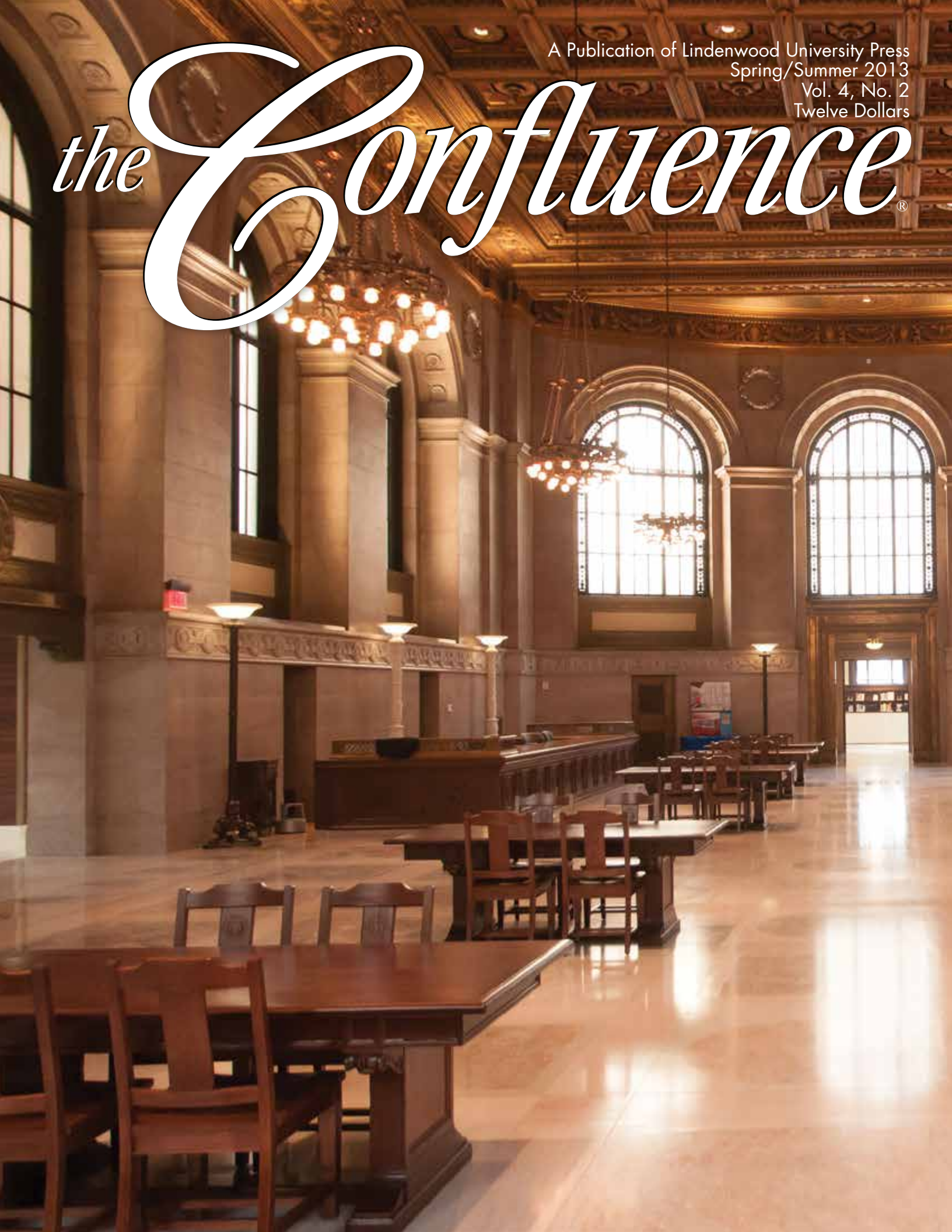
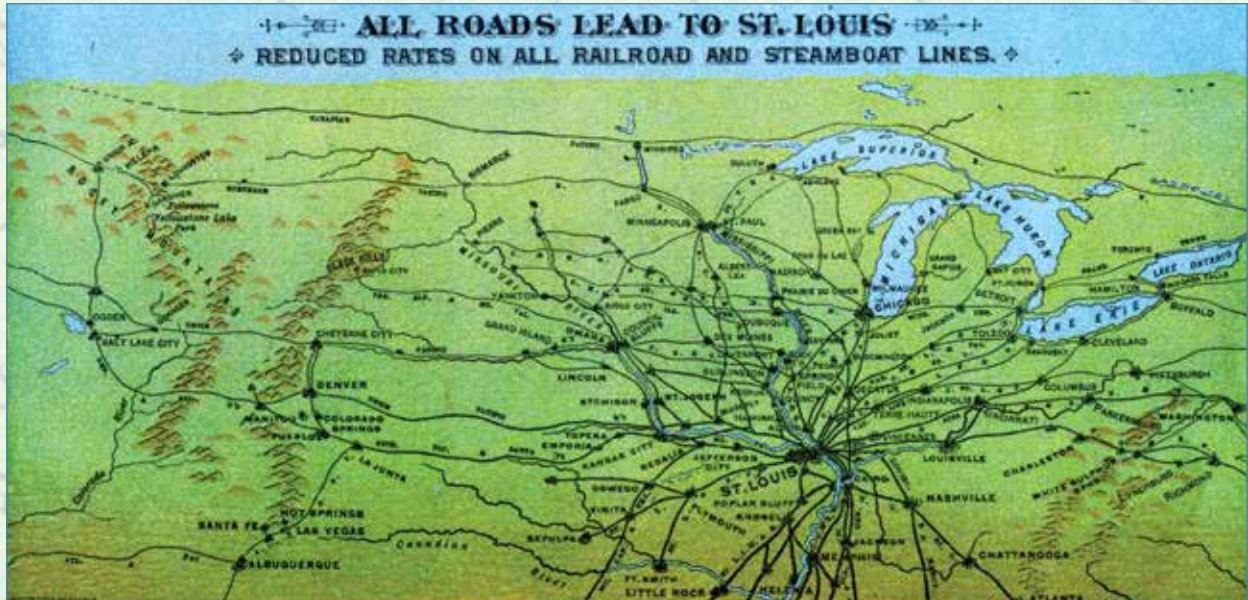


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Just as all roads were said to lead to Rome, so too did boosters in St. Louis in 1886 boast that all railroads led to St. Louis. "In addition to being the best railroad center in the United States," bragged the 1892 *St. Louis Through the Camera*, and being situated on the Mississippi River made it "immeasurably superior to those of any other large city." (Image: Washington University Library Special Collections)

C O N T E N T S

C O V E R I M A G E

When you enter the Great Hall, you will experience the same sense of awe that visitors did when they first entered the Cass Gilbert masterpiece in 1912. The towering ceilings and gleaming bronze fixtures have been carefully restored, and the marble floors glisten. It is decorated with alabaster and marble lamps and a hand-sculpted ceiling. The Great Hall is an even more spectacular reading room than ever, complete with historical tables and information desk. New to this space is a north entrance/exit that leads to added restrooms, two new elevators, and a staircase to the Atrium.



- 4 "More than a Fossil-Hunter: The Life and Pursuits of Charles W. Beehler"
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Besides being a noted paleontologist in the Gilded Age, Charles Beehler was also a noted inventor, manufacturer, and businessman—and he made Kimmswick famous for mastodon bones.



- 20 "Greedy Merchants and Idle Women: Economic Crisis and Community in the Lower Missouri Valley, 1819-1825"
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As a merchant economy emerged in Missouri River towns in the 1820s, so too did a rhetoric about the roles of women in this changing economy. Rebekah Mergenthal examines the debate about changing gender roles in an evolving market economy.



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The St. Louis Public Library opened its renovated Central Library in downtown St. Louis in fall 2012 for the centennial of the building that was one of some 1,700 libraries funded by steel magnate Andrew Carnegie. Here's what makes this Cass Gilbert design such a community asset.



- 38 "The Forest for the Trees: The Benefits of the Trees of Forest Park"
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Before the Louisiana Purchase Exposition in 1904, Forest Park in St. Louis was mostly exactly that—forest. After felling thousands of trees for the world's fair and creating a new park, parts of Forest Park are still forested. John Wagner looks at tree plantings and species to determine if Forest Park is an environmentally sustainable park for the 21st century.



- 50 "St. Louis Through the Camera"
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In 1892, St. Louis Autumnal Festivities Association published a booklet to promote the assets and amenities of St. Louis. Its photographs showed the city not as a grimy industrial metropolis, but in the most flattering light. They may say "the camera never lies," but does it?

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From the editor

It's sometimes hard to think in terms of the wonder experienced in another age. As someone who teaches history and lives most of his life in the nineteenth century, I'm especially aware of how hard it is for students—and the rest of us as well—to realize how different another time really was, and how much people marveled at things we consider run-of-the-mill.

Just think of our own lifetimes and our own recent past. I can take a photo of, say, Horseshoe Lake and email it to people right on the spot with my phone (which, as my wife reminds me, isn't a phone—it's a camera, information center, online access tool ... and a phone) or post it on social media. It takes a few seconds—a few more if you have an older "slow" one. When I got my first "smart" phone it seemed like a miracle that I could do that; now, not really. And so it goes.

In many ways, that sense of wonder of another age is an underlying theme of all these articles. R. Bruce McMillan reminds us of the wonder of discovery of the remains of extinct creatures. Now, it takes a child finding a dinosaur bone to provoke that in us, and even then it seems fleeting. We're reminded of the wonder of seeing St. Louis from a birds-eye view and the unbounded confidence in the city in Miranda Rechtenwald's selections from *St. Louis Through the Camera*, a promotional booklet published in 1892 and coupled with the brochure for the 1886 Autumnal Festival. Photography wasn't all that new in 1892, but it was becoming much more commonplace thanks to both printing technologies and George Eastman's cameras—rapidly becoming the 1890s version of my smart phone.

Rebekah Mergenthal's fascinating look at the role of gender in the Missouri Valley in the 1820s suggests not only a sense of vision that we see in *St. Louis Through the Camera*, but also reminds us of the sense of progress that marked the Jacksonian era. These were people who saw America in terms of constant growth and constant progress as it marched westward. That sense of progress continues, of course, although now we see a need to plan it more strategically. John Wagner's fascinating look at the role of tree species in planning sustainable parks, using Forest Park as a case study, suggests the wonder of the natural world and its place in shaping our future.

Finally, one cannot enter the newly renovated St. Louis Public Library's Central Library in downtown St. Louis without a sense of awe. It's a magnificent structure, built in 1912 with funds from Andrew Carnegie, the steel magnate-turned-philanthropist. Besides being the world's first billionaire, Carnegie was committed to giving away his fortune, noting in 1889 that "the man who dies thus rich, dies disgraced." And I can take a picture of it with my phone/camera/whatever-it-is and send it to you in seconds.

Jeffrey Smith, PhD
Editor





More than a Fossil-Hunter:

The Life and Pursuits of Charles W. Beehler

BY R. BRUCE MCMILLAN

In the decade preceding the 1904 Louisiana Purchase Exposition, a St. Louis native of German descent became well known for his discovery of mastodon remains and other fossils he excavated from the legendary Kimmswick “bone-bed” in Jefferson County, Missouri. C. W. Beehler spent the dawn of the twentieth century amassing a large collection of fossils that he housed in a small frame building at the site along Rock Creek, which he referred to as a museum. Beehler promoted his enterprise in St. Louis, and as the World’s Fair approached he arranged for day trips by train from St. Louis for people to view his excavations and large collection of fossils. As word of his endeavor reached learned individuals around the country, including scientists in the hallowed halls of the American Museum of Natural History in New York and the Smithsonian Institution in Washington, Beehler became well enough known that he was guaranteed a place in the region’s history.¹ But Beehler was far more than a fossil collector or amateur paleontologist. His story begins much earlier in this bustling riverfront community of the mid-nineteenth century.

Charles William Beehler (1844–1914) was born to Francis and Catherine Beehler in St. Louis on April 4, 1844, the eldest of six children, including four sisters (Mary, Catharine, Sophia, Louisa) and a brother (Francis), the latter named after his father. His family called him William, but as an adult he preferred to use his initials and thereafter went by the name of C. W. Beehler. Both of his parents were German immigrants, his father listing Baden and his mother Prussia as their homelands.² C. W. Beehler’s father was a successful business entrepreneur,

an upholsterer and mattress maker by trade, catering to the needs of steamboats and hotels from his business near the riverfront on north Second Street.³ The Beehler residence was situated three blocks away on Fifth Street.

When C. W. Beehler was seven years old a massive fire (June 19, 1851) destroyed the block of buildings on Second Street owned by his father, a loss estimated at \$45,000. The buildings housed Francis Beehler’s mattress factory and a furniture store owned by W. H. Harlow. Only a fraction of the loss—\$5,000—was covered by insurance.⁴ Ironically, soon afterward Francis Beehler became a board member of the St. Louis Mutual Life and Health Insurance Company.⁵ After the fire Francis Beehler moved his business a block south to 78 North Second Street where he reopened his mattress and upholstery company.

Prior to 1850 C. W. Beehler’s father began investing in land that he purchased from the General Land Office of the United States, government land made available through the 1820 Act of Congress that provided for the sale of public lands. The real estate he acquired was in Jefferson County south of St. Louis. He acquired three contiguous parcels in 1848–49 on Joachim Creek northwest of Festus that totaled 107.25 acres, and he later purchased 212.5 acres in partnership with an individual identified as John James. This latter acreage was located in western Jefferson County near La Barque Creek about three miles south of the Meramec River. There was a hiatus in his land acquisition of a few years while Francis Beehler recovered from his loss sustained from the fire, but by 1857 he had sufficiently recovered to purchase 240 acres adjacent to

C. W. Beehler posing with mastodon bones at the Kimmswick bone-bed. (Image: George Stark, Missouri History Museum)

52 ST. LOUIS BUSINESS DIRECTORY.

JOHN BRAUN,
MUSICIAN AND INSTRUMENT MAKER,
 No. 160 North Sixth Street,
 ONE DOOR FROM FRANKLIN AVENUE,
ST. LOUIS, MO.
 Violin repairing done with neatness and dispatch. All orders for Parties and Balls attended to.

A. BERNSTEIN,
 IMPORTER OF
HAVANA CIGARS,
 And Dealer in
MEERSCHAUM PIPES,
 No. 44 FOURTH STREET, under Planters House,
ST. LOUIS, MO.

FRANCIS BEEHLER,
UPHOLSTERER,
 No. 78 NORTH SECOND STREET,
 Between Olive and Locust, opposite the Monroe House,
ST. LOUIS, MO.
 Steamboats and Hotels furnished in the best manner, cheap for cash. Feather Beds, Hair, Moss, Shock and Spring Mattresses, constantly on hand or made to order. Carpets and Oil-Cloths cut and made, Beds and Mattresses refilled, Chairs and Sofas repaired at short notice. Families supplied cheaper than any other house in St. Louis.

GEORGE BAYHA. CHARLES BAYHA.
G. & C. BAYHA,
Packers of Pork & Beef,
 AND
PROVISION DEALERS,
 Nos. 291 & 293 South Second St.,
ST. LOUIS, MO.

Page from the *St. Louis Business Directory* advertising Francis Beehler's upholstery business on N. Second Street in St. Louis.

the parcels he already owned on Joachim Creek. As a boy, Charles would have had the opportunity to become familiar with Jefferson County, a region that became important to him later in life when he explored the fossil beds around the mineral spring at Kimmswick.

St. Louis tax records reveal that in 1861 Beehler's father's holdings were assessed at \$68,290, earning Francis Beehler an entry on a roster of firms and persons with assessments exceeding \$9,000—an exclusive list advertised as including only the names of the “solid men” of St. Louis.⁶ Thus, Beehler grew up in a financially secure home, but little else is known about his childhood. Records at St. Louis University document that he was enrolled as a student in a boarding school operated by the

university in 1851–52 when he was seven years old, one of 218 registered students.⁷ The older students had been separated from the younger students four years earlier and assigned distinct playgrounds, dining rooms, and study halls.⁸ There is no evidence that Beehler attended the boarding school for more than the one year, but a half century later (1904) the university proudly listed him as a former student whom they revealed “is the fortunate possessor of the famous antediluvian bone deposit at Kimmswick, Mo, from which the celebrated mastodon now in the British Museum was taken.”⁹

By the time Beehler had reached 18 years of age, he was working as a clerk, although his place of employment was not identified.¹⁰ With the onset of the Civil War, little is known about his activities. His father volunteered for the Missouri Militia with loyalties to the Union Army. Francis Beehler enrolled in September 1862 and was ordered to active service seven months later on April 24, 1863. He was discharged a month later from active duty when he was declared exempt for being over age. The question is did his eldest son, Charles W., follow him into service to defend the Union? Perhaps not, since the 1864 *St. Louis*

Advertisement for the U.S. Box Lock Company that appeared in the monthly trade journal *Packages*, a periodical published in Milwaukee. Beehler's company advertised regularly in *Packages* and a second trade journal, *Barrel and Box*, published in Chicago.

Beehler Box Lock. Patented April 19, 1887, and Dec. 15, 1903.

Climax Box Lock. Patented.

A. B. Inside Box Lock. Patented Oct. 27, 1903.

OVER 10,000,000 OF OUR BOX LOCKS AND HINGES
 Are Used by the Largest Bottlers in the United States.

U. S. BOX LOCK CO.
 1540-44 Blair Ave., ST. LOUIS, MO.

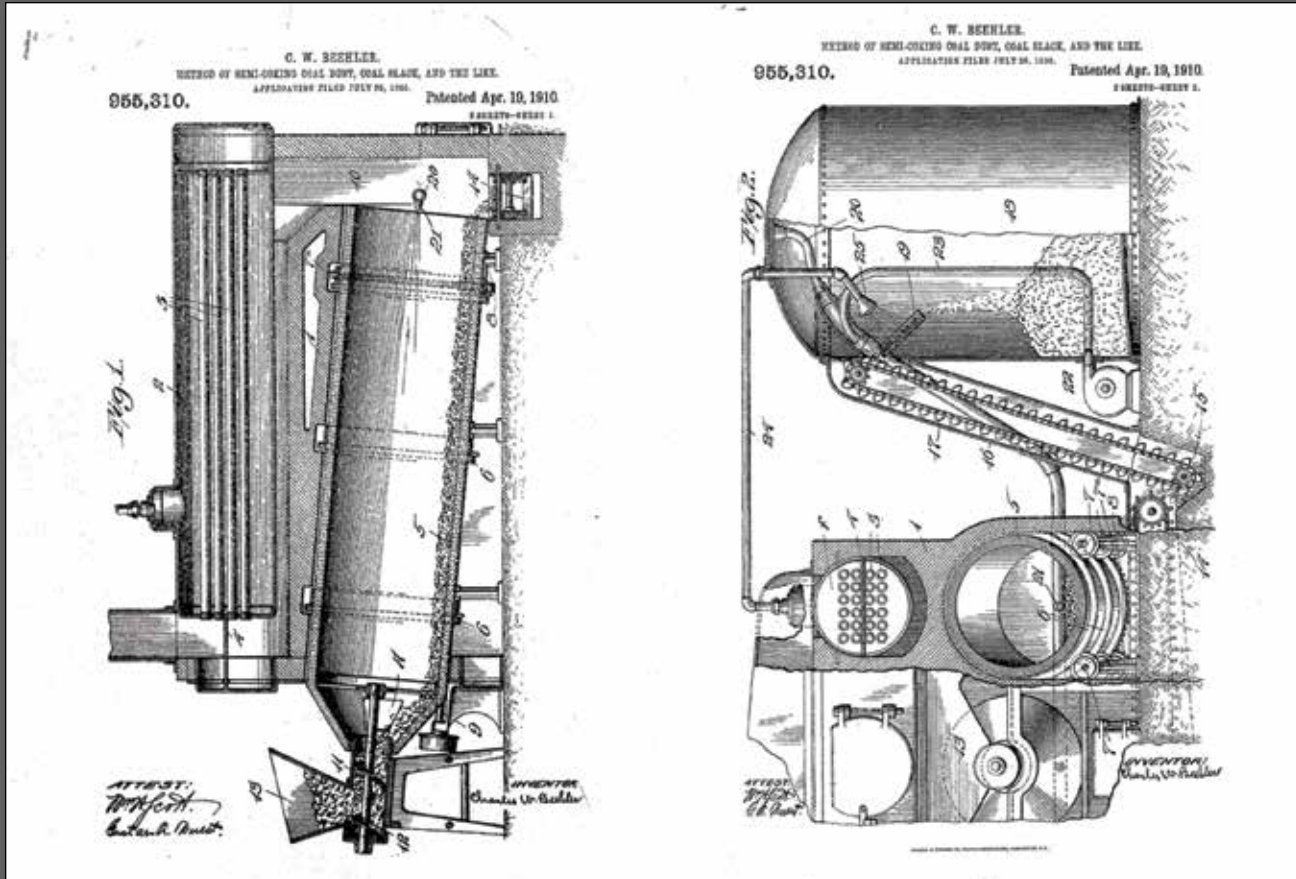
3 in. to 6 in. Light and Heavy Strap Hinge. Chest Hinge, bent for 1/2, 3/4, 1 in. Lumber.

