kentucky colonists usually built forts in places which were desired as town sites. These town forts, often very simple structures, were not constantly manned by soldiers but rather by the citizenry as occasion demanded. Many of the inhabitants lived inside the forts, but a considerable number made their homes outside. When danger increased during Indian conflicts, forts received refugees from miles around. Weakly defended communities would be completely abandoned.

These fortifications were usually situated close to springs. In nearly every case the springs were left outside in

3 A somewhat standardized terminology became established in early Kentucky deeds to describe various types of springs and other karst features. "Blue hole," "cave spring," and "sinking spring" refer to specific types of springs.

order to prevent pollution of the water supply, although this goal was not always attained. On a visit to Harrodsburg in February 1780, Colonel William Fleming described the condition of the community's water supply:

> The spring at this place is below the fort and fed by ponds above the fort so that the whole dirt and filth of the Fort, putrefied flesh, dead dogs, horse, cow, hog excrements and human odour [*sic*] all wash into the spring which with the Ashes and sweepings of filthy Cabbins, the dirtiness of the people, steeping skins to dress and washing every sort of dirty rags and cloths in the spring perfectly poisons the water and makes the most filthy nauseous potation of the water imaginable and will certainly contribute to render the inhabitants of this place sickly.[4]

George W. Ranck asserted that at Lexington the spring used as a water source was "embraced within the walls of the stockade, and supplied the entire garrison with water."[5] This assertion is also made in other histories. However, an examination of contemporary accounts indicates that the practice of leaving the water source outside the walls was repeated at Lexington when the fort was built. Two early sketch maps of the fort clearly show that the spring was located outside the stockade.[6]

4 William Fleming, "Col. William Fleming's Journal in Kentucky from Nov. 10, 1779, to May 27th, 1780," in Newton D. Mereness, ed., *Travels in the American Colonies* (New York, 1916), 630. Colonel Fleming was a member of the Virginia Land Commission, having traveled to Kentucky to help untangle conflicting land claims.

5 George W. Ranck, *History of Lexington, Kentucky: Its Early Annals and Recent Progress* (Cincinnati, 1872), 24.

6 Sketch map accompanying interview with Martin Wymore (undated), Draper Collection, 11CC130; Sketch map accompanying Joseph Collins interview (1841), ibid., 12CC101. The latter sketch and a transcription of the Collins interview may be found in Bettye Lee Mastin, *Lexington 1779* (Lexington: Lexington-Fayette County Historic Commission, 1979), 22 (map), 49-102 (interview). There are some opposing secondhand early accounts of the situation of the public spring. "It is within my recollection that they used to point out the place where the fort was, and these springs were therefore seen to be included," interview with Mr. and Mrs. R. Pindell (undated), Draper Collection, 11CC187. William A. Leavy, a longtime resident of early Lexington, also stated that the spring was within the fort in his "Memoir of Lexington and Vicinity," *Register of the Kentucky Historical Society* 40 (1942):122 (hereafter cited as *Register*). However, Leavy did not arrive in Lexington until 1787 or 1788, and by this time the fort had been dismantled. I believe that the available evidence indicates that the spring was outside the stockade.

The vicinity of the future city of Lexington was explored in June 1775 when a party of surveyors came up a branch of Elkhorn Creek and camped at a particularly attractive spring, the identity of which is not now known for certain. The surveyors attempted no settlement at the time; Indian attacks forced many settlers to abandon their holdings temporarily and seek safety in the forts. In mid April 1779 Colonel Robert Patterson set out from the fort at Harrodsburg, thirty miles away, to establish the first fort north of the Kentucky River. With a party of twenty-four men, he reached the intended site on 16 April and camped at a large spring that emptied into the middle fork of Elkhorn Creek.[7]

This spring was previously known to Patterson. He had built a small hut by it in 1776 and had planted some crops. While recovering from wounds at his Pennsylvania home early in 1777, he described the location of the spring and hut so well to his brother William, who was about to set out for Kentucky, that he had no trouble finding it.[8] A few months later Robert made the trip to Harrodsburg. He met William there and with "a small armed party" went on to his cabin at the Lexington spring and "raised a small crop of turnips from seed."[9] When Patterson was ordered by Virginia to pick a site for a fort north of the river, he knew where to go.

On 17 April construction of the blockhouse began. In locating the fort with respect to the spring, Patterson no doubt recalled the appalling situation in Harrodsburg, and he was determined to avoid making the same mistake. The first tree

7 Collins interview, Draper Collection, 12CC65; William H. Perrin, ed., *History of Fayette County, Kentucky* (Chicago, 1882), 225. This was a different spring from the one near the surveyors' camp in 1775.

8 Catherine Patterson Brown, daughter of Colonel Robert Patterson, in Charlotte Reeve Conover, *Concerning the Forefathers* (Dayton, 1902), 143-44. Her recollections date from 1855.

9 Robert Patterson, autobiographical sketches 1816 and 1826 [as told to Catherine Brown] in ibid., 163.

was cut by Josiah Collins, a burr oak two feet in diameter that stood at the head of the spring; when trimmed, the log was used in the foundation of the blockhouse.[10] The blockhouse and spring were located near what is now the southwest corner of Mill and Main streets; the spring discharged into the now-covered Town Branch that runs beneath present Vine Street. By April 1780, a stockade, which enclosed twenty-two cabins, had been erected a short distance north of the spring. The cabins were built so that the two outer rows formed part of the stockade walls with pickets filling spaces between. The land that lay between the fort and the spring was cleared of trees and brush so that rifle cover could be provided for those who carried the water.[11]

The Public Spring, as it came to be called, supplied water for the fort; it continued to do so for many years after the Indian alarms ceased and the community expanded well beyond the bounds of the fort. Attempts were continually made to improve the spring as the needs of the town increased. This was done originally by clearing out the opening of the spring. The first major attempt to improve the spring apparently took place in 1783. A resolution of the town trustees in December 1782 called for "every freeholder of Lexington, living on the north side of the branch, [to] meet on the 2nd day of January next at the Springs to assist in availling the same."[12] This and other early notices indicate that the main town spring may originally have had multiple adjacent outlets. Martin Wymore, an early resident, observed that they "dug that in farther, and more, and it got stronger, as they went farther into the bank."[13]

10 Collins interview, Draper Collection, 12CC65.

11 For an excellent account of the founding of Lexington, see Mastin, *Lexington 1779*.

12 Lexington town trustees, *Minute Book 1781-1811*, 15, resolution, 12 December 1782, typescript at the Kentucky Historical Society.

13 Interview with Martin Wymore, Draper Collection, 11CC131.

When the stockade was finally torn down, more permanent improvements were made. The spring was dug even deeper and a stone enclosure was built about it. This work was undertaken by Henry Marshall in 1792 and 1794, for which he was paid two pounds, six shillings, and nine pence out of the public funds.[14] In 1790 the Town Branch itself, which had zigzagged past the overlooking fort, was straightened by order of the trustees. A canal was cut through the Commons and "a row of lively locust trees" planted along both banks.[15]

The rapid growth of Lexington caused problems as use of the spring increased rapidly not only by residents but also by rural folk and by travellers. As Wymore recalled, at first, "There was but the one spring, and altho 40 persons, or 50 only, used to attend, the townsmen had to go and bring up all the water they wo'd need, bef these persons sh'd come, for the spring wo'd be muddied by them so as to be unfit for use."[16]

The Public Spring was the main source of water, though it was not the only spring in pioneer Lexington. Many other springs that were used by the early residents of the community formed a line that was said to extend the length of Main Street. These secondary springs, however, apparently had insufficient flow when the fort was first constructed. Reliance upon a single source was a major problem, and the citizens set about digging at all the wet-weather seeps along the banks of the Town Branch. These efforts were successful as "the seeps ... gradually opened, and new springs broke out" along the north side of the branch.[17]

One of the first acts of the Lexington settlers was the

14 The town trustees passed a resolution on 10 November 1787 to "procure hands to have the public springs put in good order by having a wall built of stone around it equal to thirty square and four and a half feet high...." *Minute Book*, 32, also 77, 84, orders of 2 January and 13 May 1795.

15 *Minute Book*, 33, 44, orders 7 March 1788 and 3 July 1790.

16 Wymore interview, Draper Collection.

17 Ibid.

construction of a small log schoolhouse close to the fort. It was completed in 1780 at a time when the threat of Indian attack was still very real. The school stood at the western edge of the public square now occupied by the Fayette County Courthouse. A good spring nearby became Lexington's second public water supply.[18] The bridge reported to be at Main and Mill streets probably crossed the stream from this spring.[19]

By order of the trustees in 1789 Moses Patterson and Alexander Adams cleaned out a spring on Lower Street and built a wall around it.[20] Spring Street is said to have derived its name from a spring located under a house near the intersection of Spring and Main streets.[21] In 1801 the trustees paid a bill submitted to them for a cart and horse employed in filling this spring.[22] Another spring was located across the Town Branch southwest from the Public Spring.[23]

The new springs opened up along the banks of the Town Branch eased the demand upon the Public Spring for a few years, but the problem of keeping the springs clean remained. During the summer of 1790, the town trustees issued orders that "the public spring on Main Street and the one near the school house, no longer be used as washing places."[24] Apparently no one paid much attention to this notice for in July 1795, the trustees threatened to "prosecute anyone doing washing at the public spring."[25] They also appointed men to supervise the use of the spring. Henry Marshall and Benjamin S. Cox were appointed in August 1795 to supervise its use, and similarly Marshall and George Teagarden were given supervision of the schoolhouse spring.[26] Expenses for maintenance and improvements to the Public Spring and lesser springs were also allocated out of the town budget. Improvements consisted of walls or fences, catchment basins, troughs, and even wooden plumbing.[27]

The trustee minutes for 7 October 1805 reveal that Englehart Yieser had submitted a proposal to use the surplus water from the Public Spring by laying pipes to feed into a large trough for horses.[28] The pipes were made from logs that had been hollowed by burning through the interior with a red-hot iron rod. Some log pipes may have also been made by boring through the center with a long auger. Each log was tapered at one end to fit snugly into its neighbor and form a continuous run of pipe.

In April 1981, during excavations for the new Vine Center in downtown Lexington, several log pipes about twenty feet long were uncovered. The pipes were in excellent condition; they had tapered ends, and the interiors showed signs of charring.[29] An extensive plumbing system could be constructed

18 Collins interview, Draper Collection, 12CC73; Minute Book, 92, order 3 August 1795; Perrin, *Fayette County*, 95, 291; Ranck, *History of Lexington*, 39, 97.

19 Bettye Lee Mastin, "Town Branch and Water Street," in Barbara Sutton, ed., *Lexington as It Was* (Lexington, 1981), 37.

20 *Minute Book*, 38, order 4 July 1789. Lower Street, running between Main and High, later became Patterson Street.

21 Leavy, "Memoir of Lexington," 324.

22 *Minute Book*, 174, order 7 September 1801; Perrin, *Fayette County*, 280.

23 "The man who lived on the corner of Broadway and Water Street (S.E.) says the ground on Water Street is all made - 10 feet. He has been there 10 years. There is a spring on his lot about 140 feet from Broadway and about 53 feet from Water St. When he came there - the bank went down steep into this spring, as into a deep hole. He has had it walled up like a well. There is in the bottom, on the south side. . . a piece of timber, which I believe was to keep the earth from all falling in on the spring, and which he first built his wall upon. This spring is said to have sunk in the ground." Memorandum, Draper Collection, 11CC202.

24 *Kentucky Gazette* [Lexington], 15 August 1790.

25 Ibid., 3 July 1795.

26 *Minute Book*, 92, order 3 August 1795.

27 Ibid., 77, 127, orders 2 January 1795, 7 August 1797.

28 "Englehart Yieser's Proposals," Minute Book, 267-68 with resolution 7 October 1805. Additional references to the town springs of Lexington, not otherwise herein cited, may be found in the trustees' *Minute Book*, 69, 102, 186, 228, 241, 276-79, 281-82, 321 and in *Certificates of Town Lots in Lexington*, typescript, Kentucky Historical Society, 72, 276-77.

29 Bettye L. Mastin, "Modern Earth-Moving Equipment Uncovers Part of Lexington's Past," Lexington *Herald-Leader*, 14 April 1981; communication from Battalion Chief Ron Meadows of the Lexington Fire Department, 1990. Chief Meadows is responsible for the rescue of two of these log pipes from the 1981 construction site. One is presently on display at the Fire Training Center on

of these wooden conduits.

The public springs were supplemented for some householders by smaller springs on their own properties. A spring, assuring the owner of an abundant supply of what was believed to be the very purest water, always enhanced the value of property. Real-estate advertisements of the period always emphasized the importance of springs. The 1804 advertisement of John Bradford in the *Kentucky Gazette*, which stressed the presence of two good springs, is typical:

> [O]n that valuable LOT on Main Street in the town of Lexington, now occupied by the Subscriber, fronting on Main Street fifty feet, and 214 1/2 feet back to Water Street. On this lot is...A BRICK SPRING HOUSE, 20 feet by 10, in the floor of which rises 36 [inch] stream of very cold water, and which never fails in the driest season. . . . In the back yard is a never failing SPRING of cold water, exclusive of what rises in the spring house, and is equal to any in the State.... About half the lot was originally wet and unfit for cultivation, but has been reclaimed by laying on it upward of 500 loads of choice soil, and is now in excellent condition for a garden.[30]

In the early 1790s William Leavy had purchased a lot on the southwest corner of Main and Mill streets, and this lot, like the Bradford lot, also contained two springs. Leavy built a sturdy brick springhouse over the best spring which was two stories high with a second-floor smokehouse.[31] All springs were

Old Frankfort Pike and the other at the offices of the Kentucky-American Water Company on Richmond Road in Lexington.

30 *Kentucky Gazette*, 24 April 1804. The notice stated that "36 streams of water" were present in the springhouse. This seems to be a printing error; it is far more likely to have been a thirty-six-*inch* stream from the spring. The Bradford springhouse was just above the Public Spring; both properties were part of in-lot 43 of the original plat of the town. The town trustees granted part of this lot to Bradford in July 1787; by this time the old fort had apparently been dismantled. Bradford was prohibited from undertaking any improvements that might harm the nearby Public Spring. *Minute Book*, 30-31, order of 28 July 1787; See also Charles R. Staples, *The History of Pioneer Lexington* (Lexington, 1939), 22.