Mention PACKAGES
 Write for Catalogue and Prices

Improved Leo Box Lock. Patented Oct. 6, 1896, and Sept. 28, 1903.

Inside or Outside Acme Lock. Pat. Mch. 11, 1890, and Nov. 24, 1893.

B. B. Box Lock. Patented April 17, 1904.



C. W. Beehler's drawings that accompanied his patent application for "method of semi-coking coal-dust." The patent for this process along with the associated machinery and hardware was issued on April 19, 1910 (Patent no. 955310).

City Directory lists William Beehler as working as a clerk in the grocery store of Vanarb & Bros. on Franklin Avenue in St. Louis.

C. W. Beehler's father, Francis, died on October 2, 1867, three years after the death of his mother, Catharine.¹¹ His father executed his last will and testament on his death bed, leaving his estate, both real and personal property, to his six children to be divided equally. Although C. W. was the eldest, he was not appointed the executor of his father's estate. Instead, Francis Beehler appointed his son-in-law, Richard Koster, the husband of C. W. Beehler's older sister Mary.¹² Of interest here is whether C. W. Beehler inherited any of the land in Jefferson County owned by his father. Examination of St. Louis Probate Court documents indicates that Francis Beehler's real estate holdings were liquidated to pay claims against the estate, a process that lasted for most of a decade. Notes and bills that were due the estate were listed as worthless or uncollectable.¹³ There is no evidence that C. W. Beehler or his siblings gained an inheritance from their father's estate.

The C. W. Beehler Family

C. W. Beehler met and later married Emma Blanche Scollay in St. Louis sometime in the late 1860s. She was born in St. Louis, a daughter of parents who had moved to the Gateway City from Massachusetts and New Hampshire. Born in 1850, she was six years younger than her husband. The couple had four children: John Charles (b. 1869), who later adopted the name Charles Francis; Mary Blanche (b. 1871); James Frank (b. 1873); and Joseph E. (b. 1878). The three elder children lived into adulthood, but Joseph died at only four years of age of a form of meningitis, or what was then described as "inflammation of the brain."¹⁴

The C. W. Beehler family moved six times over a forty-year period between 1870 and 1910. They resided at 1009 St. Charles Street, just west of North 10th Street, and then moved further north and west, where they occupied residences along Biddle Street, and later on north 20th Street. By the 1880s they again moved to be closer to the facility where C. W. was employed. These new residences were on Cass Avenue and North 14th Street, within a block of Beehler's workplace at the corner of Blair Avenue and Mullanphy Street.

If necessity is the mother of invention, C. W. Beehler exemplified this principle through a series of inventions he patented between the years 1886–1910. For the most part, his inventions were practical solutions to needs presented by his workplace. Although he had served as a clerk and bookkeeper during the 1870s, working at times as an upholsterer to follow in his father’s footsteps, by 1882 the *St. Louis City Directory* listed the industrious 38-year-old working as a machinist and drill-press operator. Records demonstrate that in 1886 he opened a metal fabricating shop at 1540-1544 Blair Avenue, advertising the business as the U.S. Box Lock Company. An ancillary business he called the Mound City Novelty Company that manufactured “novelty” hardware was located at the same address; Beehler was identified as the manager.¹⁵ The definition of novelties in this context almost certainly refers to special hardware for wooden box shipping containers, and over the next few years, Beehler spent much of his time inventing new and improved locking mechanisms for his box lock business, among other items.

At the time, wooden boxes were the standard shipping container for all kinds of commodities, and Beehler’s shop specialized in latching mechanisms and hinges for wooden boxes, especially bottle boxes.¹⁶ In fact, a 1908 advertisement claimed that Beehler’s box locks and hinges were used by the largest bottlers in the United States.¹⁷ Box hardware was a measure of the quality of a shipping container. Beehler’s designs were soon put into production and advertised in leading trade journals that featured a wide range of box locks, including those that he patented.¹⁸ The ads for the U.S. Box Lock Company that appeared in *Packages* and *The Barrel and Box* between 1905 and 1910 marketed a variety of box locks and hinges, several of which were patented by C. W. Beehler. So, were the Mound City Novelty Company and the U.S. Box Lock Company the names for Beehler’s business prior to the time the company was formally incorporated under Missouri state statutes on July 19, 1907?¹⁹ Records suggest the affirmative. Today, the Beehler Corporation with offices in St. Louis and its manufacturing plant in Mountain Grove, Missouri, traces its roots back to this hardware novelty company that began operations in St. Louis in 1886.

The 1907 documents filed with the Missouri Secretary of State reveal that C. W. Beehler, in partnership with his two sons, Charles F. and James Frank Beehler, officially established the Beehler Manufacturing Company at 1831-1833 Hogan Street. This was an expansion of the Blair Ave. business, which meant the company was now operating out of two plants in St. Louis with additional buildings used for storage.²⁰ The business was incorporated with \$50,000 capital stock divided into 500 shares.²¹ C. W. Beehler owned controlling interest with 498 shares, with each son owning a single share. The trio of father and sons served as the board of directors, with C. W. Beehler listed as chairman and president. The company was created to manufacture, buy, and sell, both wholesale and retail, locks of all kinds, hinges, springs, as well as



Promotional card issued by C. W. Beehler and the Iron Mountain & Southern Railroad. The card depicts an image of Albert Koch’s 1838 mastodon skeleton attributed to the Kimmswick site that Koch toured through the United States and later took to Europe and sold to the British Museum. As seen in the image, Koch lacked the expertise to properly assemble the skeleton, but it was later assembled by Sir Richard Owen following its acquisition by the British Museum. The image for this promotional card was taken from one Albert Koch used in a German publication entitled *Die Riesenthier der Urwelt* published in Berlin in 1845. The reverse side of the card gives details on rail transportation on the Iron Mountain Railroad to and from Union Station in St. Louis to the Kimmswick site.

other hardware specialties and novelties. In addition, it acquired, owned, and sold patent rights pertaining to such appliances.

Beehler the Inventor

It is notable that C. W. Beehler’s eldest son, Charles F. Beehler, listed on his father’s death certificate that he was an “inventor of patents.” Aside from the malapropism, the son’s reasoning was clear, for inventions were the hallmark of his father’s life. In addition to obtaining patents on thirteen new or improved designs for box fasteners between 1886 and 1905, in 1892 he had designed an improved pouring spout for oil cans that permitted one

to fill lamps (or similar receptacles) without spilling the contents. The nozzle was said to be simple, inexpensive, and a durable improvement, designed so it could be readily closed and sealed.²² A year later he sought and received a patent on a fire-grate that he designed for a second party, since it was assigned to A. Kuehne and F. Hausperger of St. Louis.²³ In 1899 Beehler patented a bin for holding coffee, cereals, or similar merchandise. His objective was to provide a means whereby the contents could be maintained within convenient reach. This was achieved by placing a flexible bag within the bin, then using a roller and straps to raise the contents.²⁴ Perhaps one of Beehler's more novel inventions was a 1901 patent, advertised as an improved sunbonnet. He claimed that his newly designed sunbonnet was lighter, yet rigid enough to hold its shape, and contained superior non-conducting properties to the bonnet's crown. It also allowed for the skirt or cape to be readily attached and detached as needed.²⁵ One can only puzzle over what might have prompted Beehler, whose inventions centered on industrial hardware, to try his hand at designing women's outdoor wear.

However, two processes Beehler patented were related to mining and gained international attention. In 1893 he received a patent on what was termed a hydrothermal mining process.²⁶ Once again, this patent was assigned to A. Kuehne of St. Louis.²⁷ This development called for filling a closed casing with a liquid, inserting it in the bore hole, and heating the encased liquid with an electric resistance coil until it expanded, thus exerting expansive force within the drill hole. The process was widely advertised. Journals such as *Scientific American* and the *Western Electrician* listed the invention, and several leading journals described the process as a new development in drilling technology.²⁸ Several years later (1903) Beehler invented a new method of semi-coking coal dust and coal slack.²⁹ He maintained that his method would produce a low cost, marketable fuel from coal dust and slack, a raw material that could be obtained inexpensively at coal mines. The method was described as reducing coal dust and slack to a semi-coke that could be used for fuel, with the heat necessary for the operation being generated from the gases arising from the coal dust and slack itself during the semi-coking process. *Chemical Abstracts* listed this new and improved process, and journals such as *Industrial World* and *Mines and Minerals* included Beehler's process under their new inventions related to mining.³⁰

The Growth of the Beehlers' Manufacturing Enterprise

When C. W. Beehler died in 1914, he was serving as president and chairman of the board of the company. Following his death his eldest son, Charles F. Beehler, was elected president, and in 1916 the stockholders voted to change the name of the company to the Beehler-U.S. Box Lock Company, officially restoring the name that had been used during the final decade of the nineteenth century until the company was incorporated in 1907. The stockholders also voted to increase the stock to \$75,000 with 750 shares

at \$100 each. A document filed with the Missouri Secretary of State a year later lists the stockholders and the number of shares of the corporation each of the stockholders owned. It is obvious that upon his death C.W. Beehler divided his stock in the company among his spouse and children. Although two additional individuals, F. W. and L. W. Goessling, had been added as stockholders, with the latter serving as secretary, the Beehler family had controlling interest in the company. C. W. Beehler's wife, Emma, owned 122½ shares, as did Charles F. Beehler, the company's president, and Beehler's daughter, Mary Blanche Schreiner. His younger son, James Frank, who served as secretary at various times in the company's history, owned 127½ shares. Each share was worth \$100.

Charles F. Beehler relinquished the president's position in the early 1920s, but J. Frank Beehler served as secretary as late as 1931. J. Frank and Mary Blanche Schreiner were still listed as stockholders in the late 1920s. By the mid-1930s the only legacy of C. W. Beehler left with the company was his name. In 1920 the U. S. Box Lock Company's name was changed to the Beehler Steel Products Company, then almost eight decades later, in 1999, just prior to its move to Mountain Grove, Missouri, the company was renamed the Beehler Corporation, a title it holds today.

The Kimmswick "Bone Bed"

Prior to the turn of the twentieth century, C. W. Beehler became actively involved in exploring a late-Pleistocene paleontological deposit that is often referred to as the Kimmswick "Bone Bed." This feature is now part of the State of Missouri's Mastodon State Historic Site, located at the junction of Rock and Black Creeks a few miles south of the Meramec River in Jefferson County. Early settlers referred to a spring-fed artesian fen associated with the bone deposit as Sulphur Spring, not to be confused with a second spring and adjacent hamlet by the same name located a few miles south along the Mississippi River.³¹ "Saline," as a designation for the spring, would have been more appropriate given that the salt-laden water of the spring is typical for saline springs found throughout the central Mississippi and lower Ohio River valleys. In fact, prehistoric Mississippian Indians had located a large village nearby—the Herrell Village (J'55)—and were evaporating salt from the spring several centuries prior to European settlement of the area.³²

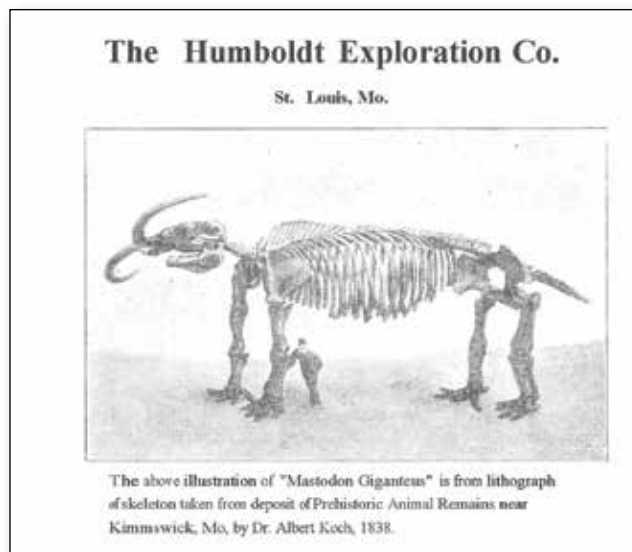
The "bone bed" was first recorded by the pioneer botanist John Bradbury in 1809, when he wrote "at a salt lick about three miles from the Mirramac (sic) River, and twelve from St. Louis, several bones have been discovered, evidently belonging to the same species of mammoth (e.g., mastodon) as those found on the Ohio, and in Orange county, state of New York."³³ Local oral history about the bone deposit was amplified in the 1840s when Albert Koch, a museum proprietor in St. Louis, excavated mastodon remains at the site and sold a composite skeleton he had assembled from bones he procured at Kimmswick, and from a comparable spring deposit along the Pomme de Terre River in western Missouri.³⁴ The fact that Koch

subsequently sold the skeleton to the British Museum for a sizable sum (£ 1,300) undoubtedly became legendary in Jefferson County. As a lad, C. W. Beehler must have been exposed to this local folklore, for it was less than a decade after Koch sold his skeleton that Beehler's father was acquiring land in Jefferson County. Beehler as a boy could very likely have accompanied his father on trips to this region. Evidence of his familiarity with Koch's earlier work is supported by Beehler's use of an image of Koch's mastodon skeleton when advertising his venture during the years leading up to the Louisiana Purchase Exposition in St. Louis.

Beehler, described as a small man but quick and alert and a genuine worker, initially came to the Kimmswick Site in 1893 when he was prospecting for silica.³⁵ He befriended the local farmer and landowner, Fritz Miller, who lived across the stagecoach road, and while sharing a meal at the Miller residence he observed bones that Miller had collected from the site. Period newspaper accounts state that Miller subsequently leased the site containing the bone bed to Beehler.³⁶

Beehler began serious work at Kimmswick in 1897, two years before plans were formalized to hold a world's fair in St. Louis to commemorate the centennial of the Louisiana Purchase. Records suggest that Beehler began work sometime in the fall since he was still in St. Louis during May where he filed a complaint in U.S. Circuit Court against Frank X. Hausperger for alleged infringement of one of his patents.³⁷ Beehler may have been working at the site by August when Benjamin E. Blow, a St. Louis attorney, arrived in Jefferson County and made a sizable collection of artifacts from the Herrell Village site. A friend who accompanied Blow collected mastodon bones from the nearby Kimmswick site.³⁸ Beehler and W. B. Swan, a St. Louis businessman who later partnered with Beehler in forming the Jefferson Mining Company,³⁹ were digging at Kimmswick in late November and conferring with William Bleeker Potter, Allen Professor of Mining and Metallurgy at Washington University in St. Louis, on identifications of fossils they were unearthing.⁴⁰ Potter was a member of the Archaeological Section of the St. Louis Academy of Science and noted for his expertise in Mississippi Valley archaeology after penning his volume *Archaeological Remains in Southeastern Missouri*, published in 1880.⁴¹

It is uncertain whether or not Potter was the stimulus, but the following year patrons of Washington University became interested in the site. Pursuant to this a number of wealthy St. Louisans began making arrangements to work with Beehler to uncover the bones in a more scientific manner, and to present the collection to Washington University.⁴² These individuals formed a corporation they named the Humboldt Exploration Company, which was incorporated as a prospecting company on April 4, 1898. The company was founded with \$5,000 capital and divided into 100 shares.⁴³ Distinguished St. Louis citizens affiliated with this company were Bernard Griesedieck, President; J. W. Caldwell, Secretary; Joseph Griesedieck; J. H. A. Meyer; W. B. Allison; Dr. A. C. Peterson; Gustave Nieman; D. I. Bushnell; Charles Rippe; C. W. Martin; J.



Cover of a brochure printed by the Humboldt Exploration Company in St. Louis soliciting subscriptions to help with the exploration of the deposit at Kimmswick. Subscribers were also entitled to select for their own use specimens amounting to the amount of their subscription. Subscriptions were listed at ten dollars per share. The same image of Koch's mastodon was used on this brochure that was depicted on Beehler's promotional card for attracting visitors on the Iron Mountain and Southern Railroad.

B. Groeninger; Frank Beebe; A. A. Kleinschmidt; H. C. Griesedieck; Dr. H. M. Kinner, Jr.; and E. P. Ohlshausen. A brochure advertising the company stated that the afore named individuals "desire a few gentlemen to assist in its [Kimmswick] further development, and for this purpose have placed on sale subscriptions at ten dollars per share to be paid upon delivery of stock. Subscribers are entitled to select for their own use, specimens amounting to the amount of their subscriptions."⁴⁴

A month later Dr. Jacob L. Wortman, Curator of Vertebrate Paleontology at the American Museum of Natural History in New York, visited the site and identified the bones of several species of extinct fauna in addition to the ubiquitous mastodon remains. Specimens of horse, ground sloth, American ox (muskox), and what he simply described as "other rare animals," were listed.⁴⁵ The involvement of patrons of Washington University in Beehler's Kimmswick project, especially William B. Potter, along with Jacob Wortman's analysis of the site, may have alerted representatives of the Smithsonian Institution to the potential of this paleontological mecca. At the time, curators at the National Museum of Natural History at the Smithsonian were trying to obtain a skeleton of a mastodon or mammoth for the Pan-American Exposition in Buffalo, New York. In August 1900, Frederic A. Lucas, Curator of Comparative Anatomy at the U.S. National Museum, visited Kimmswick and observed that it was the largest deposit of mastodon bones yet discovered. He went on to say that "for some reason, which I have not



W. H. Holmes and DeLancey Gill from the Smithsonian Institution are shown unearthing bones at the Kimmswick Site. Left to right: Water Miller, son of the land owner; DeLancey Gill; W. H. Holmes; C. W. Beehler; and H. C. Townsend, ticket agent for the St. Louis Iron Mountain and Southern Railroad. Photograph by George Stark, September 1901. (Image: Missouri History Museum)

had time to investigate, the local conditions were favorable to the formation of deposits there, and I have never seen anything to equal them.”⁴⁶ Lucas was accompanied by his assistant, Alban Stewart. The two collected some fossils from Kimmswick, and they were accessioned into Smithsonian’s collections (37551–Nov. 19, 1900) under Stewart’s name.⁴⁷

The publicity on Kimmswick attracted two additional scientifically prominent individuals. Dr. W. C. Mills, from Ohio State University, visited the site and collected several specimens. Professor Mills retained for his university collection several small lower tusks of the mastodon as well as two teeth of a giant ground sloth (*Megalonyx jeffersonii*).⁴⁸ Later, the renowned vertebrate paleontologist Oliver P. Hay, an associate of the Carnegie Institution in Washington, visited Beehler when on a trip to St. Louis. Hay listed the following animals in Beehler’s collection: mastodon, mammoth, horse, deer, stag-moose, shrub-ox, muskox, and extinct and modern bison.⁴⁹ Russell Graham, a vertebrate paleontologist who conducted excavations at the site in the 1980s for

the Illinois State Museum, cautions that the faunal list attributed by Hay to Kimmswick may contain specimens from other localities. Graham questions the inclusion of mammoth, a proboscidean that was not recovered by later investigators.⁵⁰

By 1900 Beehler was compelled to construct a small frame storage building that he opened to the public as an onsite museum. Completion of the building satisfied the need for storage as well as providing a display space to satisfy the curiosity of the increasing number of visitors. Specimens were arranged along the sides and center of the building that measured 40 x 18 feet with numerous windows on all sides.⁵¹ An artist’s sketch of the site rendered in 1901 shows the location of the museum, the excavation with a tent covering a portion of the dig, and a second tent pitched on the east edge of the site.

Beehler was now prepared to promote his attraction during the dawning of the 1904 St. Louis World’s Fair.

Prominent visitors arrived from St. Louis and other parts of the United States, attracted to Kimmswick by the increasing publicity that Beehler generated in the local

press that was subsequently picked up by newspapers throughout the country. Some individuals were interested in obtaining specimens, which was possible through a subscription to the Humboldt Exploration Company. Edward H. Angle, a famous pioneer orthodontist, visited the site and asked in a subsequent letter how he could procure a mastodon molar as well as an elephant's tooth.⁵² This was probably a common occurrence, but it is impossible to determine just how many people requested and secured specimens from Beehler's collection. There is a record that Beehler denied an overture from Dr. Oliver C. Farrington, Curator of Geology at the Field Columbian Museum, to transfer to him exclusive rights to explore the site.⁵³ The offer was rumored in the Kimmswick community to be \$10,000, but newspaper accounts place it closer to \$3,000. Regardless of the amount, Beehler was in no mood to relinquish his ownership of the site, which was bringing him fame if not a fortune.