31 Leavy, "Memoir of Lexington," 323; *Kentucky Gazette*, 7 December 1793. The efforts of the settlers in digging out the seeps on the bank of Town Branch were evidently very successful. Three substantial springs were crowded into

advertised in the *Kentucky Gazette* as "never failing."

Even the locations of roads were influenced by the presence of springs as indicated by a February 1811 entry in the Fayette County Order Book concerning the re-routing of the Frankfort Road. The new route was recommended because there were "two springs of running water convenient to the new proposed road and the ground rather better than the old way."[32] A drink of cold spring water was always welcome to the dusty traveler on horseback.

Property became more valuable in Lexington as the town continued to grow, and although many lots and houses were advertised to include "a spring of cold water," other springs were filled in so that the land might be used for other purposes. The Public Spring, however, continued to be regarded as a valuable asset. In 1807 William W. Worsley subleased the Public Spring lot from Joseph Charless, who had obtained an eighteen-year lease from the town trustees at an annual rent of eighty dollars. When Charless transferred his lease to Worsley, the circuit court ruled that the action would not "affect the privileges granted Englehart Yieser by the Trustees of Lexington to convey water from the Public Spring."[33]

The Public Spring lot was eventually sold by the trustees. Increasing land values caused it, like the lesser springs, to be covered over. As late as 1899, however, it was reported that the spring, though walled up, could still be seen

the east side of this block; two had large brick springhouses, while the third served as the public water supply.

32 Route recommendation for Old Frankfort Pike, 15 February 1811, *Order Book 2*, 339, Fayette County Courthouse Annex (hereafter FCCA).

33 Lexington Trustees to Joseph Charless, 23 February 1807, *Circuit Court Deed Book C*, 201, FCCA; Joseph Charless to William W. Worsley, 4 October 1807, *County Court Deed Book C*, 171, FCCA. Both deeds refer to an earlier transaction of 21 February 1806, Caleb Williams to Joseph Charless, transfer of Public Spring lease. The original deed could not be located but is quoted in C. Frank Dunn, *Old Houses of Lexington* (2 vols.; unpublished typescript; undated, Lexington Public Library), 1:137-38.

beneath the rear of a wholesale grocery.[34]

Nothing was feared more than fire in early Lexington because the town was constructed mostly of wooden buildings separated by narrow walkways. The wood-and-mud chimneys, vigorously condemned by the town trustees, were particularly dangerous. Lexington was not located on any major waterway. The Town Branch usually thinned to a trickle during the dry summer months, so that water for firefighting had to be obtained from the town springs. Each householder and business was required to keep one or more fire buckets on hand, the number depending on the value of the property; these were inspected at regular intervals.[35] When fire broke out, everyone was expected to carry water from whatever source was available. Most often a double line was formed with buckets passed from hand to hand from water to blaze and back again. The hollow logs that directed overflow from the Public Spring were pierced by holes at intervals, each fitted by a wooden stopper. Many buckets could be filled simultaneously; this is the origin of the modern term "fire plug."[36]

As the town grew, dependence on springs for firefighting decreased as wells were dug and cisterns were built. The Lexington Fire Company No. 1 is believed to have been organized in 1790.[37] In January 1812, the Union Fire Company received permission from the trustees to excavate "two reservoirs on the public square for the purpose of holding Water in case of fire to be covered over, each to be from twelve to fifteen

34 Anonymous, "Colonel John Todd: Describes how he built the Lexington fort in the spring of 1782," *Kentucky Historical and Genealogical Magazine* 1 (1899): 89-90.

35 *Minute Book*, 291-92, ordinances 25 June, 7 July 1806; 330-31, revised ordinance 17 February 1808; 366, revised bylaws, 5 June 1809. See also Staples, *Pioneer Lexington*, 208-209.

36 Mastin, "Equipment Uncovers Lexington's Past." See also John B. Clark, "The Fire Problem in Kentucky, 1778-1865," *Register* 51 (1953): 98-103.

37 *Kentucky Gazette*, 23 April 1791. This notice concerned a routine meeting of the fire company. See also Clark, "Fire Problem," 103-22.

feet wide and forty feet in length."[38] Though houses were being constructed of less flammable materials, the danger of fire remained acute in Lexington through most of the nineteenth century.

By 1810 much of the Lexington water supply was obtained from wells, although some springs continued to be used. John Robert Shaw, an itinerant well-digger in early Lexington, advertised his profession with doggerel:

> John R. Shaw, who now intends
> To blow up rocks and dig in wells
> Can water find by the new art
> So well the fresh, so well the salt[39]

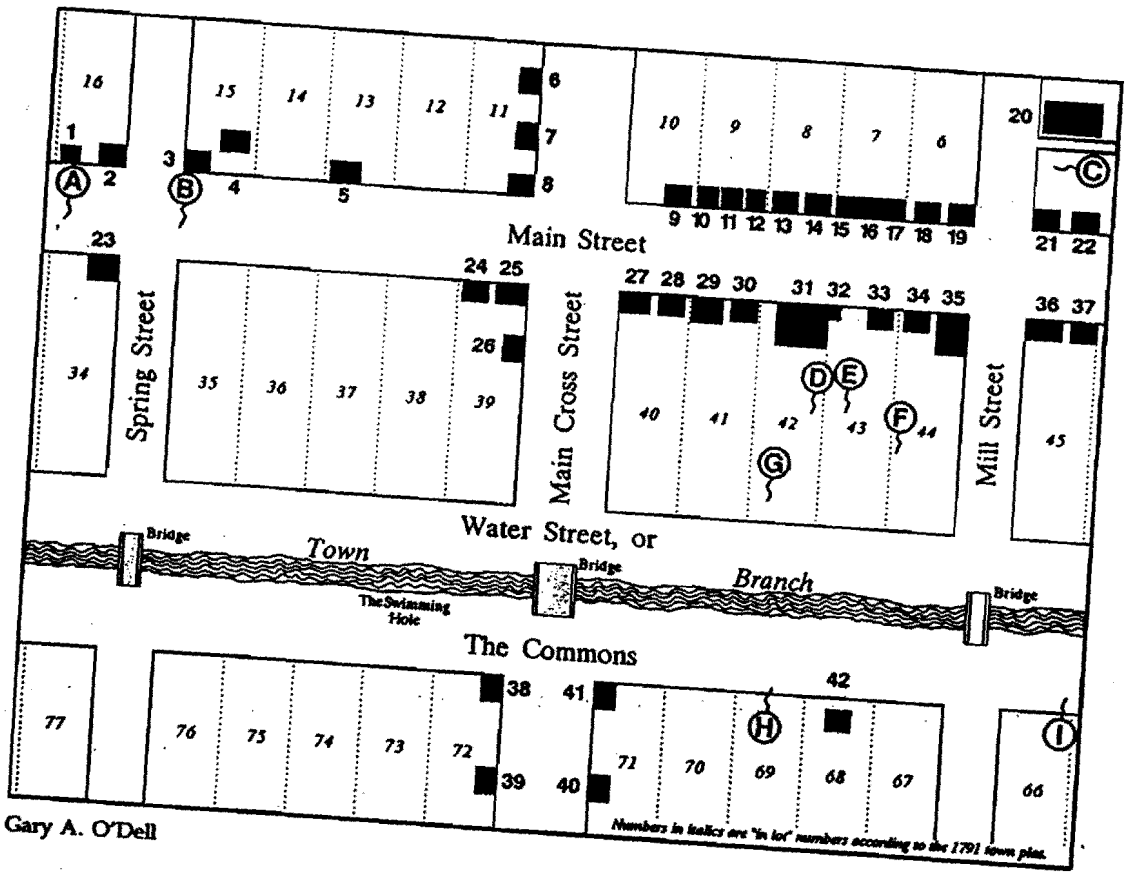
Shaw kept a meticulous record of his accomplishments, recording that he had dug or blasted one hundred and fifty-seven wells in Kentucky before 1807.[40] In August 1810 the well-diggers of Lexington held an organizational meeting and published a schedule of prices in the *Kentucky Gazette*. For a well six feet in diameter, the set price for excavating through the soil to bedrock was two shillings and sixpence per foot, increasing to eighteen shillings per foot once hard rock was encountered to a depth of thirty-five feet. The rate was higher for wells deeper than thirty-five feet. Construction of an interior rock wall to prevent soil from caving in cost two shillings per foot. Appended to the rate schedule was a vivid account of the hazards of the work:

> This perilous and dangerous profession of DIGGING WELLS is, whilst we are toiling in the rock, attended with danger and hazzard. The well digger is every day in imminent danger of losing a leg or an arm, and perhaps his life--such

38 Order of 14 January 1812, *Order Book* 2, 467, Fayette County Court, FCCA; *Kentucky Gazette*, 11 January 1812. The Union Fire Company was organized about 1800.

39 *Kentucky Gazette*, 6 December 1803, 6 February, 20 May, 25 August 1806.

40 John R. Shaw, *A Narrative of the Life and Travels of John Robert Shaw* (1807; reprinted in Louisville, 1930), 192-97.



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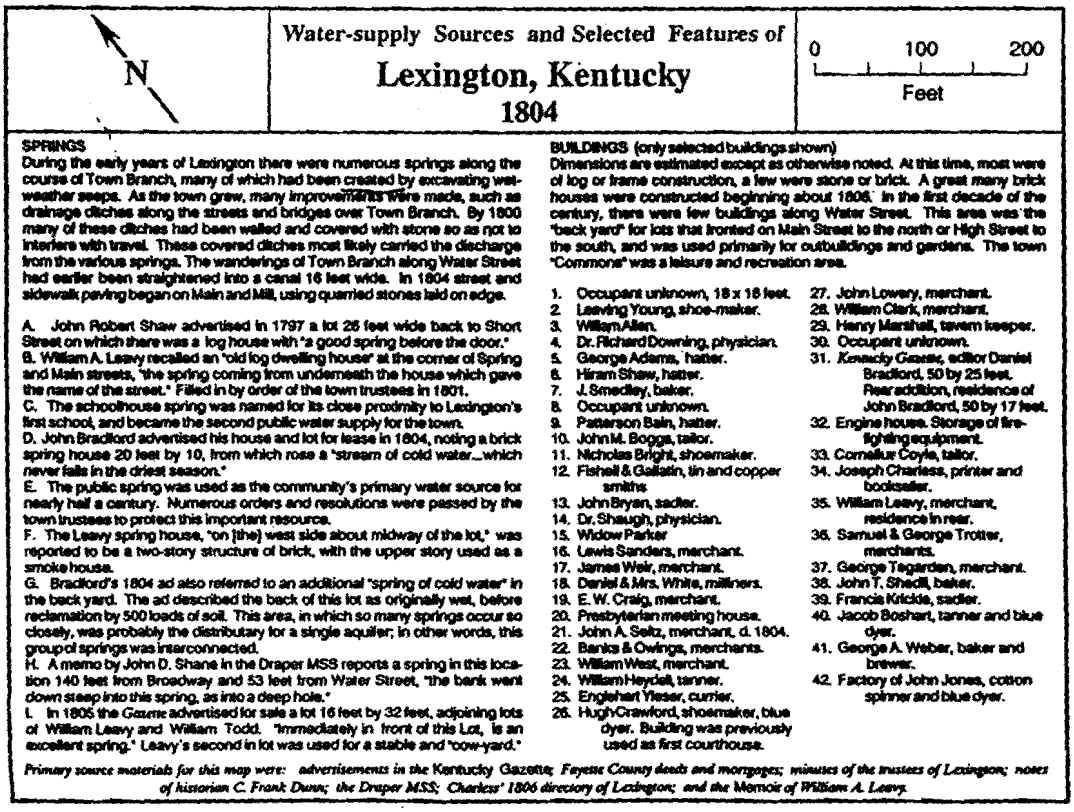

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> as wells caving in, rocks falling down, both to his manifest destruction or misfortune.... If a soldier is wounded in the field of action, he can appeal to the government of his country for relief--but if a poor, unfortunate well-digger loses a leg or an arm, the clemency of his fellow citizens is the most he can expect. His days will in all probability terminate in extreme poverty and distress.

The citizens were asked particularly to note "the various and numerous wounds and broken bones of *poor old Shaw*" even as the mishaps of several other well-diggers were described.[41] Shaw evidently had more than his share of misfortune, for during his colorful career he was "blown up" no less than four times.[42]

In 1880 Robert Peter declared that, "Experience has already shown that in almost any part of the city water may be obtained in wells, varying in depth according to locality from six to eight down to forty to fifty feet."[43] In 1892, long-time resident Dennis Mulligan recalled the locations of twenty-five abandoned wells and cisterns that had formerly been used by the residents.[44] Some, he noted, were "blowed wells" and thus may have been excavated by John Robert Shaw or his fellows earlier.

In the present era, excavations for modern buildings continue to unearth traces of Lexington's early water supply. During the construction of the new Transit Center on Vine Street in 1991, two of the old hand-dug wells of the city were uncovered. In one of the wells a wooden pump was found

41 *Kentucky Gazette*, 21 August 1810. The notice was signed by John Robert Shaw, Jesse Callaway, Stephen Smith, George Rhodes, John Bell, Samuel Taylor, D. M'Coye, and Wm. Kinney. Other former well-diggers mentioned, no longer able to work because of injuries, were a Mr. Senate, Robert Parks, and "the unfortunate negro Weeden, [who] lost an eye."

42 Shaw, *A Narrative*, 198-200.

43 "The Water Supply," Lexington *Daily Transcript*, 15 July 1880, unsigned, attributed to Dr. Robert Peter.

44 Dennis Mulligan, "The Old Wells," Lexington *Morning Transcript*, 6 December 1892. Irish immigrant Dennis Mulligan (1817-1901) was a prosperous grocer, city councilman, and the main political boss during Lexington's era of machine politics from 1870 to 1880. See James D. Bolin, "Bossism and Reform: Politics in Lexington, Kentucky, 1880-1940" (Ph.D. diss., University of Kentucky, 1988).

which was in reasonably good condition.[45]

Although the identity of the craftsman who built this particular pump cannot now be determined, Samuel Van Pelt was a well-known pump-maker in early Lexington. The first evidence of his activity is a record of a payment he received in 1798 from the town trustees for the repair of a pump on Main Street.[46] During the summer of 1804, Van Pelt placed an advertisement in the *Gazette* to inform the public that he:

> continues carrying on the Pump Making in all its common useful branches, on the shortest notice, and on reduced prices; as also conveying water under ground, through pipes, for the sake of distilleries, running fountains, &c.[47]

The 1806 directory of Lexington listed him as a "pump maker" on Main Street.[48] Wooden pumps were evidently still used occasionally in the late nineteenth century, for city councilman Dennis Mulligan, believing them to be cheaper and more durable than iron pumps, recommended that they be installed during a drought in 1881.[49]

Public sanitation in early Lexington was practically nonexistent. Privies were built in the most convenient locations, often adjacent to wells, springs, and streams. They contaminated groundwater through seepage and by overflow during heavy rains. The germ theory was virtually unknown. Although bacteria had been discovered, it was not known that pathogenic bacteria found in human excrement could cause illness. People believed that if water looked clean, it was safe to drink, a misconception which has not been entirely dispelled

45 Bettye Lee Mastin, communication, 1993.

46 *Minute Book*, 133, 17 January 1798.

47 *Kentucky Gazette*, 14 August 1804.

48 J. Winston Coleman, Jr., *Lexington's First City Directory Published by Joseph Charless for the Year 1806* (Lexington, 1953), 7.

49 Frances L. S. Dugan, *Rainfall Harvest: Gilbert Hinds King and the Lexington Hydraulic and Manufacturing Company* (Lexington, 1953), 21. Dugan's excellent work concerning the establishment of the Lexington waterworks provides fascinating glimpses of life and politics in late nineteenth-century Lexington.

even today. Under such conditions, epidemics had repeatedly ravaged the crowded cities of Europe. It was merely a matter of time before pestilence struck the Kentucky settlements.

The Asiatic cholera, originating in India, was spread by ship to ports in the United States. It struck New York City in June 1832, and by late fall of the same year it had spread to the interior, including Louisville and Cincinnati. A few cases appeared at Lexington in November but with the onset of cold weather the disease vanished, causing little concern.[50] With the return of spring, however, cholera came to Maysville, and in the first week of June 1833 a few cases appeared in Lexington.[51] On 7 June heavy rains began, and soon the outhouses were flooded and their contents flowed into the streets and wells. The epidemic began.[52]

At the height of the epidemic, carts made the rounds of Lexington streets to collect the dead. Since coffins could not be constructed quickly enough, many were buried in mass graves. Nearly half the population of six thousand fled to the countryside or to such supposedly safe havens as the health spa at Olympian Springs. By the time the epidemic had run its course in late July, nearly five hundred had died.[53]

On 18 May 1849 the second cholera epidemic in Lexington appeared first among the inmates of the Lunatic Asylum (Eastern State Hospital).[54] Sanitary conditions at this institution were appalling. As the cholera began its deadly attack, memories of the horrors of the previous decade prompted the hasty exodus of fifteen hundred persons from Lexington. The second epidemic, like the first, waned after a few months,

50 Nancy D. Baird, "Asiatic Cholera's First Visit to Kentucky: A Study in Panic and Fear," *The Filson Club History Quarterly*, 48 (1974): 228-31.

51 Lexington *Observer and Reporter*, 5 June 1833; *Kentucky Gazette*, 22 June 1833.

52 J. S. Chambers, *The Conquest of Cholera* (New York, 1938), 158.

53 *Observer and Reporter*, 28 June, 6, 13 July 1833. See also Chambers, *Cholera*, 160-62, 165.

54 *Observer and Reporter*, 23 May 1849; Chambers, *Cholera*, 227-29.

leaving over three hundred dead.[55]

Prior to the 1833 epidemic, Lexington was thought to be the most healthful town in the state; its citizens were not particularly worried by the presence of cholera elsewhere. Even though filth and debris were thought to cause cholera, no serious efforts were made to clean up the town. Although medical knowledge was only slightly more advanced by the time of the second outbreak, dreadful memories of the 1833 epidemic prompted officials to take measures well in advance. Unfortunately, the cause was still unknown, and so nothing was done to prevent contamination of the water supply by sewage, though no doubt the city fairly gleamed from the scrubbing it received.[56]

In May 1849 the town board of health "examined the streets and alleys, supervised the cleaning of foul areas, and recommended that all cellars, alleys, yards, and streets be cleaned after each rainfall."[57] In January, Dr. Robert Peter had recommended that:

> The first object should, undoubtedly, be the removal of all filth, thorough cleaning, scouring, scraping; the drainage, or filling up with earth or broken rock, of all wet places, stagnant ponds, or filthy mud holes; strewing lime freely over the unclean surface, and in all open places where animal or vegetable substances might be in a state of decomposition.[58]

When the onslaught of the disease was at its worst, field artillery pieces, set up on the town's outskirts, were fired to rid the air of the cholera-causing miasma.[59]

55 *Observer and Reporter*, 20 June 1849; Nancy D. Baird, "Asiatic Cholera: Kentucky's First Public Health Instructor," *The Filson Club History Quarterly* 48 (1974): 330-31; Chambers, *Cholera*, 228-32.

56 *Kentucky Gazette*, 22 June, 6, 27 July 1833; *Observer and Reporter*, 12 May 1849; Baird, "Cholera's First Visit," 230; Chambers, *Cholera*, 175-76, 226, 228.

57 Baird, "First Public Health Instructor," 330.

58 Dr. Robert Peter, "Cholera Preventatives," *Observer and Reporter*, 24 January 1849.

59 *Observer and Reporter*, 2 June 1849.

Although there had been plenty of circumstantial evidence during the 1833 and 1849 epidemics indicating that contaminated drinking water was the cause of cholera, the relationship was still not understood. The *Covington Journal* came close to grasping the truth after the second epidemic when it observed that cholera did not seem to have been as severe in towns where the majority of the citizens consumed rainwater or where the drinking water had been obtained from the Ohio River.[60] Research published in 1855 by the English physician John Snow, following a siege of cholera in London, pointed to a water-borne origin for the disease.[61] When cholera struck Kentucky again in 1873, Lexington remained relatively unaffected because the source of drinking water had been changed. The increasing use of cisterns prevented contamination from groundwater seepage. Cisterns were constructed of concrete and collected rainwater free of dangerous pathogens. Presented with this evidence, and with recognition of the works of Joseph Lister, Louis Pasteur, and other leading proponents of the germ theory of disease, most physicians in Kentucky had become convinced by the fall of 1873 that cholera was spread by contaminated water.[62] There were no more major epidemics.

With the new understanding of disease, shallow wells were no longer trusted; most were abandoned. Water usage from all public wells, including about thirty in the business district, was discontinued. Shallow wells were far more susceptible to contamination than deeper ones, but the technology of the day did not permit deep boreholes to be made easily until after the Civil War.[63] Of the one hundred and

60 *Covington Journal*, 29 July 1854.

61 John Snow, *On the Mode of Communication of Cholera* (London, 1855), republished in Wade H. Frost, *Snow on Cholera* (New York, 1936), 15, 22-27, 38-40, 76, 109, 133-37.

62 Baird, "First Public Health Instructor," 340-41. See also S. N. De, *Cholera: Its Pathology and Pathogenesis* (Edinburgh and London, 1961), 9-19.