During late 1900 a St. Louis newspaper, *The Republic*, sensationalized Beehler's finds by claiming that the intrepid St. Louisan had discovered, along with prehistoric animals, three large human skulls that could ostensibly represent the "missing link." The story was immediately carried from coast to coast, appearing in newspapers as widely separated as the *Washington Times* and the *San Jose Evening News*.⁵⁴ As with most hyperbole, the story quickly evaporated once it was found to lack substance. Such tales

may have sparked Beehler's imagination because soon thereafter reports had him digging for buried treasure a few miles south of Kimmswick near the small railroad hamlet of Sulphur Springs, where local legend alleged that Spanish gold was buried around the springs from which the town derived its name.⁵⁵

By 1901 planning for the Louisiana Purchase Exposition in St. Louis was well underway. Dr. Frederick True, Curator of Zoology at the U. S. National Museum and Smithsonian's representative for planning for the 1904 World's Fair, became interested in Beehler's discoveries and believed they would prove an attractive exhibit for the exposition. During July Pierre Chouteau and F. W. Lehman, Chairmen of the World's Fair Committee on history, ethnology, and anthropology, and W. B. Stevens, secretary of the Louisiana Purchase Exposition, visited Beehler to ascertain if a suitable exhibit for the World's Fair could be made from the Kimmswick remains.⁵⁶ Beehler believed that he possessed enough bones to build a complete skeleton of a mastodon.⁵⁷ Apparently the World's Fair emissaries were not convinced, as there is no evidence that a full mount of a mastodon skeleton from Kimmswick was exhibited at the 1904 exposition. There was a report in some national newspapers that "a wagon load of mastodon bones" was being articulated into skeletons for exhibition in Washington.⁵⁸ At best, this was simply rumor.

W. H. Holmes and C. W. Beehler examining a stratigraphic profile of an excavation next to a bluff at Kimmswick Site. (Image: George Stark, September 1901, Missouri History Museum)



The Question of Human-Extinct Faunal Associations

Scientific interest in Kimmswick continued when word reached W. H. Holmes, Head Curator of Anthropology at the Smithsonian Institution, that Beehler had found a human bone associated with the mastodon remains. Holmes, accompanied by Smithsonian photographer DeLancey Gill, was on his way to Afton, Indian Territory (Oklahoma), to examine the context of human artifacts unearthed along with mastodon remains at a sulphur spring near Afton. The antiquity of humans in the New World was a fundamental topic of debate within the scientific community at the turn of the twentieth century. The issue was whether “Paleolithic Man” was present in North America, as was the case in Europe. If one could demonstrate an association with extinct megafauna, a much earlier antiquity of humans would be established. Holmes was central to this debate, believing that archaeological remains were related to modern tribes and of no great antiquity.⁵⁹ He therefore placed the burden of proof on the proponents for greater antiquity to demonstrate the existence of early humans on this continent.⁶⁰

The possibility that Beehler had found a human bone associated with the remains of extinct animals at Kimmswick convinced Holmes to stop in St. Louis for a few days in late September 1901 to visit with Beehler and T. D. Townsend, who is listed in the St. Louis City Directories (1905–1907) as a St. Louis book dealer.⁶¹ Holmes said that he spent a very instructive day at the site, alleging that “the question of the association of human remains with those of the mammoth and mastodon raised at this place is not at all conclusive.” He further stated “that the bones found, which so closely resemble the humerus of man, may be portions of the fibulae of young mastodons, and that the flint implements reported as occurring with the fossil remains may have been recently introduced.”⁶² Holmes indicated, however, that he would suspend judgment until more critical and exhaustive studies could be carried out and resolved to return to Kimmswick at an early date.

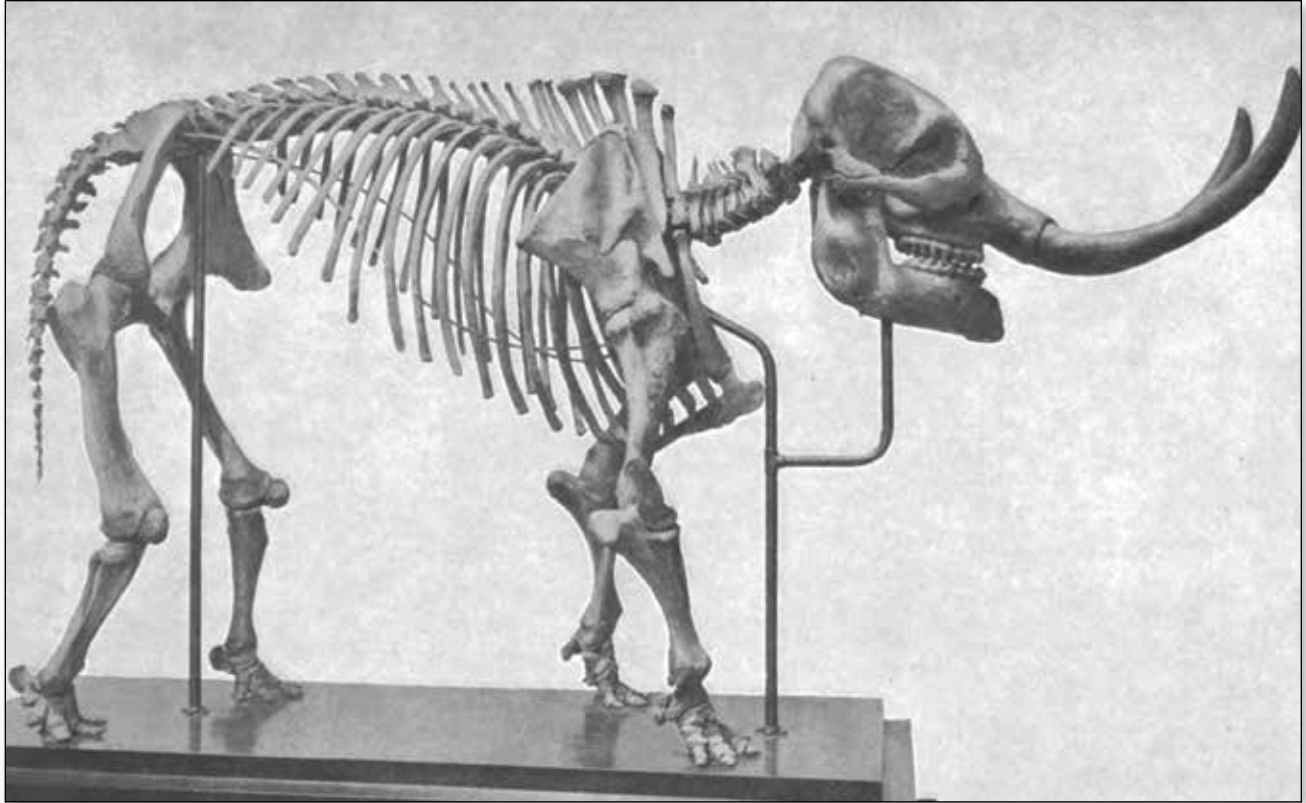
W. H. Holmes kept his promise and returned to Kimmswick a year later accompanied by Gerard Fowke, a Smithsonian archaeologist, to investigate more thoroughly the potential for human association with the extinct fauna at Kimmswick. The pair arrived in September and began work on a trench that began 60 feet from the bluff and reached a depth of 12 feet. Presumably this was with Beehler’s blessing, because this was the period when Beehler was promoting his site as a tourist mecca. It was probably not lost on Beehler that having famous Smithsonian scientists digging at the site would have been an attraction in itself. Fowke reported that they found abundant mastodon bones but the remains were broken and scattered.⁶³ He further noted that anatomists had definitely determined that the fibula was not human. Holmes summed up the work by reporting that no traces of man were found in direct association with the fossil

remains.⁶⁴ Fowke was even more emphatic, stressing that “nothing has been found at the site, or anywhere else in the region, which tends to show that man existed here as a contemporary of the mastodon.”⁶⁵ Some fossil bones and artifacts from a nearby mound were retained for the Smithsonian’s collections.⁶⁶

The irony of Holmes’ interpretation is that Beehler may have unearthed evidence that humans were contemporaneous with the mastodon, but several factors precluded Holmes from recognizing an association. Although Beehler’s Washington University associates had advocated that he improve his scientific techniques, his excavation procedures were not refined enough to collect critical contextual information, and the discovery of fluted projectile points with extinct fauna at Folsom, New Mexico,⁶⁷ the first site to demonstrate an indisputable association between Early Man and extinct fauna, was still a few years in the future.

Excavations at Kimmswick in the 1980s by the Illinois State Museum established that Clovis hunters had either killed or butchered mastodon (*Mammot americanum*), peccary (*Mylohyus nasutus*), and deer (*Odocoileus* sp.) at the site.⁶⁸ Beehler had found artifacts among the bones, but Holmes believed the flint implements may have been recently introduced since identical forms were plentiful on the surface.⁶⁹ That may have been the case because the Illinois State Museum confirmed that the Holocene colluvium that overlies the mastodon deposits contains chipped stone artifacts of Early and Middle Archaic age, cultural material that is more recent than the extinct faunal assemblage.⁷⁰ But there was an artifact from Kimmswick that Holmes remembered seeing that was different. It was a projectile point “that had a concave base and a long flake struck from the base on either side passing longitudinally beyond the middle of the point.”⁷¹ Holmes related to Matthew W. Stirling, who was Chief of the Bureau of American Ethnology, in the winter of 1927–1928 that he was shown this point when he visited the Missouri Historical Society in St. Louis, most likely in 1902. He said the point had come from Albert Koch’s excavations. This may have been a mistaken attribution because even during Beehler’s time Kimmswick was often associated with Koch. Beehler, himself, advertised the site as the “deposit of prehistoric animal remains from which ‘Mastodon Giganteus’ was taken by Dr. Albert Koch in 1838.” Ashley Montagu points out that at the time of Stirling’s conversation with Holmes, the latter was not aware of the recent finds at Folsom, New Mexico, where fluted projectile points were found in direct association with extinct bison. In a word, Holmes had not had an opportunity to observe the Kimmswick fluted point *in situ* and, for that matter, would have been unaware of its probable antiquity. After all, one of Holmes’ criteria for acceptance of Early Man in America was that an implement of Early Man be discovered, verified, and found to bear indisputable evidence of context and use.⁷²

The question then became was the fluted point from Kimmswick that Holmes observed at the Missouri Historical Society from C. W. Beehler’s work, instead of



Mastodon skeleton mounted by Alban Stewart under the direction of Frederic Lucas of the Smithsonian Institution and exhibited at the 1904 Louisiana Purchase Exposition in St. Louis. The bones for most of the skeleton were from a peat bog near Church, Michigan; however, the bones used for the left hind limb came from the bone bed at Kimmswick. Image from Plate XXXV, Notes on some recent additions to the exhibition of vertebrate fossils by Charles W. Gilmore. (Image: *Proceedings of the United States National Museum, Vol. 30*)

the earlier work there by Albert Koch? There is evidence to the affirmative. A St. Louis dentist, Dr. W. F. Parks, a member of the St. Louis chapter of the Archaeological Institute of America and a member of the advisory committee to the Missouri Historical Society, was asked to visit Beehler's excavation to view a fluted point left *in situ*, and situated among the bones of mastodon, horse (*Equus complicatus*), and ground sloth (*Megalonyx jeffersonii*).⁷³ Parks was able to secure this point and take it to St. Louis. Eight years later he passed the specimen on to Byron Knoblock, a commercial artist and artifact collector in Quincy, Illinois, who subsequently donated it to the Field Museum in Chicago along with a diagram drawing of the location and an affidavit signed by Parks detailing the circumstances of the find. The artifact, identified as a Clovis projectile point, is catalog number 205526 in the Field Museum's Anthropology collection. Although circumstantial, it is likely that this is the concave-base, fluted specimen shown to Holmes during his visit to the Missouri Historical Society and was the one that came from C. W. Beehler's Kimmswick excavation. As mentioned earlier, it is ironic that this went unrecognized during the early 1900s and had to wait until the 1980s for recognition that early human hunters were associated with

the large extinct mammals represented in the Kimmswick deposits.

Kimmswick and the World's Fair

Records from the Louisiana Purchase Exposition suggest that although officials from the fair had expressed considerable interest in Beehler's Kimmswick discoveries, and had explored the possibility of an exhibit at the St. Louis World's Fair, a Kimmswick exhibit never materialized. The U.S. National Museum representatives did mount a skeleton of a mastodon at the fair, but the specimen came from a peat bog near Church, Michigan. The skeleton, mounted by Alban Stewart under the direction of Frederic Lucas, was essentially complete with the few missing parts restored in plaster. An exception, however, was the left hind limb, which came from a similar sized individual from the Kimmswick bone bed. So, in a small sense, Beehler's excavation was represented at the St. Louis World's Fair. Following the fair, this mastodon skeleton was taken to Washington and placed on exhibit in the U.S. National Museum.⁷⁴

Few images survive from Beehler's work at Kimmswick. A small number of photographs taken by George Stark, Sr., a St. Louis photographer who traveled



Interior view of C. W. Beehler's museum. Photograph by George Stark, September 1901. (Image: Missouri History Museum)

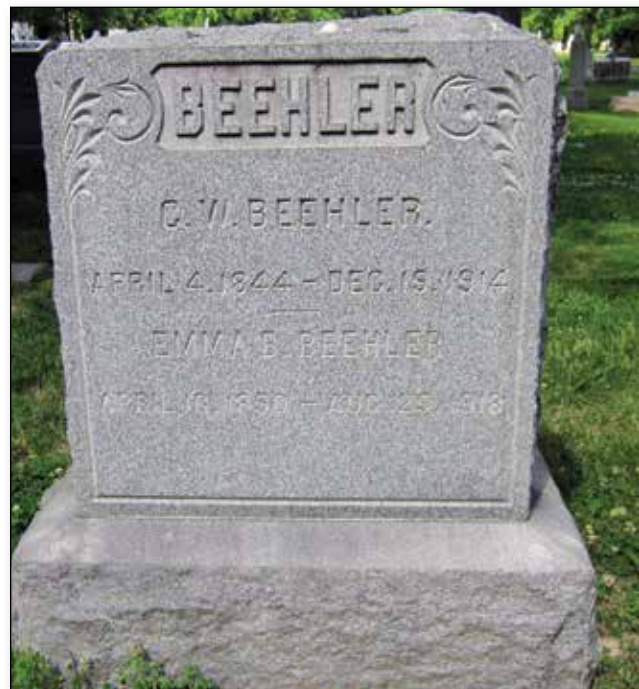
to Kimmswick to take publicity photographs for the St. Louis exposition, are archived at the Missouri History Museum in St. Louis.⁷⁵ Stark, who operated a studio at 3251 Missouri Avenue in St. Louis, is best known for his photographs of scenes taken at the World's Fair. The Kimmswick images were taken during the fall of 1901, during W. H. Holmes' first visit to the site. These photographs are the only images of C. W. Beehler known to exist (Fig. 7).

Kimmswick became an attraction for visitors both before and during the St. Louis World's Fair. Although C. W. Beehler did not rival Albert Koch as a showman, he was effective in publicizing his Kimmswick enterprise and attracting numerous people. Travel from St. Louis to Kimmswick was convenient by rail, providing an opportunity for Beehler to work with the Iron Mountain and Southern Railroad to attract visitors to the site. Excursions were advertised as running daily, except Monday, with trains leaving Union Station in St. Louis at 8 a.m. and returning at 3:25 and 6:15 p.m. Round trip tickets cost 50 cents. An advertisement issued by Beehler prior to the fair promoted the site as a must see attraction:

[You]...and [your] friends are invited to visit the great bone deposit near Kimmswick, MO, 20 miles south of St. Louis, on Iron Mountain & Southern R.R. This is the largest and most interesting bone deposit of prehistoric animal remains in the world and the oldest in America. There is a museum on the grounds containing some of the finest and largest specimens ever discovered. Excavation [is] now in progress. The remains are to be used as the basis of a great natural history museum in St. Louis.

One of the attractions for visitors was Beehler's small museum packed with the bones of numerous animals. A 1901 account described the contents as those of "the mighty mastodon, the monstrous mammoth, the great American ground sloth, and the prehistoric horse."⁷⁶ In all, 3,000 bones were said to be arranged along the sides and down the center of the building. Posters and newspaper

C. W. and Emma Beehler gravestone in Calvary Cemetery (Section 21, Lot 1433), St. Louis. (Image: Connie Nisinger, May 2012)



articles adorned the walls. Visitors could marvel at the size of the specimens and the magnitude of the collection. Thus, the combination of viewing fossils being unearthed in the excavation and visiting the museum gave people a memorable and unforgettable experience.

The Post-World's Fair Years

During the years that C. W. Beehler spent at the Kimmswick Site he apparently retained his residence in St. Louis and presumably his family remained in the city. He listed his contact information on one of his promotional leaflets as both 1513 North 14th Street, St. Louis, and Kimmswick, Missouri. That would suggest that he was commuting periodically between his St. Louis residence and Kimmswick. After all, during the years he was involved with Kimmswick he applied for and received nine patents, indicating that he was still involved with his metal fabrication business. How long Beehler remained in Jefferson County following the 1904 World's Fair is unknown, but he was still there a year later when he had a well drilled on a property near the site.⁷⁷ But there is little doubt that he began to phase out his work at Kimmswick as public interest subsided after the World's Fair. Beehler may have left Jefferson County in 1905 since one Jefferson County history mistakenly reports his death that year.⁷⁸ Instead, he may have moved back to St. Louis and resumed his interest in manufacturing. That is the same year the property containing the bone bed was acquired by the Glencoe Lime and Cement Company and a large lime kiln was erected on the site. Thus, a chapter ended in the life of C. W. Beehler.

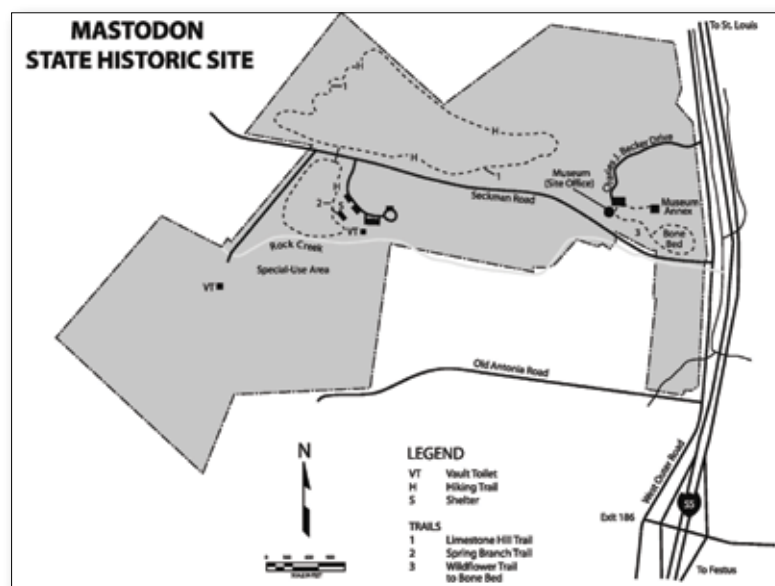
The paramount question is what happened to Beehler's collection that was housed in his onsite museum, the

collection of fossils that was to be used for "a great natural history museum in St. Louis"? In essence, this was the *raison d'être* for the formation of the Humboldt Exploration Company. But the founding of a great natural history museum in St. Louis never happened, and Beehler's collection was apparently dispersed.⁷⁹

Beehler most likely returned to St. Louis in late 1905, but he was unquestionably living there by 1907 when he and his sons formally incorporated their business, the Beehler Manufacturing Company, with the State of Missouri. His sojourn to Jefferson County during the World's Fair years seems to have reinvigorated his business appetite. He would serve as president and chairman of the board until December 19, 1914, when he died of esophageal carcinoma.⁸⁰ He is buried with his wife, Emma, in Calvary Cemetery in north St. Louis, the Catholic cemetery under the auspices of the Archdiocese of St. Louis.

Charles William Beehler was an inventor, a manufacturing entrepreneur, and an amateur paleontologist. One might also add the term "promoter," since his occupation was listed as just that in the St. Louis City Directories for the year preceding and the year of the St. Louis World's Fair.⁸¹ There is no doubt that his place in history was bolstered by his work at Kimmswick, an enterprise that attracted the attention of the national press and, more importantly, the nation's scientific community. Without the work of C. W. Beehler and his predecessor, Albert Koch, the nationally acclaimed Mastodon State Historic Site listed on the National Register of Historic Places, acquired in 1976 to interpret this scientific marvel, could very well lie buried beneath the urban sprawl of the expanding metropolitan St. Louis area.