63 The technology for drilling water wells developed from efforts to extract commercial quantities of salt from saline wells during the early nineteenth century and also from the beginnings of oil exploration shortly before the Civil War. Both activities occurred in Kentucky. See Gustav Egloff, *Earth Oil* (Baltimore, 1933), 35-42; Paul H. Giddens, *The Early Petroleum Industry* (Philadelphia, 1974), 3-17; and Willard R. Jillson, *The Oil and Gas Resources of Kentucky* (Kentucky Geological Survey, series 5, bulletin 1; Lexington, 1919).

fifty-seven wells excavated by Shaw, the deepest was fifty-four feet; the average depth was only 16.7 feet.[64] Abandoning wells, however, eliminated the major source of water for the community. Kentucky's rainfall is seasonally variable, and the cisterns, while protecting the citizens from disease, were dependent upon rainfall and thus were unreliable sources for a growing city. Lexington's water supply soon became an issue of great importance.

In 1871 the editor of the *Kentucky Gazette* called for the mayor to appoint an engineer to study Lexington's water supply, but no action was taken.[65] Later in the year one of the council members proposed that the city purchase pumping equipment manufactured by the Holley Company and use the Maxwell Springs as a source;[66] again there were no results. The issue was raised once more by the local newspapers in 1874,[67] but as many proposals for other improvements were then under consideration, the waterworks campaign gained little support.[68]

In 1879 the issue became critical. In the spring several disastrous fires struck in rapid succession. The William Tarr distillery burned to the ground on 8 May; the blaze was followed on the very next night by a large fire elsewhere in the city.[69] In mid May the venerable Phoenix Hotel was destroyed by a great fire that threatened the downtown area as:

64 Shaw, *A Narrative*, 192-97.

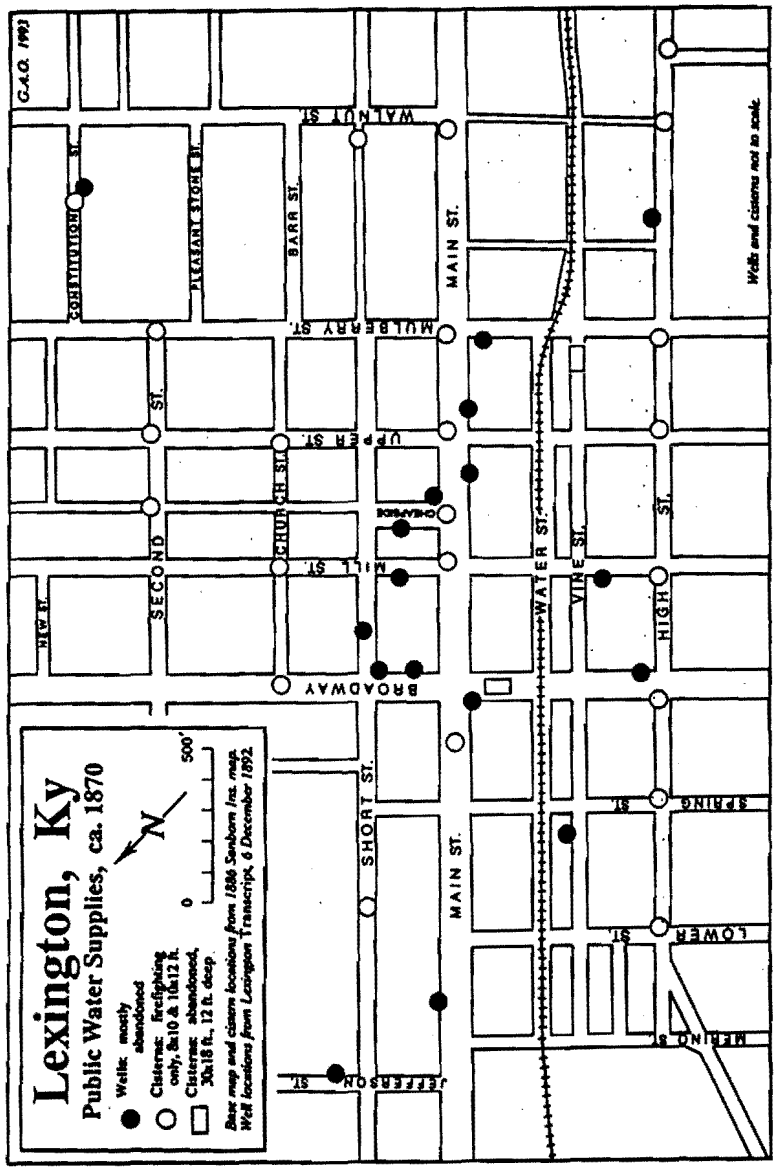
65 *Kentucky Gazette*, 23 August 1871.

66 Ibid., 9, 16 September 1871. Maxwell Springs was a series of springs just southeast of pioneer Lexington near the home of pioneer John Maxwell. Most were on the south side of present-day Euclid Avenue and today are buried under buildings and grounds of the University of Kentucky.

67 Ibid., 30 September, 3, 7, 10, 14 October, 11 November 1874.

68 Dugan, *Rainfall Harvest*, 3-6.

69 *Kentucky Gazette*, 10 May 1879; Dugan, *Rainfall Harvest*, 10.



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> cistern after cistern went dry to the tune of the shrill "out of water" whistle of impotent fire engines... Firemen rushed equipment to a fresh cistern nearby, but after obtaining suction they discovered the hose was too short to reach....[70]

The summer of 1879 was marked by drought, and wells and cisterns began to go dry.

In this situation, newspapers again raised the issue of waterworks, and the subject was much discussed. It was well known that limestone strata beneath the city contained great reserves of water. Could they be used? Many people favored use of one or more of the larger springs for a municipal water-works. The cholera lesson had undermined faith in shallow wells, but spring water was still universally believed to be completely pure. The spring at Russell's Cave, Maxwell Springs, Ater Springs, and others were proposed, but the prime candidate seemed to be Wilson Spring.[71] At the time this large spring (McConnell's Spring) was owned by John S. Wilson and had acquired his name.[72] The Wilson Spring had supplied the water needs of the Headley and Farra distillery, built in 1858, until its destruction by fire in 1873; during the waterworks controversy the spring served the Blue Grass Pork House, a slaughterhouse of the Gilbert Company.[73]

An investigation was to be made by experts of Wilson Spring and other possible sources. As often occurs when large expenditures are proposed, political self-interest proved dominant. So it was in that summer of 1879 when leading newspapers squared off on opposing sides, each printing article after article laced with sarcasm and innuendo. The *Lexington*

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70 Dugan, *Rainfall Harvest*, 10-11; *Kentucky Gazette*, 10, 17 May 1879; Lexington *Daily Press*, 15, 16, 23, 25 May 1879.

71 Dugan, *Rainfall Harvest*, 11-13; Lexington *Daily Press*, 6 July 1879. Many people in Lexington believed that a vast subterranean lake lay beneath the city and that the springs were fed by it. In fact, groundwater aquifers in limestone bedrock consist of networks of fractures and solutionally enlarged conduits.

72 A. J. and M. J. Reed to John N. Wilson, 1 March 1859, transfer of lot containing the spring, *Deed Book* 35, 454, FCCA.