(Fig. 13) Mastodon State Historic Site is in Jefferson County, south of St. Louis. The site is located just west of I-55 and north of the Imperial exit (186). The entrance is off the west outer road and is clearly marked. The bone bed is east and down the bluff from the modern museum. This image depicts the layout of the site. (Image: Mastodon State Historic Site, Missouri Department of Natural Resources)



ENDNOTES

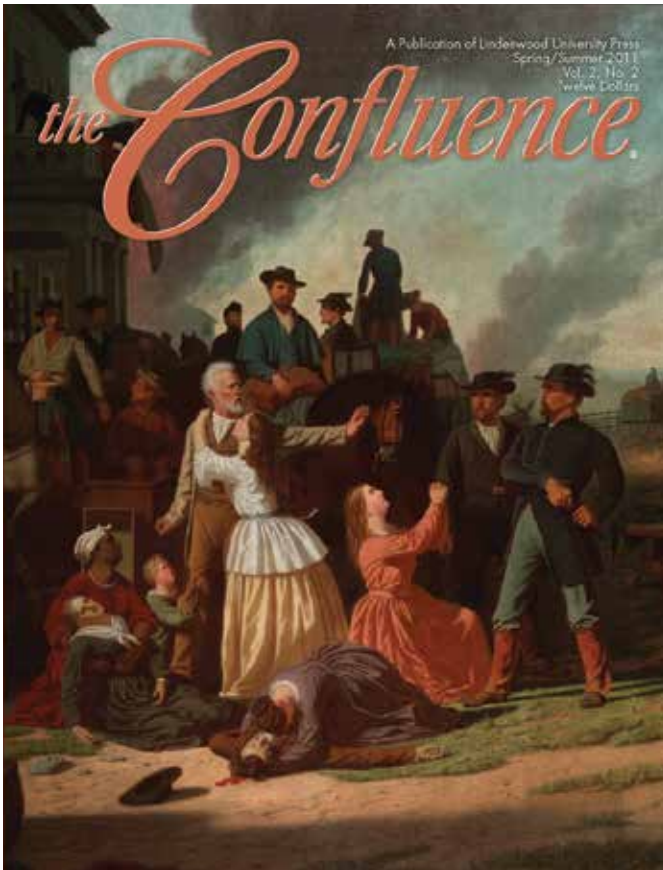
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- ¹³ *Ibid.*
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- ⁴³ *Official Manual for the State of Missouri 1899–1900* (1899), 358.
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- ⁶¹ Townsend should not to be confused with H. C. Townsend, General Passenger & Ticket Agent for the St. Louis, Iron Mountain, and Southern Railway, with whom Beehler worked to promote day trips by train from St. Louis to Kimmswick.
- ⁶² William H. Holmes, "Flint Implements and Fossil Remains from a Sulphur Spring at Afton, Indian Territory," *Annual Report of the Board of Regents of the Smithsonian Institution for year ending June 30, 1901* (1903), 237–38.
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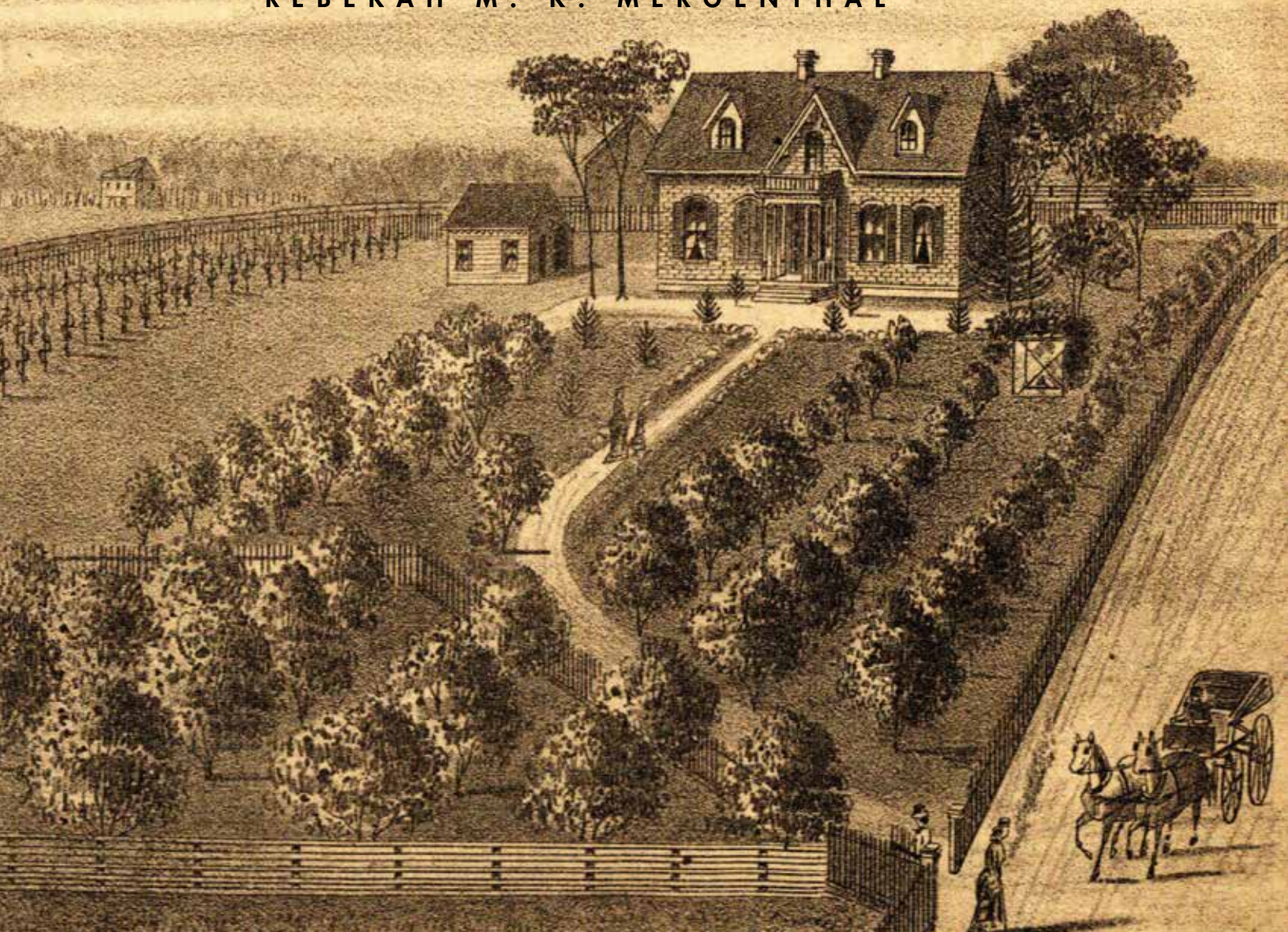
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Greedy Merchants and Idle Women

Economic Crisis and Community
in the Lower Missouri Valley,
1819-1825

REBEKAH M. K. MERGENTHAL



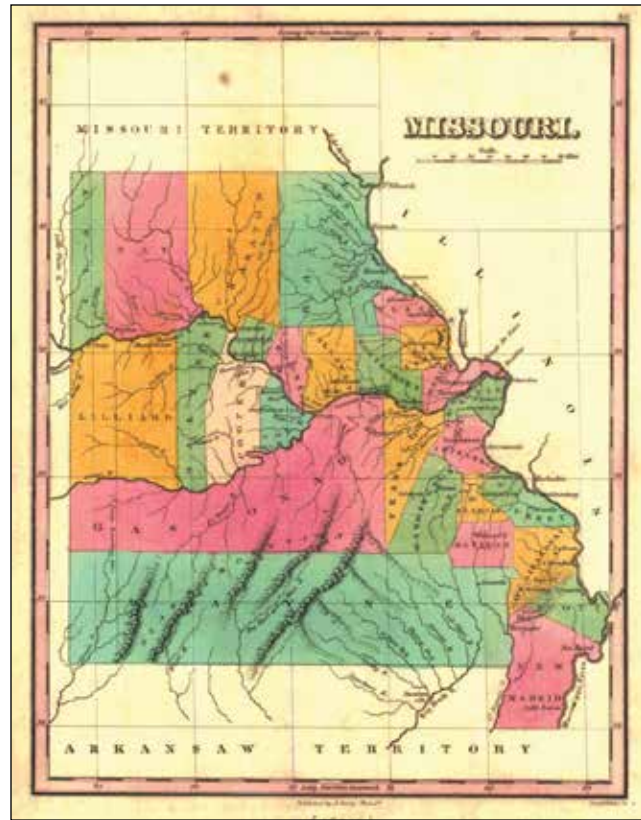
Robert M'Cloud had high hopes for the newspaper he started in St. Charles during June of 1820. He wanted his newspaper, named the *Missourian*, "to harmonize and conciliate local animosities into a bond of fraternal concord, and to melt down all distinctions into the enviable one of a 'Missourian.'" M'Cloud knew that the territory contained a wide variety of people, but he believed that their different opinions could be smoothed over for the good of the whole. Statehood was, in M'Cloud's view, a key component in the unification process.¹

When M'Cloud wrote, it began to seem to the territory's residents that they would finally be accorded equal status in the union. The contentious battle over Missouri's statehood had culminated three months previous in the Missouri Compromise and, even as M'Cloud issued his newspaper in St. Charles, members of Missouri's constitutional convention had gathered in nearby St. Louis to draw up the state's constitution. Although many Missourians still smarted from what they saw as Congress' unwarranted delay in allowing them to achieve statehood, they now looked forward to more harmonious national interactions.² As M'Cloud expressed it, Missouri would be able to move from "territorial imbecility, to the light and life of a free and independent state." With Missouri's new sense of belonging in the national community, M'Cloud and others hoped that sectional and ideological divisiveness would be a thing of the past.³

As Missouri approached political inclusion in the United States, its residents addressed another kind of community interaction, this time economic. They considered how to define the responsibility of individuals and groups to the wider economic community. They debated the kinds of exchange relations most beneficial for the community, and they discovered that Missourians had important differences over the best combination of the interests of the individual and the interests of the whole.

In order to explore these differences and their meanings, this article focuses on public discussions about the roles of members of Missouri's economic community that took place in newspapers like M'Cloud's *Missourian* during the early 1820s. In editorials and letters to the editor, Missourians negotiated the meaning of economic interactions and voiced their disapproval of others' choices. Merchants were declared to be greedy and women were called lazy as Missourians explored the problem of community in the Missouri River valley. Political integration was not as harmonious as M'Cloud had hoped, and economic exchanges also proved to be fraught. Yet, Missourians had to attempt to resolve the tensions as they tried to make a whole out of diverse parts.

Of course there had always been some variety of economic interests within the white settler community in the Missouri valley, but the conflict between its members had been somewhat muted or ignored during the fight for



As this map from 1824 indicates, most of the settlement—and business activity—surrounded the Mississippi and Missouri rivers. The combination of increased steamboat commerce and the opening of the Santa Fe Trail made the Missouri River even more of an economic thoroughfare. (Image: Missouri Valley Special Collections, Kansas City Public Library, Kansas City, Missouri)

statehood. As the effects of the Panic of 1819 began to reach Missouri in late 1820, however, the settlers' debates about the moral implications of economic exchange began to take on heightened meaning as the economic progress of their community was threatened.⁴ One of the biggest problems on the frontier was lack of specie, and in 1821 Missouri's General Assembly tried to address this by having the state's Loan Office issue certificates, popularly called Loan Office money, which could be used as a temporary replacement.⁵ Yet political remedies were not sufficient. As hard times began to spread throughout the region, its residents wrote numerous letters to the newspapers complaining about their difficulties and identifying the causes.

When looking for a culprit, most complaints focused on local merchants. Three of the merchants' economic activities were deemed particularly egregious. Merchants

Thanks to new and expanded commerce in towns like Franklin on the Missouri River (Franklin moved from its Missouri River location in the 1820s to higher ground, present-day New Franklin, after a flood), merchants could offer a wide range of goods. Steamboats reduced shipping costs, so "cheap goods" were available. (Image: Mary Ambler Archives, Lindenwood University)

were said to have “drained” specie from the local community when they took it to the East to pay for merchandise.⁶ Second, many merchants refused to accept the Loan Office money as viable currency, making other community members furious. Moreover, many of those same merchants were also unwilling to accept an exchange of local produce for merchandise, thus compounding the effects of the cash shortage for the farmers. Letters and editorials complaining about these issues carefully detailed how the merchants’ choices harmed the progress of the wider community.

In 1822, “A Farmer” from St. Charles County expressed his dismay that Missouri, which had just weathered the “thundering confusion” of its political admission to the Union, had a new, economic challenge to face. While the farmer believed the statehood crisis had been brought

about by “the repeated assaults of external enemies,” this economic crisis clearly had internal agents to blame. He saw merchants as a fundamental cause of the lack of money in Missouri: “Our specie funds have been transported by our worst enemies, the merchants, and consigned to the God of Mammon, in the eastern cities.”⁷ Even though Missouri had achieved parity as a state, residents, like this farmer, decried its continued economic dependence, as well as their own, and the local merchants’ role in perpetuating it.

The editor of the *Missouri Intelligencer*, in Franklin, Missouri, also worried that his region was importing everything and exporting only cash. He was shocked that five or six stores in Franklin sent “12 or \$15,000 in cash” to the eastern cities each year, with perhaps \$80,000 to \$100,000 taken from the region as whole. Particularly



This 1817 bank note from the Bank of St. Louis includes the earliest known view of St. Louis, including flatboats—unmotorized predecessors to the steamboats. (Image: Eric P. Newman Numismatic Education Society/ Newman Money Museum, Washington University)



Bank notes like this one from the Bank of Missouri from 1819 were among the many kinds of paper currencies that circulated in places like St. Louis and the Missouri River valley. Since it was a bank of deposit for federal money, the Bank of Missouri survived the Panic of 1819 (unlike many banks). The image with a bust and sailing ships didn’t suggest a St. Louis-specific economy, but did reflect the relationship between mercantile and banking interests and the progress of the republic. (Image: Eric P. Newman Numismatic Education Society/ Newman Money Museum, Washington University)



This \$2 note from the Missouri Exchange Bank harkened to the agricultural foundations of the Missouri River valley as well, although it featured wheat instead of the more profitable tobacco in the region. (Image: Eric P. Newman Numismatic Education Society/ Newman Money Museum, Washington University)



Despite the letters in this article, some farms prospered along the Missouri River, especially those that grew into plantations during the 1820s. Often founded by Virginians who were younger sons of planters in the 1810s, they came to the counties along the Missouri River to raise tobacco with slave labor and ship it back east on steamboats. (Image: Old Sturbridge Village)

New Establishment.
WHOLESALE AND RETAIL.
Paul, Ingram & Reily
BEG leave to inform the citizens of Franklin, and the public generally, that they have just received and are now opening, in the building immediately back of the store occupied by Hickman & Lamm, a **LARGE AND COMPLETE ASSORTMENT OF**
Dry Goods,
Groceries,
Hard Ware,
Tin & Queens Ware;
 Together with
Saddlers' Hatters' & Shoemakers' Trimmings.
 All of which have been purchased for cash at the New-York & Philadelphia auctions, and which they are determined to sell lower than any heretofore offered in this place. Persons wishing to purchase will please to call and judge for themselves.
 67-Flax and Tow Linn and Bees wax received in payment.
 Honest Cash Money received by bank.
 Loan Office Collections, Auditor's Warrants, and all other papers fords whatsoever, received at their sales.
 Franklin, May 6, 1825. 40-41

The region offered more than agricultural commodities to consumers, as this advertisement suggests. A thriving class of “greedy merchants” grew, buying goods from an array of places and selling local goods. (Image: Mary Ambler Archives, Lindenwood University)

galling was the fact that this money was spent on “articles of European growth and manufacture.” The editor was certain that if even one half of this amount were used in promoting domestic manufactures, then both “the pecuniary and moral condition of the people” would be much improved. The *Intelligencer* editor not only decried the merchants’ economic choices but also denied that they could simply be dismissed given the broader moral implications. He did not ignore the role of the consumer, though, pleading with his readers to decrease their interest in “imported finery and foreign gewgaws.” Yet, he depicted the merchants as having a crucial role in shoring up the moral fiber of the community and showed how they were shirking their duty to lead.⁸

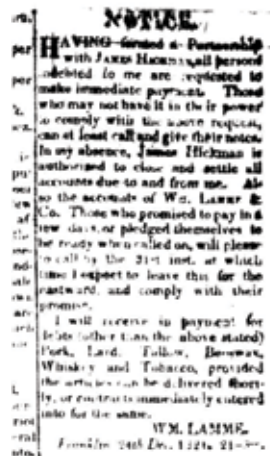
Several months later, “A Farmer of Howard [County]” wrote a letter to the *Intelligencer* that was even less circumspect about blaming the merchants for the region’s lack of cash. He warned the “agricultural part of the community” that because the merchants did not want to take the risk of exchanging their goods for produce, they would continue to force customers to pay in cash even if it meant great sacrifice for the customer. The difficulty, according to this farmer, was that the sacrifice was all by the customer and none by the merchants. In order to combat this selfishness, farmers, in his view, needed to

join together in order to induce the merchants to look to the greater good of the community and engage in barter for the farmers' produce.⁹

A carpenter joined in the discussion with a letter to the newspaper that expressed his agreement that the merchants needed to be disciplined. He saw great benefit for both farmers and common laborers if merchants could be convinced to accept Loan Office money, not just produce. This letter writer was certain that farmers and laborers together could "put down the merchants" by making their individual interests mesh. He proposed a network of local exchange to replace some of the need for the merchants' imports. He also suggested that farmers

and laborers should provide a good example for the merchants by accepting the Loan Office money as part of that exchange. Merchants, this author implied, were too focused on their own particular interests to see how they were hurting other members of the community.¹⁰ Despite these pleas, many merchants were particularly opposed to Loan Office certificates, believing that they were inadequately backed by specie to function as money.¹¹ A dinner, attended by many of the local merchants, was held at Franklin in mid-July 1821 to honor those representatives who voted against the Loan Office bill. After the dinner, an ironic toast was raised to the Loan Office, with those assembled proclaiming that it was "established by the desertion of every principle of moral and political honesty."¹² Opinions such as this seemed to many observers to illustrate the merchants' overriding self interest and their corresponding disinterest in the good of the whole community.

Others, however, came to the merchants' defense, or at least made distinctions among them. The editor of the *St. Louis Enquirer* differentiated between "merchants," who he said cared about their society, and mere "retailers," who had no real stake in the community. The former were deemed "liberal and patriotic" because "their interests are identified with those of their fellow citizens in general," and thus they could understand the importance of Loan Office money. In contrast, "retailers" were more concerned with their own profit than the good of the whole and thus refused to accept the new notes. He linked their lack of commitment to or interest in the progress of the whole community to their transient status; they came to the Missouri valley "to sell their goods for silver, and then to go home."¹³ Given that most of the white inhabitants of the



Notices like this one by William Lamme in the *Missouri Intelligencer* were not particularly uncommon. In an expanding economy in which credit was extended, notices like this were used as a precursor to suing debtors. (Image: Mary Ambler Archives, Lindenwood University)

area had only recently settled there, it is interesting that the editor drew an equation between stability (or lack of mobility) and true belonging in the community. Such criticisms also indicate the tensions between individuals and community in a market economy. If any one group pursued its own interest too single-mindedly, according to the editor of the *Enquirer* and others like him, the whole society would suffer.

Other than an occasional toast, Missouri merchants never really offered a direct answer to their critics. For example, they did not send letters to the editor in response to any of the numerous anti-merchant tirades in the Missouri newspapers during this time. There is a sense,

however, that they were not swayed by the arguments, as evidenced by the repetitious clamor against them. At the same time, a few merchants used their advertising space in the newspapers to offer a kind of public response to the complaints against them. Most often, merchants' ads were straightforward and simply noted the firm's name, location, and some particular goods that were for sale. Some merchants, however, elaborated on this basic form and indicated the terms on which they would sell their goods. William Lamme, one of the most prominent merchants in the town of Franklin, consistently indicated that he would sell his merchandise "alone for Cash in hand."¹⁴ Despite this resolve, he was not able avoid credit entirely.¹⁵ In his eagerness to close his past due accounts, Lamme was occasionally willing to take beef, pork, and other specified produce as payment. However, he insisted that new purchases needed to be made in cash.¹⁶

In 1823, William Lamme also offered an unusually lengthy advertisement that attempted to explain his position in more detail. "Having determined to sell alone for cash in hand," Lamme and his partner assured "their friends that their goods will be found at very reduced prices." While they found it painful to refuse credit even to those who had been punctual, they hoped their customers would see that this policy was an "absolute necessity." They were forced to use this policy, they said, because they had extended credit before and it had not been repaid. They also cited the difficulty of the times and the very small advance at which merchandise was then "vended in Missouri."¹⁷

Lamme's apologia in a sense pleaded with the people who had criticized him and the other merchants to see his side of the story. In order to provide the goods Missourians

wanted, Lamme had to participate in a wider economic network that required him to pay in cash. His insistence on cash was less of a selfish action than one that helped him better provide for the community's needs. Moreover, the form he chose for this statement—a paid advertising space instead of simply a letter to the editor—could also have helped show his commitment to the development of community institutions (though he did not emphasize this aspect in his advertisement). Lamme's personal biography could be another kind of answer to those who charged merchants with only short-term interest in the community. He did not quickly abandon the community but was in business in Franklin at least throughout the 1820s. Thus, Lamme did not live out the picture of exploitive retailers who were interested only in gouging the community and then moving on.

Ironically, as the effects of the 1819 Panic began to fade, some merchants became more likely to accept produce in payment (though what they would take was usually limited to a few items).¹⁸ Perhaps these merchants had finally listened to the entreaties of their fellow citizens. More likely, as the scarcity of cash eased somewhat, merchants felt less pressure to try and make all their transactions in cash. In any case, market development on the Missouri frontier was not a strictly linear proposition but could be shaped by the inhabitants to suit their changing requirements.¹⁹ Even William Lamme had softened his stance on exchange and by 1825 noted that he and his

partners would sell their dry goods “at fair prices for cash, or exchanged for Beeswax and furs.”²⁰

Besides hoping for potential benefits of Loan Office money and attacking local merchants during the hard times, Missourians tried to find other solutions for their economic woes. In 1822, residents in the St. Charles area formed an Agricultural Society intended to provide practical assistance to farmers. The letter writer “Agricola,” who identified himself as a farmer, hoped it would also reestablish the importance of the farmer in the view of merchants. Agricola believed that merchants had been distracted by their focus on “commerce and speculation” and had forgotten the importance of the farmers’ labor in procuring those riches.²¹ Another letter writer, who declared himself to have formerly been a farmer in Creve Coeur, pointed to the importance of broader community support for the Agricultural Society. According to the former farmer, the wealth of the whole community, and even its independence, was at stake because there were terrible implications for all if the farmers did not flourish.²²

As much as uplifting the farmer, this letter writer was also interested in pointing out how other members of the community would be called upon to support the Agricultural Society's ends, and most of his attention fell upon local women. The author suggested that they should each spend two hours a day of their “idle time” spinning or weaving. Calculating that there were 963 females between

By the late 1820s, the temperance movement was gaining strength—and with good reason. Average per capita consumption of pure alcohol for Americans age 15 years and older was just over eight gallons in the 1830s. “Grog shops” like this one were blamed as one culprit and, as this cartoon suggests, temperance was designed to protect women and children from drunk husbands and the resulting poverty. (Image: Library of Congress)



the ages of ten and 45 years in the county, he decided that their contribution to domestic manufacturing under his proposal would save the county the “enormous sum of \$17,650” per year. This former farmer had no doubt that women would happily follow his suggestion to better utilize their idle time because of their natural inclination to patriotism. The ex-farmer did not go on to clarify how the males of the county should fill their idle time. By focusing so much of his letter on women, he at least implied that they were particularly prone to spending too many hours in unproductive employment.²³

In the weeks that followed, these suggestions prompted a lively debate on the role and contributions of women to society. In response to the former farmer’s letter, “Lucretia” took it upon herself to defend her virtue and that of other women. She declared the former farmer’s argument “unreasonable” because men’s work, such as planting and plowing, necessarily had to be completed before women could spin and weave. Women were eager to do their duty, Lucretia said, but men first had to do theirs. In Lucretia’s observation, men were not contributing as they should, which in turn meant that there was no hope the women could do so. She laid the blame on “the infatuation and delusion of our village young men,” who were prone to wander purposelessly throughout the town, “thus rendering themselves as useless to community as sign posts themselves.”²⁴ Lucretia directly contrasted the dedication of the women in the community to the selfish unproductiveness of the young men. Idle and lazy, she suggested, were charges that should be laid at other community members’ feet.

Lucretia’s criticism caught the attention of one of those she disparaged, and he answered in the newspaper’s next issue with his own critique of her. Self-described “Idle Tom” accused Lucretia of forgetting her domestic duties in pursuit of “the scribbling mania.” The former made “the female character so endearing,” while the latter, he implied, had the opposite effect. Thus, in Idle Tom’s view, Lucretia sullied her character when she wrote letters to the newspaper, so he suggested she no longer “intrude” in public discussion. Clearly, he felt no compunction about reprimanding Lucretia by suggesting she return to her private activities. Idle Tom also wondered if she could offer some specific suggestions for profitable employment for young men because he had no doubt that they wanted to be “respectable, by becoming useful.” He did not clarify, however, the means through which she should inform him if she was not to continue to use the public press.²⁵

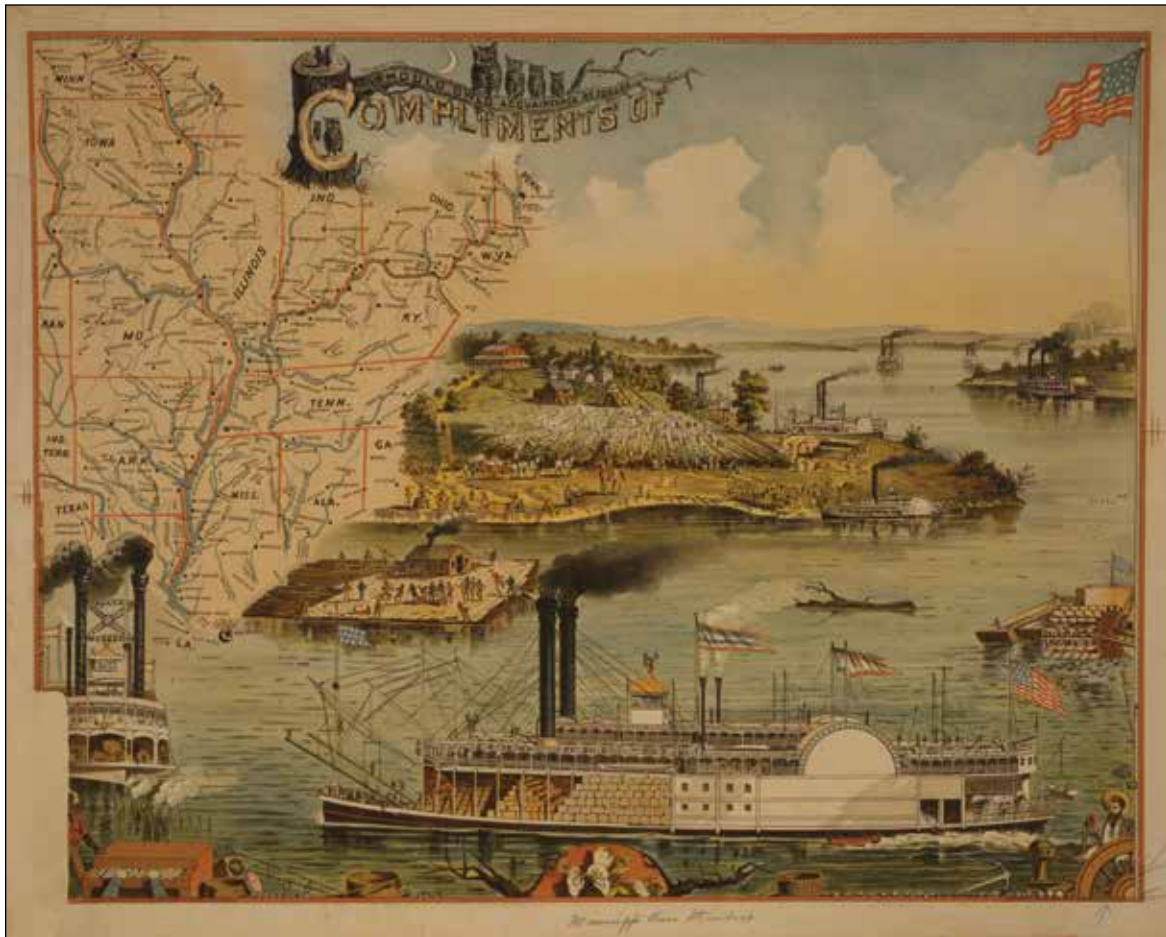
A letter writer who called himself “No Idler” came to Lucretia’s defense in the next issue of the newspaper. No Idler wondered how Idle Tom could be at loss for “profitable employment” given the variety of activities needed to cultivate the fertile land of the Missouri valley. No Idler also chastised Tom for his “snub” to Lucretia, and said he would respond for her since she had been “prohibited from appearing again in print” and might now be “perhaps darning some Idler’s old socks.” Although No Idler was clearly in agreement with Lucretia about the societal problems associated with Idle Tom and his

like, he did not offer a defense of her right to “intrud[e] herself upon the notice of the public.” Instead, he simply presented his own answer as an alternative to her further reply.²⁶

In any case, Lucretia did not heed Idle Tom’s suggestion to retreat to the domestic sphere. Instead she presented him with a list of reasons why members of the community might want to engage in a useful pursuit, including “for the purpose of keeping themselves aloof from indigence and effeminacy.” Where he had implied she was not a good woman, she in turn questioned his manhood, and went on to suggest that his laziness was a result of drinking too much liquor. In Lucretia’s view, men like Idle Tom were a public nuisance. Although she never directly defended her right to contribute to a public discussion of the community’s development, her rejoinder showed her willingness to engage with these issues when she saw fit. Moreover, Lucretia claimed a kind of economic citizenship for herself and, by implication, her fellow industrious women, even though she was excluded from the political variety. At the same time, she seized the right to point out on how little men like Idle Tom contributed to the public good even though he had more political access than she did.²⁷

While this letter marked the end of the exchange between Lucretia, Idle Tom, and their neighbors, the issues they raised came to the fore in particular because of the stresses of the economic situation of the early 1820s. After the worst effects of the Panic had subsided, the tone of public discussions shifted somewhat. Much like the merchants who began to take some crops in exchange for merchandise, some farmers came to emphasize the ways merchants could help the farmers achieve their economic goals, instead of the fears about how they might be thwarted. “A Farmer,” writing in 1825, considered the best way to bind the local community together. This farmer called for, what he called, “a natural organization of the duties of our citizens.” He believed this would be brought about when each inhabitant focused on his particular vocation and then sought to coordinate them to develop the resources of the country. In this vision, individual interests did not conflict but could mesh for the good of the whole if each community member realized the broader context of his or her action. A Farmer hoped that “individual security, wealth and happiness” would certainly lead to “general prosperity.” This was not simply a land of farmers, but a broader community that needed a variety of diverse yet complementary members.

This farmer thought that the best way to bring about harmony was to develop economic aspects that had lagged in the region, such as wheat growing and flour milling. In this way, farmers and merchants would be bound together because their individual interests would mesh closely. By such “mutual support,” the farmers’ demand for foreign articles would increase as their economic conditions improved, and the merchants could then expand their importation. The author was excited about the potential that could result from the “united patriotic exertions of our citizens,” but certain community members had more



Promotional prints like this one highlighted the importance of steamboats in Missouri and Mississippi river commerce. Steamboats were a symbol of prosperity and growth along the rivers, just as railroads or automobiles or jet planes would be for future generations. (Image: Library of Congress)

readily acknowledged roles. Perhaps he thought that women would be an important part of that increased demand for foreign articles, but in any case he did not include them explicitly in his letter. He did make sure to include the positive effects this unity would have on laborers, though, and assured them that they would have increased work opportunities.²⁸

Moreover, the expanded trade this writer called for resulted in the addition of an unwelcome level of diversity to the local community. The boats that the farmers and merchants needed to transport goods to and remove exports from river towns on the Missouri also brought boatmen to town. These river workers provided the necessary labor to move the goods and crops of the river valley, which were so crucial to the area's economic development. Yet, while their work was appreciated in the river towns, their presence, or more precisely their uncontrolled mobility, was not. Most often their stay was only temporary, but even that could prove disruptive to the local community. For example, the "citizens" of Franklin "were alarmed by" the 50 boatmen who assembled in the public square in May 1822. The boatmen had weapons

and attacked the town jail, though there was no one in it at the time. The locals responded promptly and, while most of the boatmen escaped, 17 were apprehended. They were kept overnight in the very jail they had attacked but released the next day upon payment of a fine, and presumably continued their trip up the Missouri with their boats. The editor of the local paper concluded that the attack was "a mere act of wantonness," and he hoped that any subsequent offenders would be punished much more harshly.²⁹

These particular boatmen were only in Franklin briefly on their way from St. Louis to Council Bluffs, but later that year the town was beset by a more lingering but also related problem. Locals complained of "strollers in our streets" comprised of discharged soldiers from Council Bluffs, some free blacks, and many unemployed boatmen. Not only were these men not a part of the usual local community, they also disrupted it. The Franklin newspaper complained that the newcomers would "occasionally carouse and enjoy themselves at the expense of good order and decorum." In order to combat this problem, a "respectable number of the citizens of Franklin" gathered

at the courthouse to form a regulatory committee to help the local authorities take care of any rowdiness that might result from those less invested in the community.³⁰ The “citizens” at the meeting seemed certain that the “strollers” did not have much of a place in the community, in spite of the important role these mobile outsiders played in its economic development and protection. Where newspaper editor Robert M’Cloud had hoped all Missourians would forge a “bond of fraternal concord,” these citizens preferred a looser connection.³¹ They did not want to entirely exclude the boatmen, for their economic dreams hinged on the mobility they offered. However, they did want to control and limit the movement of these disruptive elements.

Negotiations about the balance between whole and parts of society echoed at many levels in Missouri at the time of the Missouri Compromise. Missouri’s progress to statehood had sharpened the conflict within the country about the spread of slavery. Missouri had had to coordinate its own interest in having slavery with other national interests, some of which were antithetical to its own. Moreover, the compromise that was brokered to allow Missouri’s entry did not completely or finally resolve the issue of the expansion of slavery, much as the end of the Panic did not remove the economic conflict among the settlers. Together, these aspects illuminate the ongoing debates about the shape of community. Missourians struggled to understand how difference, in this case

over economic roles and the moral construction of the community, could be combined in a unified, operational whole.

While the Panic of 1819 brought to the fore debates about the relationship between different economic groups in society, it did not cause a major reordering of it. Missourians stressed the need to align individual interests with the good of the whole and suggested ways that that might be achieved. Yet the best interest of the whole was not always defined precisely the same way, and opinions differed as to the exact balance of individual interests that would achieve it. As we have seen here, discussions about merchants, women, and boatmen exposed the fault lines within the society, which did not entirely retreat even as the effects of the Panic wore off. Merchants and farmers tried to find ways to meet both their needs in an increasingly commercially oriented economy. For women, the path was less clear. While Lucretia made the case for the importance of women’s contributions, most often women were not part of, or a subject in, the public negotiations. Meanwhile, mobile boatmen faced increased regulation but also seized opportunities presented by the need for their movement. The community of the new state was fraught and contested, and would continue to be so, but the public culture that was being created provided space to debate the moral economy of the community even if not all discussions turned into outright challenges or dramatically shifted its makeup.

ENDNOTES

- ¹ *Missourian* (St. Charles, Missouri), June 24, 1820.
- ² David D. March, "The Admission of Missouri," *Missouri Historical Review* 65 (1971) : 427-49; William E. Foley, *The Genesis of Missouri: From Wilderness Outpost to Statehood* (Columbia: University of Missouri Press, 1989), 293-98; Perry McCandless, *A History of Missouri: Volume II, 1820-1860* (Columbia: University of Missouri Press, 1971, 2000), chapter 1; and Louis Houck, *The History of Missouri: From the Earliest Explorations and Settlements until the Admission of the State into the Union*, vol. III (Chicago: R. R. Donnelley & Sons Company, 1908), chapter 29.
- ³ *Missourian*, June 24, 1820.
- ⁴ For further description of the local effects of the Panic of 1819, see McCandless, *History of Missouri*, 23-30; Hattie M. Anderson, "Frontier Economic Problems in Missouri, 1815-1828," Part I, *Missouri Historical Review* 34 (1939-1940): 48, 52-53, 58-59; and R. Douglas Hurt, *Agriculture and Slavery in Missouri's Little Dixie* (Columbia: University of Missouri Press, 1992), 16-22.
- ⁵ See McCandless, *History of Missouri*, 26-28, and Hurt, *Little Dixie*, 17-19.
- ⁶ *Missouri Intelligencer*, April 23, 1821.
- ⁷ *Missourian*, May 23, 1822. Letters to the editor in this period were commonly signed with a *nom de plume*.
- ⁸ *Missouri Intelligencer*, April 23, 1821.
- ⁹ *Ibid.*, August 14, 1821.
- ¹⁰ *Ibid.*, September 4, 1821.
- ¹¹ McCandless, *History of Missouri*, 26.
- ¹² *Missouri Gazette and Public Advertiser* (St. Louis), August 8, 1821. From the names listed, I have been able to identify a number of those who gave toasts as local merchants. In fact, those gathered got their wish early in 1822 when the Loan Office certificates were declared unconstitutional. McCandless, *History of Missouri*, 28.
- ¹³ *St. Louis Enquirer*, September 8, 1821.
- ¹⁴ Hurt describes Lamme as "the most successful large-scale merchant in Franklin" (*Little Dixie*, 7). *Missouri Intelligencer*, December 25, 1821. Lamme, who was for a time in partnership with J. Hickman, used this phrase or very similar ones in all his ads during the period.
- ¹⁵ Hurt, *Little Dixie*, 21.
- ¹⁶ *Missouri Intelligencer*, December 25, 1821. Lamme was not the only merchant to specify he would take produce for old debts but cash for new goods, but the prominence and explicitness of his regular ads may have particularly sparked the ire of those who felt oppressed by such measures.
- ¹⁷ *Missouri Intelligencer*, August 26, 1823. Hurt notes that in 1820 Lamme "tried to sell merchandise for cash ... but necessity forced him to sell on credit and take goods in barter to stay in business" (*Little Dixie*, 21). As this ad shows, Lamme's commitment to cash exchanges extends beyond 1820. I do not dispute Hurt's claim (on the same page) that "[a] pure cash economy remained impossible," but it seems noteworthy that as much as he could Lamme fought the necessity to barter and take credit.
- ¹⁸ For example, a Paul, Ingram & Reily ad in the May 6, 1823, *Missouri Intelligencer* states: "Flax, Tow Linen and Bees wax received in payment." James Ross, a merchant at Chariton, said he would sell for cash "or such trade as may suit him." (*Missouri Intelligencer*, May 8, 1824). For a discussion of the importance of credit in a frontier economy, see William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York: W. W. Norton & Company, 1991), 319-23.
- ¹⁹ This trend in some ways is the opposite of the traditional "frontier" model, which finds that things get more implicated in the market as time goes on.
- ²⁰ *Missouri Intelligencer*, December 2, 1825.
- ²¹ *Missourian*, May 16, 1822.
- ²² *Ibid.*
- ²³ *Ibid.* For a discussion of women's work in frontier settlements, see John Mack Faragher, *Sugar Creek: Life on the Illinois Prairie* (New Haven, Connecticut: Yale University Press, 1986), 151-55.
- ²⁴ *Missourian* (St. Charles, Missouri), May 23, 1822.
- ²⁵ *Missourian*, May 30, 1822. Idle Tom also suggested that "Lucretia" was not actually a woman but might be "one who hopes to find safety under petticoats."
- ²⁶ *Missourian*, June 6, 1822.
- ²⁷ *Ibid.* Lucretia also disparaged Idle Tom's lack of education and deliberately quoted the words he misspelled.
- ²⁸ *Missouri Republican* (St. Louis), November 5, 1825.
- ²⁹ *Missouri Intelligencer*, May 7, 1822. Presumably the boatmen's fines were paid by their superior on the boat and later withheld from their wages. For more on the boat workers on the Missouri River, see William R. Swagerty, "A View from the Bottom Up: The Work Force of the American Fur Company on the Upper Missouri in the 1830s," *Montana* 43 (1993): 18-33.
- ³⁰ *Missouri Intelligencer*, October 15, 1822.
- ³¹ *Missourian*, June 24, 1820.



St. Louis Central Library at

100

BY JEAN GOSEBRINK



In 1901, philanthropist Andrew Carnegie gave the City of St. Louis \$1 million, half to be spent on construction of a Central Library building and half on neighborhood branches. At the beginning of the twentieth century, St. Louis Public Library was poised for expansion. It looked forward to increasing collections, library use, and the size of its building.

The St. Louis Public Library's origins were in the Public School Library and Lyceum, a private subscription library established in 1865 by St. Louis Superintendent of Education Ira Divoll and others affiliated with the public schools. In 1869, its operations were officially transferred from the Library Society to the St. Louis Board of Education. Frederick Morgan Crunden became its second librarian in 1877.

A dynamic leader, Crunden promoted the public library as the "people's university," and advocated its expansion into neighborhood branches and conversion to a free, tax-based, citywide service. He worked for passage of a new state law that in 1885 authorized cities in Missouri to levy taxes for public library services. In St. Louis, his advocacy saw its fruition in the April 1893 election in which St. Louis voters approved moving administration of the Library to an independent board of directors and taxing themselves for its support. The Library and its collections were transferred to control of the new board on March 1, 1894, and the Library opened free to the public on June 1.