73 Perrin, *Fayette County*, 206, 209.

Daily Transcript supported a modern waterworks, while the editors of the venerable *Kentucky Gazette* strongly opposed any change or expenditure of public funds.

The editorial dispute warmed markedly in July. On 15 July an engineer from the Holley Water Works of New York examined the Wilson Spring. On the day of the inspection, the *Transcript* reported:

> [Wilson Spring] is a basin of water about one hundred feet in depth, and containing a great quantity of water, while a continual stream wells up. Sometimes hundreds of large and beautiful fish may be seen on it, and then they disappear again for weeks. The water is pure and clear, and just such as the citizens of Lexington would delight to have in their homes, and places of business. It is as cold as ice. The center of the spring has been sounded for hundreds of feet, and no bottom ever reached... All who have seen this wonderful spring agree that it is the outlet of a subterranean lake or river, and that an inexhaustible supply of water may be obtained from it.[74]

The next day the paper reported that the engineer had ascertained that Wilson Spring could sustain a city waterworks and provided an estimate for its cost.[75]

The rival *Gazette* had a markedly different opinion of the spring and expressed it on 19 July in a biting rebuttal. It reported that two gentlemen "of practical turn of mind" had determined that the supposedly bottomless Wilson Spring was no more than twelve feet deep.[76] The *Gazette* described the spring as, "A little rill scarcely sufficient to cleanse the filth out of the gutters on Broadway."[77] The *Gazette* perhaps summed up the prevailing attitude:

> It is not worthwhile to anticipate the propositions of visionaries, but for the present and years to come Lexington will

74 *Daily Transcript*, 15 July 1879.
75 Ibid., 16 July 1879.
76 The author has duplicated the experiment with a similar result.
77 *Kentucky Gazette*, 19 July 1879. The Lexington *Press* noted on 17 July that, "The Wilson spring is said to contain 'great big suckers' [fish] but the biggest suckers are not in the spring but about to get into it."

> have to be content with her cisterns and wells, of which she has a good supply, and if these do not suffice, let more be dug. Waterworks are a luxury for towns more wealthy than Lexington and more favorably situated, and where the authorities do not waste the public assets in foolish improvements that are no manner of public utility.[78]

For the time being the debate rested, for with fall rains the cisterns filled, and the issue no longer occupied much public attention.

Drought was not a problem in the summer of 1880, so while there was some newspaper debate, the question of a waterworks attracted little attention. Dennis Mulligan and his supporters controlled Lexington politically, and they vigorously opposed any increase in expenditures.[79] Even so, Dr. Robert Peter predicted that Lexington would need an abundant supply of water to attract industrial development. He proposed that a dam on the Kentucky River, eight to twelve miles away, would be the best way to assure water for an industrialized Lexington with a possible future population of up to 150,000. Dr. Peter grasped Lexington's future situation more clearly than many of his contemporaries.[80]

In 1881 events combined to bring the waterworks issue back into prominence. Lexington was struck by another series of terrible fires which were followed by one of the most severe droughts in memory.[81] Many of the previously abandoned wells were brought back into service,[82] although the *Daily Press* warned against their use by noting the appearance of typhoid.[83]

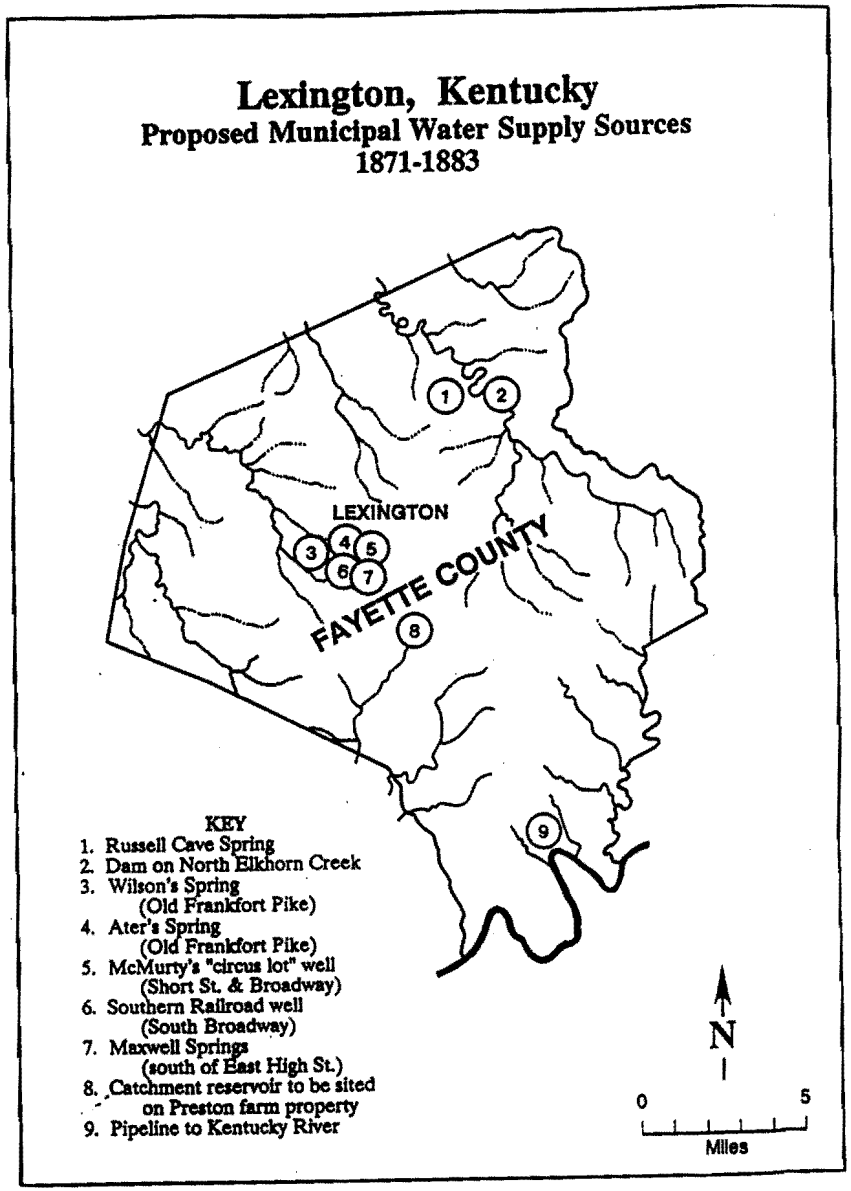
78 Ibid.
79 Dugan, *Rainfall Harvest*, 14-16.
80 *Daily Transcript*, 15 July 1880. Dr. Peter might well be considered the first Kentucky hydrogeologist. Among his accomplishments are detailed chemical analyses of many Kentucky springs.
81 *Daily Press*, 5, 16, 17, 21, 23 August, 7, 8, 10 September 1881; *Daily Transcript*, 11, 12, 15, 16, 17, 22, 31 August 1881.
82 *Daily Press*, 12, 28 August, 9 September 1881. In the 27 August edition, the *Daily Press* reported on a city committee's 26 August inventory of Lexington's old wells; forty-one of these abandoned wells were located in the downtown district.
83 *Daily Press*, 7 September 1881.