By the mid-1890s, the St. Louis Public Library, recently independent of the St. Louis Board of Education, occupied quarters on the top two floors of the new Board of Education building at Locust and 9th streets and was looking for "adequate room for a growing institution and proper accommodations for its ever increasing patronage." Library promoters had in mind "an edifice which will not only fill present and prospective demands, but be an ornament to the city... a library building worthy of the fourth greatest city of the Union."

The attempts of St. Louis Public Library to levy a building tax in popular elections in 1897 and 1898 had been defeated. The library board corresponded with steel magnate Andrew Carnegie, who had embarked on what he called his "wholesale" period of providing funds for library construction. The board also sent the Reverend Samuel Jack Niccolls to New York to persuade Carnegie in person to donate funds for a St. Louis Library. Niccolls, an acquaintance of Carnegie's and friend of Carnegie's pastor, proved successful.

St. Louis officials and citizens promptly moved to take advantage of Carnegie's offer. On April 2, 1901, St. Louis voted 73,646 to 10,184 in favor of a tax of two-fifths

As you enter the building from Locust Street and step inside the Atrium, you'll be amazed by its vastness and brightness—three stories of windows and white tile walls flood the space with light. You can stop in the café for a bite and a drink as you read a magazine or newspaper. Then check out the Discovery Wall screen for a look at cool library stuff.

New York: 12th March 1901.

Dr S.J. Nicolls,
2651 Washington Ave, St Louis, Mo.

Dear Sir,

In reply to yours of March 5th. It would be a great mistake in my opinion to spend a million dollars upon a Central Library Building. The masses are best reached by Branch Libraries, and the Central Building is much less important than before. If the city of St Louis will agree to tax itself and expend not less than \$150,000 per annum on its Library System I shall be glad to give \$500,000 for a Central Library, and also \$500,000 to be expended hereafter in Branch Libraries as these are needed, the city to furnish sites for the Libraries and the money I give to be used for the Buildings.

Greater Pittsburgh spends over \$100,000 a year on its Library System, and Buffalo of much less population than St Louis spends over \$140,000; Boston also with less population than St Louis appropriates \$300,000 for its Libraries annually, so that \$150,000 cannot be considered excessive.

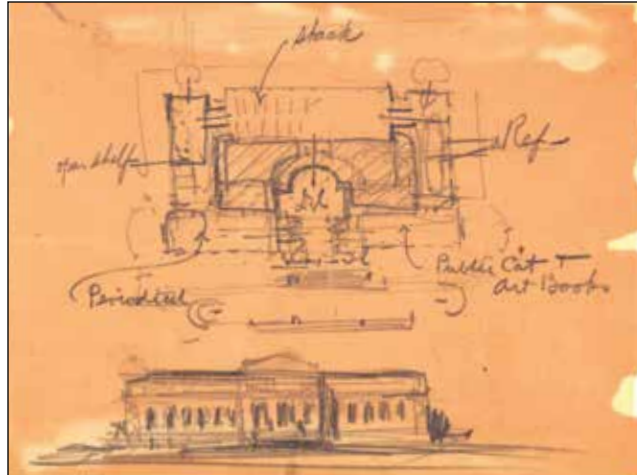
Care should be taken in making contracts for the Central Building, to leave a margin for contingencies. The buildings should be dignified, but not ornate. The building is only the frame; the treasures of a Library are within.

Very truly yours,
Andrew Carnegie

The Library Board chose Gilbert after a national competition. Architects submitting plans included the New York firm Carrere & Hastings and St. Louis architects William B. Ittner; Eames & Young; Mauran, Russell & Garden; Theodore C. Link; and Barnett, Hanes & Barnett. Gilbert's quick sketch shows strong elements of the basic design that can be seen in the completed building. Gilbert had designed Festival Hall and the Palace of Fine Arts (now the St. Louis Art Museum, the only main exposition building designed to be permanent) for the 1904 Louisiana Purchase Exposition. In January 1912, the new massive granite and marble Central Library opened (the site of the former St. Louis Exposition and Music Hall).

of a mill on the dollar for use of the Library. Carnegie's other stipulations were also met as sites for new buildings were secured. Between 1906 and 1912, six neighborhood branches and the Central Library were built from Carnegie funds. The grand Central Library, occupying the entire city block between Olive and Locust and 13th and 14th streets in downtown St. Louis, opened to the public amidst great fanfare on January 6, 1912.

Around the turn of the 21st century, serious discussion began about restoring and renewing Central in order to bring it up to contemporary building standards as well as provide it with the resources necessary to keep it relevant in the fast-changing "Information Age." After feasibility studies had been completed and designs had been reviewed, the decision was made to commence with



Sketch of Central Library by New York architect Cass Gilbert, circa 1908.

the enormous project. Central Library closed to the public on June 14, 2010, with the goal of reopening during its Centennial year.

With a \$70 million total budget (\$20 million raised by the St. Louis Public Library Foundation's "Central to Your World" capital campaign and \$50 million procured in bonds), the library board and administration worked closely with Cannon Design principal George Nikolajevich, FAIA; general contractor BSI Constructors; and a small army of subcontractors to ensure that the project remained on time, on budget, and up to expectation. Most importantly, the library's patrons were not to be inconvenienced by the closure—all normal library services would continue at the library's 16 branch locations throughout the city.

The project was daunting. The library's massive, 4.7 million-item collection was moved off-site (at a rate of 50,000 items per day), and staff was relocated to make way for construction crews. From that point on Central Library was a hive of activity, with tradesmen and women of every description working in what seemed to be chaos, but was in reality a finely choreographed ballet. The dance would last for two and a half years.

In the waning months of 2012, workers put finishing touches on their handiwork and Library staff became reacquainted with "their" Library. So much had changed. The historic Great Hall, foyer, and reading pavilions had been fully restored to their original splendor while being fitted with fully updated mechanical and electrical systems. Broadband infrastructure, HD Discovery Walls, and wireless web had been installed throughout the building. The former seven-story glass stack tower, which contained the bulk of the collection, was removed and replaced with a soaring atrium. Modern, high-density storage space was added throughout the building. A state-of-the-art, 250-seat auditorium was carved out of lower level space originally used for coal storage.

When the Grand Reopening Day finally arrived, more



Opening ceremonies for Central Library were held on January 6, 1912. Scrapbook: Opening of the Central Building; Program of Exercises, Invitations, Acknowledgements, etc., 1912, St. Louis Public Library Archives.

Guests from other cities as well as citizens of St. Louis identified prominently with civic and educational life received invitations for the exercises held in Central Library's Great Hall. Cass Gilbert accepted the invitation, while others, including librarians from the New York Public Library, Howard University, and the Imperial Library of Japan could not attend. Over 700 attended the opening in Central Library's Great Hall, where a "flashlight photograph" was taken of those present for the occasion. On the program were Episcopal Bishop Daniel S. Tuttle, who made the invocation; Dr. Herbert Putnam, librarian of Congress; the Hon. John H. Gundlach, president of the St. Louis City Council; John F. Lee, vice president of the Library Board, and librarian Arthur E. Bostwick; Gilbert delivered keys to the building to Board president George O. Carpenter. Archbishop John J. Glennon ended the exercises with a benediction. During and after the formal program the whole building was open for public inspection.

than 1,000 eager patrons and dignitaries gathered on Central's massive, restored Olive Street steps and plazas. After a brief ceremony, the crowd was let in to inspect their beloved Library. The atmosphere was electric as masses of people rushed through the bronze gates, eager to behold the changes and new features their old friend had in store for them. Ohs and Ahs immediately filled the restored foyer as the crowd looked up at the ceilings and continued to make their way into the magnificent Great Hall, the newly decorated and refurbished Fine Arts Room, and the Entertainment, Literature, and Biography Room. The new Locust Street entrance welcomed guests with its dramatic stainless steel canopy with etched columns and an infinity water treatment. Visitors were delighted as they made their way to the revitalized first floor that

now held the new Center for the Reader, Children's Library, Teen Lounge, Studio, and Science & Technology, Patents and Trademarks rooms. The Creative Experience was a must stop for everyone visiting the Library that day. Its advanced technology wowed all, proving that an old building could be transformed into the Library's "crown jewel" for the 21st century. On the third floor, an 83-percent increase in public space gave the Genealogy, St. Louis, Special Collections, and History and Geography rooms much needed room to display books and items that researchers find invaluable. In addition, several conference rooms, computer areas, and a café have been added. Before the day had ended, more than 4,000 patrons had experienced the new Central Library.



Stack tower, 1912. F.D. Hampson Commercial Photographer.

The stack tower, a block-long structure built of steel seven stories high, was constructed within the north wing (the Locust Street side) of the building. The stacks housed the majority of Central Library's collection of millions of books and periodicals. Glass floors in the stacks allowed light to penetrate through the area. Original pieces of glass from the stacks are used behind the atrium desk in the renovated Central Library.



Book cleaning vacuum machine, 1928. F.D. Hampson Commercial Photo Co.

A Library employee uses a portable electric vacuum machine in the stacks. "For all cleaning where dust is dry and adheres loosely, these cleaners do excellent work, though they will not remove oily or greasy dirt that cannot be blown away, such as the fine sooty layer deposited on books and furniture from soft-coal smoke. This must be wiped by hand, no mechanical device having yet been found that will remove it." Machinery in the Library by Arthur E. Bostwick, 1928, separate in 1927-1928 Annual Report.

The Open Shelf Room, 1920.

One of the library's grand reading rooms, the Open Shelf Room provided access to Central Library's circulating collection. Here readers could browse the shelves for the classics and new books and check them out of the library. At Central's opening the Open Shelf Room contained 25,000 volumes of circulating books. With the exception of books in the Open Shelf and Children's rooms, other Central collections were marked for in-library use only. The wooden beamed ceiling is decorated with delicately painted symbols of learning, wisdom, and strength.





"Once upon a time" storytelling at Central Library, 1912. A.W. Sanders Commercial Photographer.

Librarians drew upon fairy tales, myths, and legends from King Arthur, Chaucer, Shakespeare, and other classics. As Effie Powers, head of the Children's Department, pointed out, "The children ask for the book after hearing a story which they enjoy."

A corner of the Children's Room, 1912. A.W. Sanders Commercial Photographer.

Unlike other public libraries of the nineteenth century, St. Louis Public Library had no age restrictions and encouraged children to use the library. The library's 1912-1913 Annual Report stated that the Children's Room was used by children from all parts of the city, "but it is also a neighborhood library where the Russian Jew and his Italian brother touch elbows with the negro child who has the same taste in books. The only rule is cleanliness and good behavior, and a spirit of democracy rules." The dedicated Children's Room had ceiling beams decorated with the titles of children's books—Charles Dickens' *A Christmas Carol* and Tom Brown's *School Days* can be seen on the beams in the photograph. The fireplace tiles, produced by the Moravian Tile Works of Doylestown, Pennsylvania, depict scenes of Native American activities, including "Starting a fire" and tiles based on medieval and renaissance motifs, like the whimsical "Centaur of Nuremberg" and the more stylized "Little Castle" and "Fleur de Lys."





Catalog Room, 1922. F.D. Hampson Commercial Photo Co.

A wing on the third floor housed the Catalog Department, where department staff ordered, processed, cataloged, and classified books and periodicals. In 1922, staff added 46,765 volumes to the Library collection and filed 148,097 cards in various catalogs.



A basement originally used for the furnace and coal storage has been transformed into a 250-seat acoustically excellent auditorium for author events and concerts. It has state-of-the-art audio visual capabilities and a new Green Room.

One of the stunning new additions to Central Library is the energy efficient LED exterior lighting.





Great Hall, 1925. F.D. Hampson Commercial Photo Co.

The Great Hall occupied the full length and width of the central pavilion of the Library. The walls and floor of the room were made of Tennessee marble. The molded plaster ceiling was decorated in gold, picked out with color. The library's public card catalogs were massed in the room. Here library patrons stand before the delivery desk waiting for books from the stacks. Ten decades of patrons had worn down a section of the marble in front of the desk making the floor uneven. The section of the floor was replaced in the recent renovation.





The Forest for the Trees:

The Benefits
of the Trees
of Forest Park

BY JOHN L. WAGNER

Forest Park in St. Louis, Missouri, has been the focus of a major restoration effort in the last decade. As part of a study on the sustainability of Forest Park, I looked closely at the trees in the park and the role they play in a sustainable urban park. I examined the benefits of the trees, from their potential to improve air quality by absorbing greenhouse gases resulting from man-made pollution, to their ability to intercept stormwater throughout the park. Another, often underappreciated aspect of trees is their aesthetic benefit, accounting for a surprising 75% of the trees' total annual benefits. My study specifically examines the distribution and the variety of the trees throughout the park, their size/age distribution, the increasing level of the park's tree biodiversity, and the evolving condition.¹ This assessment includes the trees in the "developed" portions of the park, although the forested areas are briefly mentioned. The tree canopy in the developed areas of Forest Park covers 161.2 acres, or 12.4% of the park's 1,298 acres. These developed portions comprise most of the area in the park – 92.3% – and include places such as the ground between the museums, the golf courses, picnic areas, the zoo, Art Hill, etc. The forested areas, essentially the Kennedy Forest and the Successional Forest, contribute another 73.1 acres of canopy cover, or 7.3% of the park's area. These forested areas are what we traditionally consider a "forest" to be: a large mass of trees. This distinction between the developed and forested areas of the

park is important in this study as the benefits of these trees are derived differently. Just over two-thirds of the tree canopy (67.7%) lies in the developed portion of the park, with the remainder in the forested areas and the wetlands.

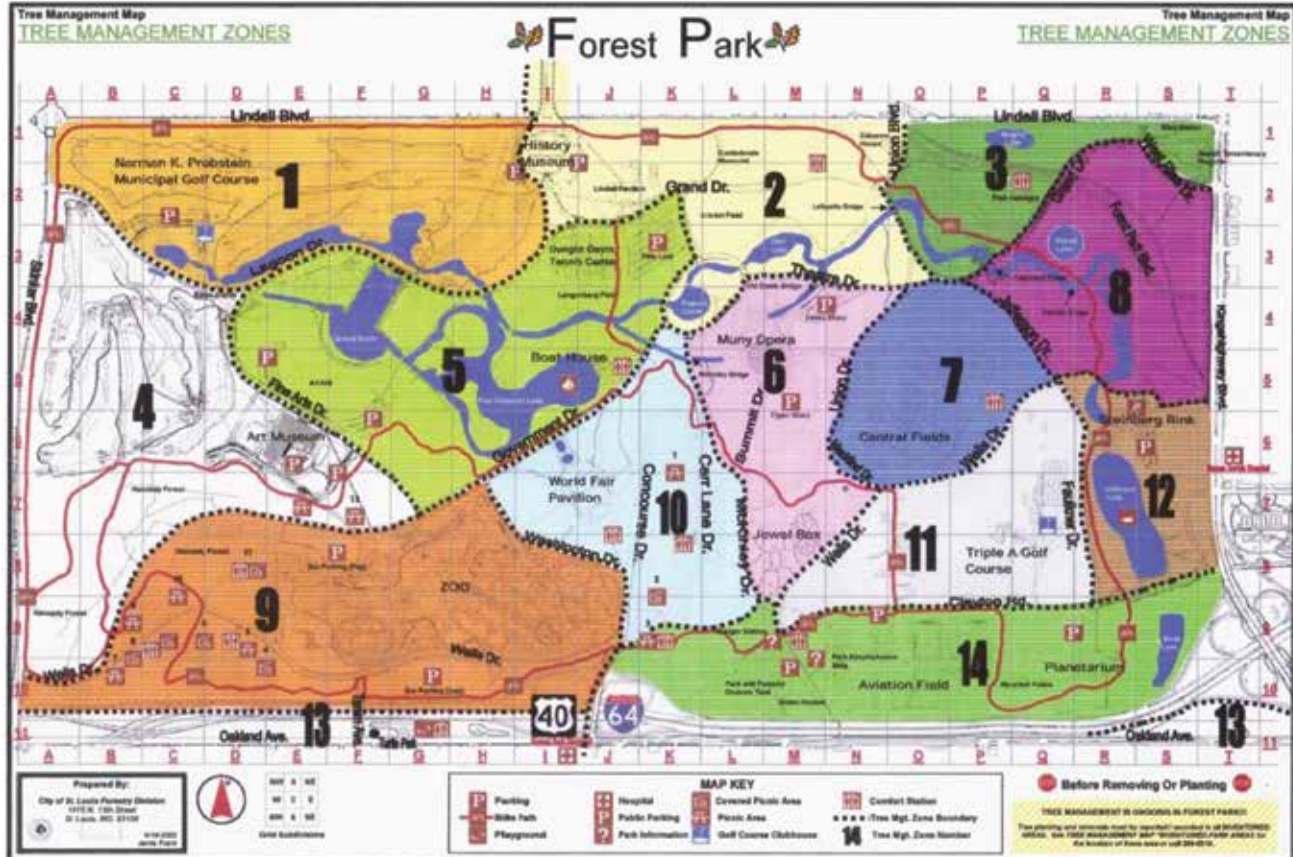
The benefits of the trees in the park correlate directly with the tree canopy cover. This is the amount and distribution of leaf surface area when viewed looking down at the tree's crown. The greater the leaf surface area exhibited by a tree, the greater its canopy cover and, as a result, the greater the benefits that particular tree is likely to provide. Trees with large leaves and spreading canopies tend to produce the most benefits.

Tree Distribution in the Park

Forest Park's tree population is dominated by broadleaf-deciduous trees, or trees that lose their leaves in autumn, encompassing 80.9% of the total population, while coniferous trees (pine, spruce, and fir trees) comprise 17.8% and broadleaf-evergreen trees, such as hollies and magnolias, consisting of 1.3% of the total. Broadleaf trees usually have larger canopies than coniferous trees, and because most of the benefits provided by trees are related to leaf surface area, large, broadleaf trees generally provide the highest level of benefit.

The Forest Park i-Tree Analysis (2011)², from which much of the data on the park's trees is derived, divides the park into fourteen Tree Management Zones, as illustrated

Figure 1. Forest Park Tree Management Zones



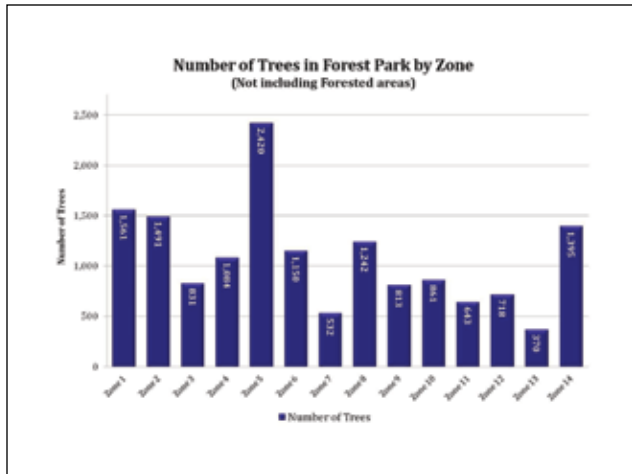


Figure 2. Number of trees in Forest Park’s developed areas, by zone.

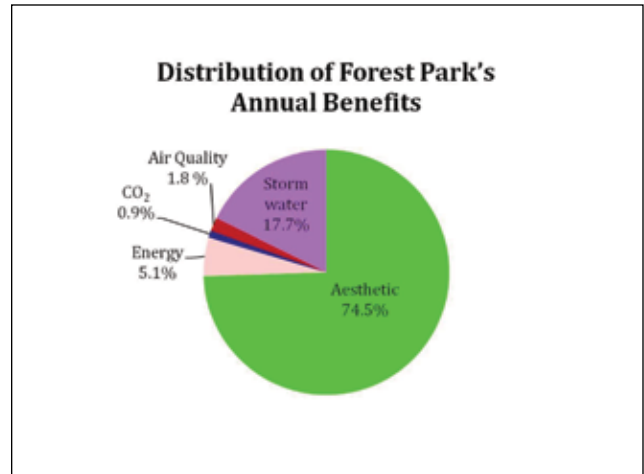


Figure 3. The annual distribution of the benefits of Forest Park’s Trees.

in Figure 1. i-Tree Streets is an urban forest manager’s tool developed by researchers at the United States Department of Agriculture (USDA) Forest Service, Pacific Southwest Research Station’s Center for Urban Forest Research in Davis, California. The purpose of i-Tree Streets is to enable a community to assess its public tree resource by calculating its structure, function, and value. The tool was originally designed to measure the benefit and value of street trees, but it has been adapted here for use in an urban park.

Figure 2 provides information about the total number of landscape trees in each of these zones. Zone 5, where the Grand Basin and Post Dispatch Lake are located, has the most trees in its developed landscape of the Park and includes 2,420 trees, 16.0 percent of all inventoried trees. Zone 13, near the southeast corner of the park, close to the Saint Louis Science Center and the Interstate 64 / Kingshighway Boulevard interchange, is the least populated, with only 370 trees, or 2.4 percent of the total population. Zone 7, site of the Central Fields, also has relatively few trees, 532, only 3.5 percent of the total.

The Benefits of Forest Park’s Trees

Figure 3 shows the distribution of the benefits of Forest Park’s landscape trees. The aesthetic nature of trees provides the largest portion of the annual benefits, 74.5 percent of the total. Environmental services contribute the remaining 25.5 percent. Environmental benefits include stormwater mitigation, accounting for 17.7 percent of the total annual benefits, energy savings which account for 5.1 percent; air quality improvements accounting for 1.8 percent; and carbon dioxide (CO₂) reduction, contributing

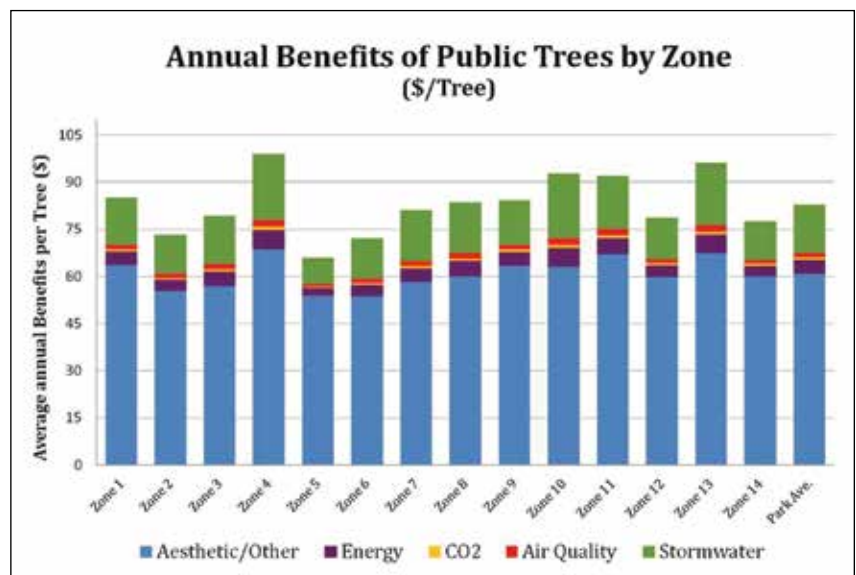
0.9 percent of total annual benefits. Leaf surface area, population, and canopy cover determine a tree population’s ability to produce benefits. The more canopy cover Forest Park has, the more benefits it will generate.

Figure 4 illustrates the average annual benefit per tree, in dollars, by zone. Note the more even distribution of benefits than the actual number of trees across the same area shown in Figure 2, likely due to the difference in the age and species of the trees in these areas.

Aesthetic Benefits

It is difficult to place a dollar value on the benefit Forest Park’s landscape trees provide to the overall well-being of the park. Trees provide beauty in the urban landscape, improved human health, a sense of comfort and place, and habitat for urban wildlife. Part of the aesthetic benefit

Figure 4. Average annual benefit per tree, in dollars, by zone.



reported in the 2011 i-Tree analysis for Forest Park includes property values of the land on which trees stand. This quality is difficult to substantiate, particularly for public park land. Nonetheless, I'm going to stand by the report's 74.5% annual benefits attributed to aesthetics for two reasons.

First, the property value component is not completely unjustified, as the homes along Lindell Avenue, running east-west, just north of the park demonstrate. The argument could be made that these affluent homes, not to mention the upscale Central West End neighborhood, among others, would not exist in their current state if not for Forest Park. Indeed, this effect was envisioned by the park's designers. St. Louis real estate agent Andrew McKinley, citing examples of Central Park in New York City, noted at the time, "In the course of fifteen years the increased value of the surrounding property would return the cost of the park three times over in taxation."³

Secondly, many scholars, specifically John Dwyer, Herbert Schroeder, and Paul Gobster,⁴ point out people have a strong attachment to trees in the urban landscape. Be it a sensory or a symbolic meaning, people are attracted to trees. I would argue that this attachment and association with the park's trees is also included in the 74.5 percent of the annual benefits. In short, Forest Park would not be the park it is today if it were not for its trees.

In that context, the aesthetic, social, and economic benefits, among other non-tangible related benefits, provide an estimated \$902,313 annually to Forest Park, for an average of \$59.71 per tree.

Energy Savings Benefits

Trees conserve energy in three principal ways:

1. Shading reduces the amount of radiant energy absorbed and stored by built surfaces, commonly referred to as the "heat island effect."
2. Transpiration of water from the leaves' surface converts moisture to water vapor and cools the air by using solar energy that would otherwise result in heating of the air. This, in addition to lack of a heat island effect, is one of the reasons parks are generally a few degrees cooler than the surrounding areas.
3. Trees deflect and slow the wind that would otherwise directly strike buildings, resulting in less conductive heat loss where outside air normally enters the building, e.g., glass windows. Windows that are "drafty" may seem less so if a tree were planted right outside the window.

Shading and climate effects from Forest Park's landscape trees are estimated to provide annual electric and natural gas savings equal to 681.7 Megawatt-hours (\$53,175) and 15,216.4 therms (\$8,059), respectively. Forest Park saves a total of \$61,234 per year over the whole inventoried tree population (15,111 trees), resulting in an estimated average annual savings of \$4.05 per tree in the developed portions of the park.

Atmospheric Carbon Dioxide (CO₂) Reduction Benefits

Trees reduce atmospheric carbon dioxide (CO₂) in two ways:

1. Directly, through sequestration of CO₂ as woody and foliar biomass as they grow.
2. Indirectly, by lowering and, thus avoiding, the demand for additional heating and air conditioning (see Energy Savings Benefits), thereby reducing emissions associated with electric power production and consumption of natural gas.

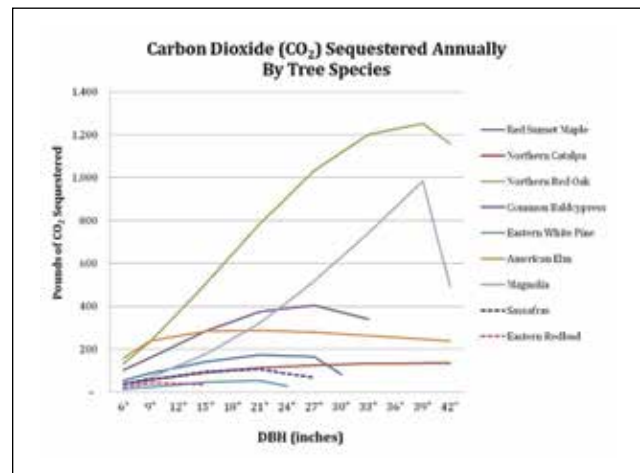
Trees sequester ("lock up") CO₂ in their roots, trunks, stems and leaves as they grow, and in wood products after they are harvested. The benefits of reduced CO₂ correlate directly with woody biomass and leaf surface area.

By tree type, pin oak provides the most CO₂ benefit (\$1,802), accounting for 15.9 percent of the total annual CO₂ benefit in the park, followed by northern red oak (\$837), shingle oak (\$777), and American sycamore (\$567). White oak is shown to provide the greatest benefits per tree (\$2.49) followed by shingle oak (\$2.48), pin oak (\$2.33), and northern red oak (\$1.74). As expected, smaller-sized trees, such as apple and eastern redbud provide CO₂ reductions at a lower rate than larger trees; their annual benefits equal \$0.19 and \$0.10, respectively.

Figure 5 shows the pounds of CO₂ sequestered per tree annually as it matures.⁵ "DBH" – the "diameter at breast height" – is an indicator of the age of a tree. For example, a 6-inch DBH tree is a much younger tree than a 27-inch DBH tree. The graphic shows a wide-ranging ability of individual species to sequester CO₂ as they mature. Not surprisingly, the northern red oak ranked far ahead of the other species listed. The American elm actually started out by sequestering more CO₂ than the northern red oak at 6-inch DBH, but it quickly levels out and does not sequester much more CO₂ in its mature stage.

If sequestering CO₂ was all park managers were interested in accomplishing with a tree planting campaign, we would see many more oak trees planted throughout the

Figure 5. Pounds of CO₂ sequestered per tree annually by species.



park. However, as will be noted throughout this article, managers need to consider a number of issues when deciding what tree to plant in a particular location. While these numbers can be useful in knowing how much CO₂ is being sequestered, other issues need to be considered as well. As an example, the Eastern white pine, while ranking low in CO₂ sequestration (one of the lowest of the nine shown in Figure 5) due to the fact that it has needles instead of broad leaves, is an excellent tree for providing a wind break, particularly in the winter when its pine needles are still on the tree.

Air Quality Benefits

Trees improve air quality in five fundamental ways:

1. Absorbing gaseous pollutants, such as ozone (O₃), sulfur dioxide (SO₂), and nitrogen dioxide (NO₂), through leaf surfaces.
2. Intercepting particulate matter (PM₁₀)⁶, such as dust, ash, dirt, pollen, and smoke.
3. Reducing emissions from power generation by reducing energy consumption. If planted in the right location, trees provide an indirect benefit of reduced air pollutant emissions that result from energy production.
4. Releasing oxygen through photosynthesis.
5. Transpiring water and providing shade, resulting in lower local air temperatures, thereby reducing ozone (O₃) levels.

The Forest Park i-Tree Analysis (2011) determined that each year Forest Park’s landscape trees provide a savings of \$8,538 by intercepting 9,262 pounds of gaseous air pollutants in the form of ozone (O₃), nitrogen dioxide (NO₂), small particulate matter (PM₁₀), and sulfur dioxide (SO₂). These pollutants are largely the result of energy consumption through the burning of fossil fuels.

By tree type, pin oak (1,049 pounds, \$487), American sycamore (657 pounds, \$604), Austrian pine (519 pounds, \$487), and northern red oak (483 pounds, \$445) intercept the greatest amounts of air pollutants per year due to their

size and prevalence in the landscape tree population, accounting for 23.7 percent (\$2,023) of the total annual benefits. Small-growing trees such as apple (103 pounds, \$95) and eastern redbud (86 pounds, \$79) contribute the least relative to the population and their mature size, which is considerably less than the larger trees.

Figure 6, using the same model that generated Figure 5, shows the air quality benefits, in dollars per tree, annually by selected species. Similar to CO₂ sequestration, the magnolia and northern red oak species show higher abilities to intercept air pollutants. The American elm, while not efficient at sequestering CO₂, is fairly proficient at intercepting air pollutants. The northern catalpa, a tree with very large leaves relative to its overall size, performs surprisingly low.

Additional Forested Benefits

Utilizing NLCD (National Land Cover Database) imagery,⁷ i-Tree Vue estimated the amount of carbon sequestered and air pollution removed by Forest Park’s forested areas, which generally comprise the Kennedy Forest in Zone 4 and the Successional Forest in Zone 10. As with the developed portion of the park, the estimate of air pollution removed includes PM₁₀, SO₂, O₃, and NO₂. Forest Park’s 93.9 acres of forested area with 73.1 acres of tree canopy cover provides a total air quality improvement value of \$21,508 by sequestering 97.9 tons of CO₂ and 2.5 tons of air pollution.

Table 1 compares the annual air quality benefits provided by the tree canopy in the developed portions of Forest Park with the tree canopy in the forested areas. These forested areas, covering approximately half (45.3 percent) the area of the tree canopy in the developed portions of the park, provide approximately 50 percent more benefits, or, in essence, a 1:1 ratio between the tree canopy coverage and the benefit. The trees in the forested areas did not provide greater benefits just because they were in a forest.

Stormwater Mitigation Benefits

Trees are mini-reservoirs, controlling runoff at the

Figure 6. Air quality benefits (\$\$) per tree annually by species.

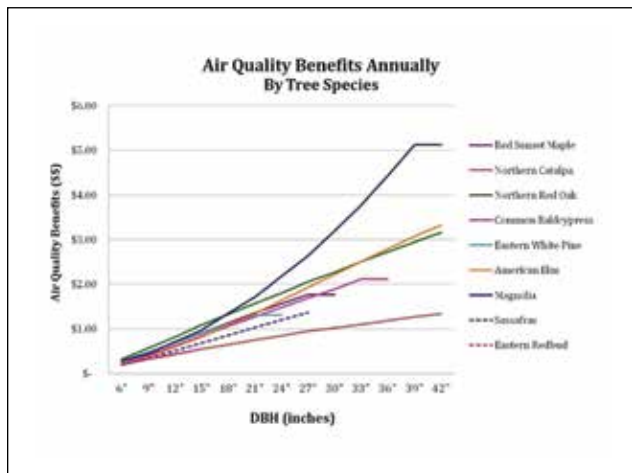


Table 1. Comparison of annual air quality benefits provided by the tree canopy in the developed portions of Forest Park and the forested areas.

Benefit	Developed Tree Canopy (161.2 acres)		Forest Tree Canopy (73.1 acres)	
	Quantity Removed (Tons)	Benefit Value	Quantity Removed (Tons)	Benefit Value
PM ₁₀	1.8	\$11,086	0.8	\$5,028
SO ₂	0.5	\$1,038	0.2	\$471
O ₃	2.7	\$23,972	1.2	\$16,875
NO ₂	0.8	\$6,854	0.3	\$3,110
CO ₂ Sequestered	215.8	\$4,463	97.9	\$2,025
Total	221.6	\$47,413	100.4	\$21,508

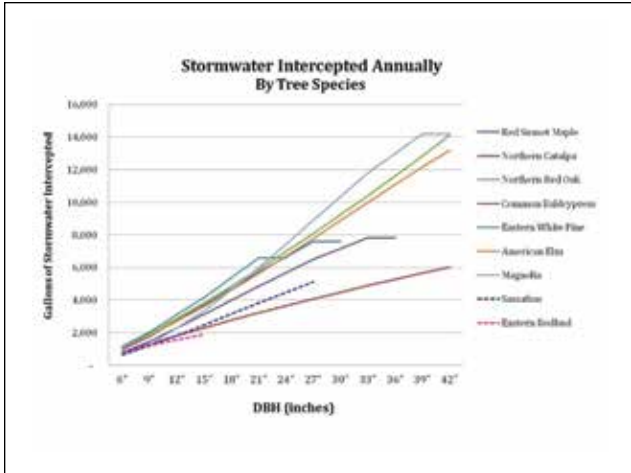


Figure 7. Gallons of stormwater intercepted per tree annually, by species.

source of the stormwater. They can reduce the amount of runoff and pollutants in stormwater in three primary ways:

1. Leaves and branch surfaces intercept and store rainfall, thereby reducing runoff volumes and delaying the onset of peak flows.
2. Root growth and decomposition increase the capacity and rate of soil infiltration by rainfall and reduce overland flow.
3. Tree canopies reduce soil erosion and surface runoff by diminishing the impact of raindrops on barren surfaces, essentially, slowing them down.

Forest Park’s landscape trees intercept 34,691,887 gallons of stormwater annually, or 2,296 gallons per tree, on average. The total value of this benefit to the park is \$215,105, with an average value of \$14.23 per tree. Mature, large-growing trees intercept larger volumes of water and produce greater benefits compared to mature, small-growing trees.

Figure 7 shows the number of gallons of stormwater intercepted per tree annually by selected species. The magnolia and northern red oak species again perform well, exhibiting a remarkable ability to intercept stormwater. The Eastern white pine, while demonstrating a lower capacity to sequester CO₂ and cleanse the air of pollutants, is able to intercept a high volume of stormwater.

Net Benefit and Benefit-Cost Ratio

The sum of environmental and economic benefits provided to Forest Park by its landscaped trees is

Table 2. Forest Park’s Net Benefit and Benefit-Cost Ratio.

	Total (\$)	\$/Tree	\$/Visitor
Total Annual Benefits	\$1,211,496	\$80.17	\$0.10
Total Annual Costs	\$287,504	\$19.03	\$0.02
Net Annual Benefits	\$923,992	\$61.15	\$0.08
Benefit-Cost Ratio		\$4.21	

\$1,211,496 annually, at an average of \$80 per tree. When Forest Park’s annual tree-related expenditures of \$287,504 are considered, the net annual benefit (benefits minus costs) returned by landscape trees is \$923,992.

Applying a cost-benefit ratio (CBR) is an effective way to evaluate the park’s investment in trees. A CBR is an indicator used to summarize the overall value compared to the costs. Specifically in this analysis, CBR is the ratio of the cumulative benefits provided by the park’s landscape trees, expressed in monetary terms, compared to the costs associated with their management, also expressed in monetary terms. Based on the inventory count of 15,111 landscape trees (in 2006), Forest Park receives \$4.21 in benefits for every \$1 that is spent on its municipal forestry program. Table 2 provides a complete breakdown of the numbers.

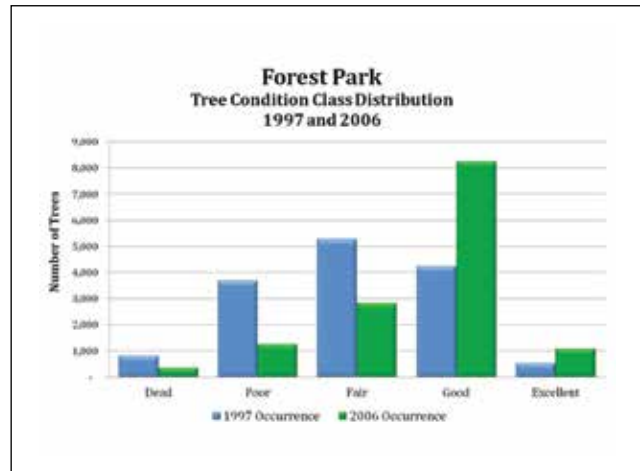
Tree Condition

Keeping the trees in Forest Park in excellent or good condition is crucial for maintaining the environmental and economic benefits they provide. Table 3 and Figure 8 show the evolution of the condition of the trees from 1997 to 2006.⁸ The overall condition of the trees in Forest Park improved dramatically between these years. Due to increased – and better – management of the park’s trees, a significant decrease occurred in the “dead,” “poor,” and “fair” categories (a 57 percent decrease, a 66 percent

Table 3. The condition of Forest Park’s trees in 1997 and 2006.

Condition Class	1997 Occurrence	1997 % of Population	2006 Occurrence	2006 % of Population	Change	% Change
Dead	796	6%	342	2%	-454	-57%
Poor	3,664	25%	1,245	9%	-2,419	-66%
Fair	5,263	36%	2,818	21%	-2,445	-46%
Good	4,223	29%	8,246	60%	4,023	95%
Excellent	522	4%	1,089	8%	558	107%

Figure 8. Condition of Forest Park’s trees in 1997 and 2006.



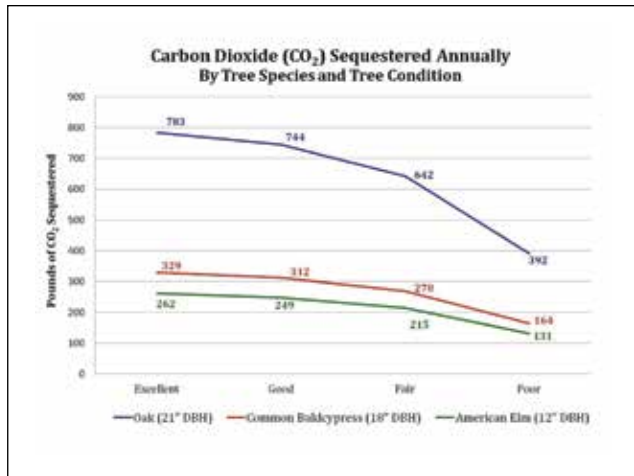


Figure 9. Carbon dioxide (CO₂) sequestration by selected tree species annually by condition.

decrease and a 46 percent decrease, respectively); while an increase occurred in the “good” and “excellent” categories (a 95 percent increase and a 107 percent increase, respectively). This shift occurred as dead trees were removed and those in poor and fair condition improved. This change also accounts for the increased number of young trees that are generally considered to be in good or excellent condition.

According to SKA Forestry Consultants in 2006, the number of trees fell by 737 (a 5 percent decrease) as many of the poor quality (and potentially hazardous) trees were removed.

Pruning efforts have increased the overall health and condition ratings of remaining trees. As a result, the overall maintenance needs of trees in Forest Park fell 42 percent between 1997 and 2006, most significantly in the maintenance needs typically associated with larger trees, such as hazard tree removal, hazard limb pruning, and crown cleaning.