The wells began to fail as the summer wore on. Many people were forced to carry their drinking water more than a quarter of a mile.[84] Nearby Richmond restricted water use to drinking and cooking.[85] Experts investigated possible sources for a waterworks, primarily the large springs and an area of North Elkhorn Creek that might be made into a reservoir.[86] By this time both the Lexington *Daily Press* and the *Transcript* had become avid proponents of a pipeline from the Kentucky River to feed into a city reservoir.[87] The editor of the *Gazette*, however, grumbled that it was time for Lexington to forget this "waterworks foolishness" and be content with cisterns.[88]

The year 1882 began with the waterworks question still prominent and still unresolved. The proposed city charter for Lexington presented at Frankfort included a section allowing a waterworks to be built at a cost not exceeding $500,000; at the same time an attempt was being made to charter a private water company to be known as the Lexington Hydraulic and Manufacturing Company. Gilbert H. King of Lexington was the principal promoter of the company.[89] Although debate over the waterworks grew heated, Governor Luke P. Blackburn signed the bill to charter the company.[90]

The Lexington Hydraulic Company proposed to build a reservoir to catch rainfall. Opponents warned that a catchment

84 Ibid., 23 August 1881.
85 Ibid., 10 September 1881.
86 Dugan, *Rainfall Harvest*, 20-23.
87 *Daily Press*, 7, 16, 24 August 1881; *Daily Transcript*, 1881, various issues. While this approach was not adopted during the nineteenth century, the continued growth of Lexington and the severe drought of 1930 forced the construction of a pipeline to the Kentucky River. Additional pipelines were constructed over the next several decades, most recently after the drought in 1988. These pipelines provide Lexington's present water supply. Water-supply planners know that the river will be inadequate for the needs of the next century and that additional capacity must be sought.
88 *Kentucky Gazette*, around 26 August 1881, exact date unknown, quoted in *Daily Press*, 28 August 1881.
89 *Daily Transcript*, 22 April, 13 May, 27 June 1882.
90 Dugan, *Rainfall Harvest*, 23-25.



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dependent upon runoff would amount to little more than a "stagnant pond," whereas spring water was pure and fresh. The allusion to a "stagnant pond" was doubtless intended to stimulate unpleasant memories of the cholera epidemics in the lingering supposition that "miasmas of the air" caused the dread disease.[91]

Other opponents of the private company feared profiteering; still others remained adamantly opposed to any sort of waterworks, maintaining that if more water were needed, more wells should be dug.[92] There were those who claimed that it would be impossible to fill a reservoir in the cavernous region of Fayette County. Such skeptics were assured that the proposed site of the Preston Farm was "a fault or freak formation; under its sod lay a stratum of 'cold blue clay' which, because of its low absorption factor, would provide a fine bottom for the reservoir."[93] The farm was in nearly the only area of the county capable of supporting a large reservoir. The fault was the ancient Lexington Fault which bisects the county, and the "freak formation" was the surface of the impermeable shale and siltstone beds that had downdropped to the east as a result of the faulting.

Despite such assurances, however, the reservoir proposal still had to be approved by the city government, and, once again, no action was taken. The issue was still unresolved, and the waterworks issue carried over into 1883. During the summer of 1883, numerous fires struck Lexington, and yet again cisterns proved woefully inadequate. Just after midnight on 10 September, the stables of the Lexington Street Railway Company caught fire and were completely destroyed. Even more than by the loss of the rolling stock, the citizens were appalled by the loss of more than fifty horses and mules. The

91 Ibid., 39, 43, 46, 50.
92 Ibid., 43-50.
93 Ibid., 33. The Preston Farm was on the south side of the Richmond Road about three miles southeast from the Lexington Courthouse.

stench of burnt flesh permeated the area for days.[94] The *Transcript* reported that only "fifteen minutes after the suction was dropped into the cistern on the corner of Main and Dewees it was pumped dry." Firefighters then turned to the cistern on Dewees and Short, but it was also pumped dry.[95] In issue after issue the *Transcript*, the most active promoter of a modern waterworks, continued to berate the city council for its inactivity.[96] Then on 28 September, the insurance underwriters announced that all rates would be significantly increased because of Lexington's persistent problem with fires.[97] Responding to pressure brought by citizens thus assaulted in their pocketbooks, the waterworks committee invited submission of bids. On 4 November fire struck again. A livery stable on Short Street was destroyed, and once again the cisterns were pumped dry by frustrated firefighters. The city council met on the evening of 6 November. The waterworks committee reported that the reservoir plan of the Lexington Hydraulic Company seemed the best of all alternatives and recommended that a contract be made at once. The waterworks ordinance was passed by the council that very night. The *Transcript* cheered, "We've Got 'Em!"[98]

By October 1884 the dam for the first city reservoir was nearly complete. As fall rains began, the water level began to rise.[99] Early in 1885 the official ceremony of inauguration was held for new Lake Ellerslie. Within a few more months, a pumping and filtering plant was in operation, and the city was

94 *Daily Press*, 12, 19, 25, 26 September 1883; *Daily Transcript*, 11, 12, 13, 15 September 1883.
95 *Daily Transcript*, 11 September 1883.
96 Ibid., 15, 18, 19, 25, 27 September 1883.
97 *Daily Press*, 28, 29 September 1883; *Daily Transcript*, 28 September 1883.
98 *Daily Transcript*, 6, 7, 9 November 1883.
99 Lexington *Morning Transcript*, 8 October, 14, 16 November 1884; *Daily Press*, 2, 7 December 1884.

at last provided with a reliable source of water.[100] Over the next three decades, three more reservoirs were added to the catchment system.

For more than a century after its founding, Lexington had no municipal water supply to carry water to homes and businesses. The few public springs in use in pioneer times served as assembly points which drew residents to the source to carry water away. A very few persons possessed springs on their own property. As the population increased and the town was developed, wells were constructed. About forty such wells were considered public; these wells were used for firefighting, street-cleaning, and watering horses in addition to supplying the residents. The construction of a large number of private wells at homes and businesses occurred at the same time the public wells were built. Similarly, during the largely mid-nineteenth-century period of cistern building, a few large public cisterns were installed, but most cisterns served private households. Not until construction of the city waterworks based upon a catchment basin did Lexington have a truly public system.

Lexington's growth had far outspanned the imaginations of the founders. For the first century groundwater had been sufficient for the needs of the inhabitants; this is still true for a great many Kentucky towns. However, the rapid population increase in the late nineteenth century, coinciding with the American industrial revolution that continued at an accelerated pace in the twentieth century, had required major improvements in Lexington's water supply. Groundwater supplies (wells and springs) were largely abandoned, except for industrial use, following the terrible cholera epidemics in the mid nineteenth century and the increasing use of cisterns. Cisterns, however, served for only a short time as the primary public water supply because they depended on short-term

100 *The Kentucky Leader* [Lexington], 7 August 1889; Dugan, *Rainfall Harvest*, 71-72.

rainfall and had limited carryover capacity. The accelerating demands of urban and industrial growth finally led to the use of surface waters of large storage capacity and controllable quality. Following construction of the first reservoir, groundwater was not again used to any significant degree except in the rural areas of Fayette County. Considerations of water supply had helped determine the original town site and had later strongly influenced its physical structure and the growth and development of its population and industry. Water had shaped the very nature of Lexington.