Figures 9, 10, and 11 demonstrate the importance of maintaining a healthy tree population in order to maximize the environmental and economic benefits associated with those trees. Figure 9 shows the amount (in pounds) of CO₂ that can be sequestered by three tree species: oak (any species), common bald cypress, and American elm, at different levels of maturity. A 21” DBH oak tree in excellent condition is able to sequester 783 pounds of CO₂ annually. This is a significant number as Figure 5 shows that oak is one of the most efficient tree species in sequestering CO₂. For the same tree in good condition the sequestration level drops only 5% to 744 pounds. If the condition slips to fair, the sequestration potential drops to 642 pounds, an 18% decrease. The same tree, in poor condition, however, can sequester only 392 pounds of CO₂ annually, a 50% decrease from the original 783 pounds expected from a tree in excellent condition.

The 18-inch DBH common bald cypress and 12-inch DBH American elm show similar rates of decline in the ability to sequester CO₂ as the tree’s condition deteriorates,

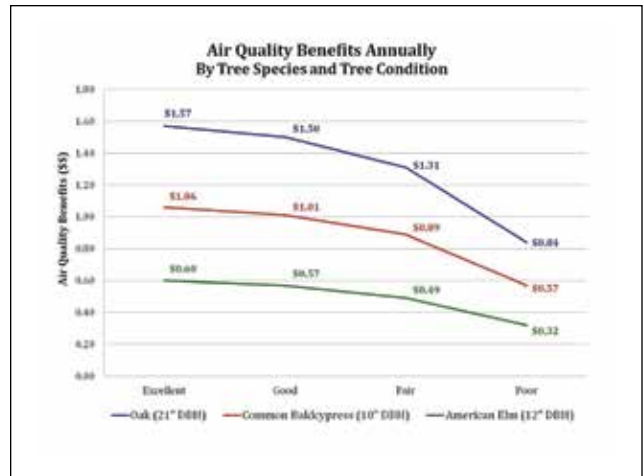


Figure 10. Air Quality benefits in dollars by selected tree species annually by condition

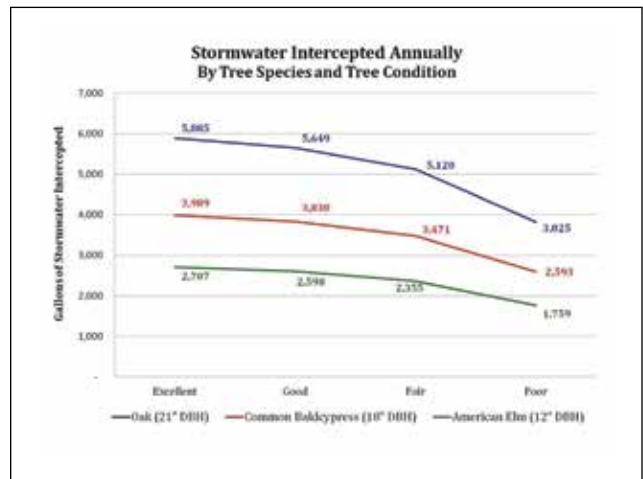


Figure 11. Gallons of stormwater intercepted by selected tree species annually by condition

although the regression is not as pronounced, perhaps due to the efficiency of the trees in sequestering CO₂, (i.e., less than that of the oak) and the smaller diameter of the trees, again, less than the larger 21-inch DBH oak. In both cases, though, a tree in poor condition is able to sequester only half the CO₂ as the same tree in excellent condition.

Figure 10 shows a similar scenario for maintaining the benefits from increased air quality. For the same three trees (21-inch DBH oak, 18-inch DBH common baldcypress and 12-inch DBH American elm), the benefits associated with air quality – the absorption of ozone (O₃), sulfur dioxide (SO₂), and nitrogen dioxide (NO₂) through the leaf surfaces and the interception of particulate matter (PM₁₀) – decrease by approximately 50 percent when the same tree goes from excellent to poor condition. Comparable decreases in benefits are also evident for trees in good and fair condition.

Lastly, Figure 11 shows how stormwater interception is affected by the health of the tree. In this graphic, the

same three trees as used in Figures 9 and 10 are used to demonstrate how much less stormwater is intercepted as the tree's condition deteriorates.

The decline, while still pronounced, is not as severe as declines shown in the two previous graphs.

For all three trees (21-inch DBH oak, 18-inch DBH common bald cypress, and 12-inch DBH American elm) there is only a decline of approximately 5 percent in the ability to intercept stormwater when the tree goes from excellent to good condition and a decrease of 13 percent when the tree slips to fair condition (19 percent for the 21-inch DBH oak). When the condition goes from excellent to poor, the ability of all three trees to intercept stormwater decreases by 35 percent. While still a significant decrease, the decline is not as severe as the 50 percent reduction found for the same trees when considering CO₂ sequestration and air quality benefits.

Figures 9, 10, and 11 stress the importance of maintaining a healthy tree population in Forest Park. These three graphs show a strong correlation between the condition of the trees and the environmental and economic benefits they provide. In addition to the loss of aesthetic benefits, if the condition of the trees declines, there will be an associated decline in benefits.

Tree Size/Age Distribution

Maintaining a healthy population of trees in Forest Park includes maintaining an appropriate size, or age, distribution. The distribution of ages within a tree population influences present and future costs as well as the flow of benefits. An ideal tree population has a higher percentage of young trees (40 percent) than established (30 percent), maturing (20 percent), and mature trees (10 percent) in order to minimize fluctuations in benefits. The age structure of Forest Park's landscape trees is considered ideal at a distribution of 51:12:24:13 (percentages of young: established: maturing: mature trees). However, the age distributions among individual tree management zones are not ideal.

As shown in Table 3 and Figure 12, while the total trees numbers fell from 14,468 to 13,731 (a reduction of 737 trees, or 5 percent), trees within the 0- to 6-inch diameter class (DBH) increased 67 percent, due to aggressive planting efforts. Trees within the 7- to 12-inch diameter

Table 4. A comparison of the size/age distribution of trees in Forest Park, 1997 and 2006.

Diameter Class (DBH)	Number of Trees in 1997	Number of Trees in 2006	Change	% Change
0 - 6"	3,482	5,831	+2,349	+67%
7 - 12"	4,427	1,892	-2,535	-57%
12 - 18"	2,981	2,150	-831	-28%
19 - 24"	1,963	1,757	-206	-10%
> 24"	1,615	2,101	+486	+30%
Total	14,468	13,731	-737	-5%

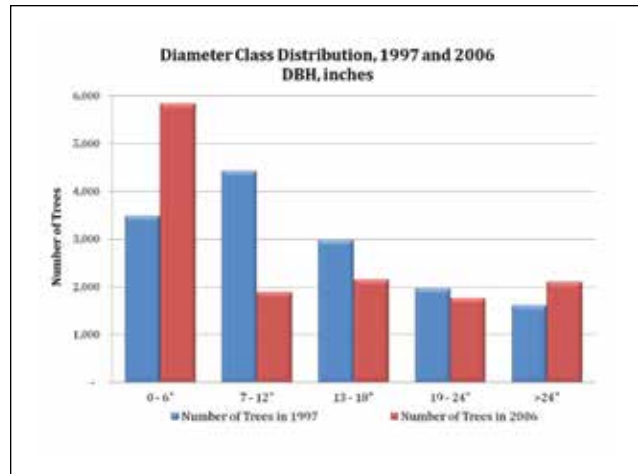


Figure 12. A comparison of the size/age distribution of trees in Forest Park, 1997 and 2006

class, though, fell by 57 percent. Many newly planted trees do not survive to reach the 7- to 12-inch diameter class, possibly due to drought or mower and weed trimmer damage. The number of trees in the larger diameter classes (13- to 18-inch and 19- to 24-inch) fell as well, except for the >24-inch class which increased by 30 percent. I could not find a reason for the decline in the 13- to 18-inch DBH and the 19- to 24-inch DBH categories, other than possibly because of the removal of some of these trees that were dead or dying. Some tree species reach their maturity at these sizes and need to be removed when necessary. It is expected that higher survival rates of smaller trees, as part of a healthier tree population, will eventually increase the number of larger trees and will create a more sustainable population, while contributing more environmental and economic benefits.

Figure 13 illustrates the relative age distribution among Forest Park's 14 tree management zones. Zones 1 through 3, 5 through 9, 12, and 14 are approaching the ideal age distribution. These ten zones have larger amounts of young trees compared to established, immature, and maturing trees in their populations. Zones 4 and 10 have relatively even-aged populations that are not ideal. Zone 4's population is 28.3 percent young, 16.5 percent established, 31.0 percent maturing, and 24.2 percent mature. Zone 10's population is 31.1 percent young, 15.8 percent established, 29.0 percent maturing, and 24.0 percent mature. Zones 11 and 13 have large amounts of mature trees (37.5 percent and 37.3 percent, respectively) compared to young trees (21.9 percent and 22.7 percent, respectively). The latter two zones are likely to see large fluctuations in costs and benefits due to the high presence of mature trees and lower presence of young trees.

Among species populations, American sycamore (63.9 percent), pin oak (67.6 percent), and Austrian pine (63.9 percent) dominate their immature (maturing) and mature size classes and have a lower representation in their young size class (12.9 percent, 21.8 percent, and 13.8 percent, respectively). The lack of younger trees for these three

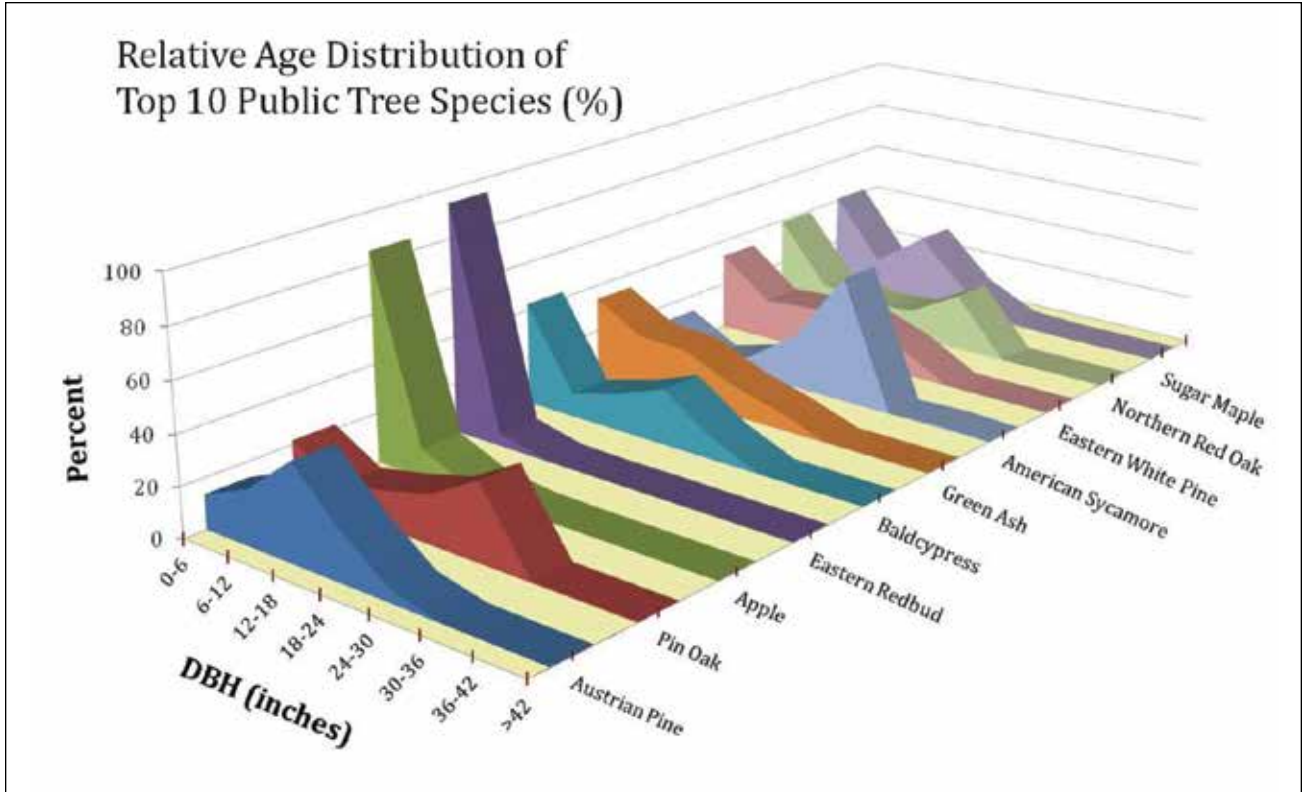
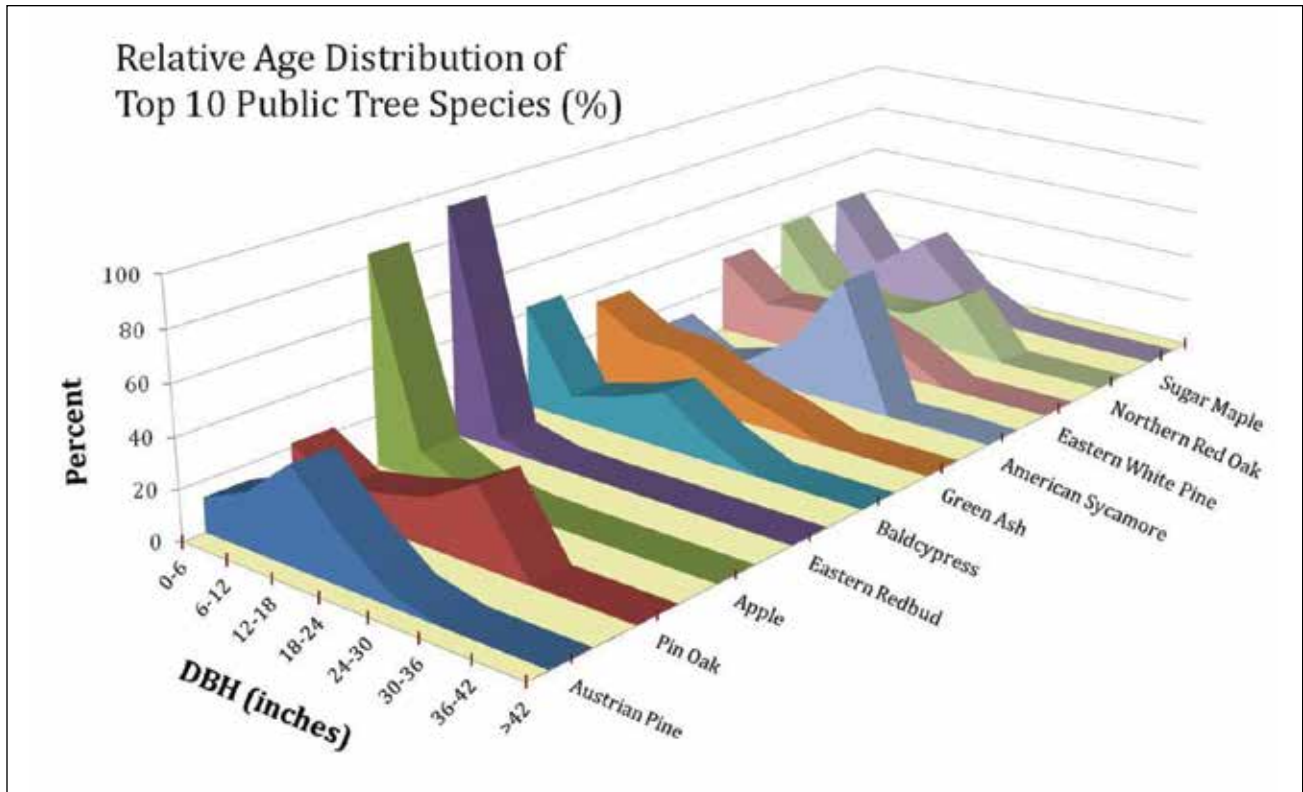


Figure 13. The relative age distribution of Forest Park trees by zone.

Figure 14. Relative age distribution of the top ten public tree species.



species stands out in Figure 14, showing the relative age distribution for the top ten public tree species in the park. While widely used in the past, the City and Forest Park Forever are actively working to minimize these individual populations as these three are now recognized as inferior species. The American sycamore compartmentalizes decay poorly, is prone to fungus infestation, and is a “messy” tree, due to its large leaf and heavy fruit production. The Pin oak has a poor survival rate in higher soil pH levels, and the Austrian pine has a poor survival rate due to issues caused by diplodia tip blight, zimmerman pine moth, and pitch mass borer.

These trees are being restricted to specific areas of the park better suited to the needs of each species. However, as noted earlier, these three species alone provide 23.7 percent (\$2,023) of the total annual air quality benefits in the park and are currently the three tree species with the highest Importance Value. Without sufficient replacement species, the current functional capacity of these large-growing, high-benefit producing trees will diminish. This is an instance where the information provided in by the i-Tree Design program and graphically illustrated in Figures 5, 6, 7, 8, 9, 10, and 11 would be useful in determining appropriate replacement species.

As also illustrated in Figure 14, baldcypress (42.6 percent), sugar maple (41.1 percent), northern red oak (39.2 percent), eastern white pine (33.1 percent), and green ash (34.1 percent) have dominate amounts of trees in their young size classes and lower representations of trees in their immature and mature size classes. These large-growing species are beginning to approach an ideal distribution and will provide increasing benefits as they mature.

It is also important to consider small-growing trees in the species matrix. As shown in Figure 14, apple and eastern redbud have uneven-age distributions heavily skewed towards young trees. Of the 691 apple trees in the park, 85.0 percent are young trees, 11.6 percent are established trees, and 3.4 percent are maturing to mature trees. It is important to realize that small-growing trees mature much earlier than large-growing ones, and for this reason need a strong and more populated base of young trees to continue the canopy cover associated with these species.

Based on these results, Forest Park only lacks appropriate age distributions for three of the ten most populated species, American sycamore, pin oak, and Austrian pine.

Tree Biodiversity

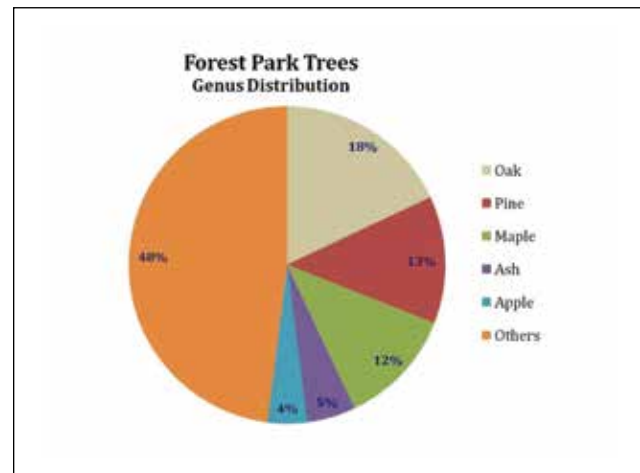
Ideally, no single species should make up more than 10 percent of a park’s tree population. This distribution ensures a diverse population; maximizes the environmental, economic, and aesthetic benefits; and minimizes the chance of catastrophic losses from insects or diseases. There are no species in the park that exceed this 10 percent level. SKA Forestry Consultants suggest that no genus exceed 25 percent of a park’s tree population, although the consultants at Davey Resource Group who

wrote the Forest Park i-Tree Analysis recommend no more than 20 percent for one genus. As indicated in Figure 15 showing the top five genera represented in the park, there are none that exceed either one of these levels. The oak genus (*Quercus*) comprises 18 percent of the park’s trees while the pine genus (*Pinus*) encompasses 15 percent. The maple genus (*Acer*) makes up 12 percent of the population, ash (*Fraxinus*) 5 percent, and the apple genus (*Malus*) a mere 4 percent. Forest Park has a diverse tree population, with 48 percent of the trees coming from genera other than these top five. Forest Park’s tree population includes a mix of 222 species from 77 genera.

The biodiversity of the park’s trees has increased dramatically since 1997. In 1997 there were 120 species found in the park’s landscaped trees. By 2006, increased plantings pushed that number to 189 species. In 2010, there were 222 tree species found in the park, an increase of 46 percent between 1997 and 2010. This nearly two-fold increase, together with the appropriate age distribution of the trees noted above, is expected to provide greater environmental, economic and aesthetic benefits in the future.

Figure 16 emphasizes the importance of tree species biodiversity and its relation to providing habitat for and attracting wildlife. This graph, derived from Douglas Tallamy and Kimberley Shropshire’s research,⁹ shows the number of species in the listed genera that are host trees for species of Lepidoptera – butterfly and moth larvae – which are in turn important pollinators and food for birds and other animals. Dr. Tallamy, from the University of Delaware, has written extensively on the role of native plants in the ecosystem. Kimberley Shropshire is one of Dr. Tallamy’s students who, with his help, took on the enormous task of compiling this list of Lepidoptera species. As an advocate of native plants in Missouri, Ann Wakeman¹⁰ points out that lepidopteran larvae (caterpillars) are extremely valuable sources of food for many terrestrial birds, particularly warblers and neotropical migrants. Tallamy and Shropshire’s work categorizes native and alien plant genera in terms of their

Figure 15. Genus distribution of the trees in Forest Park.



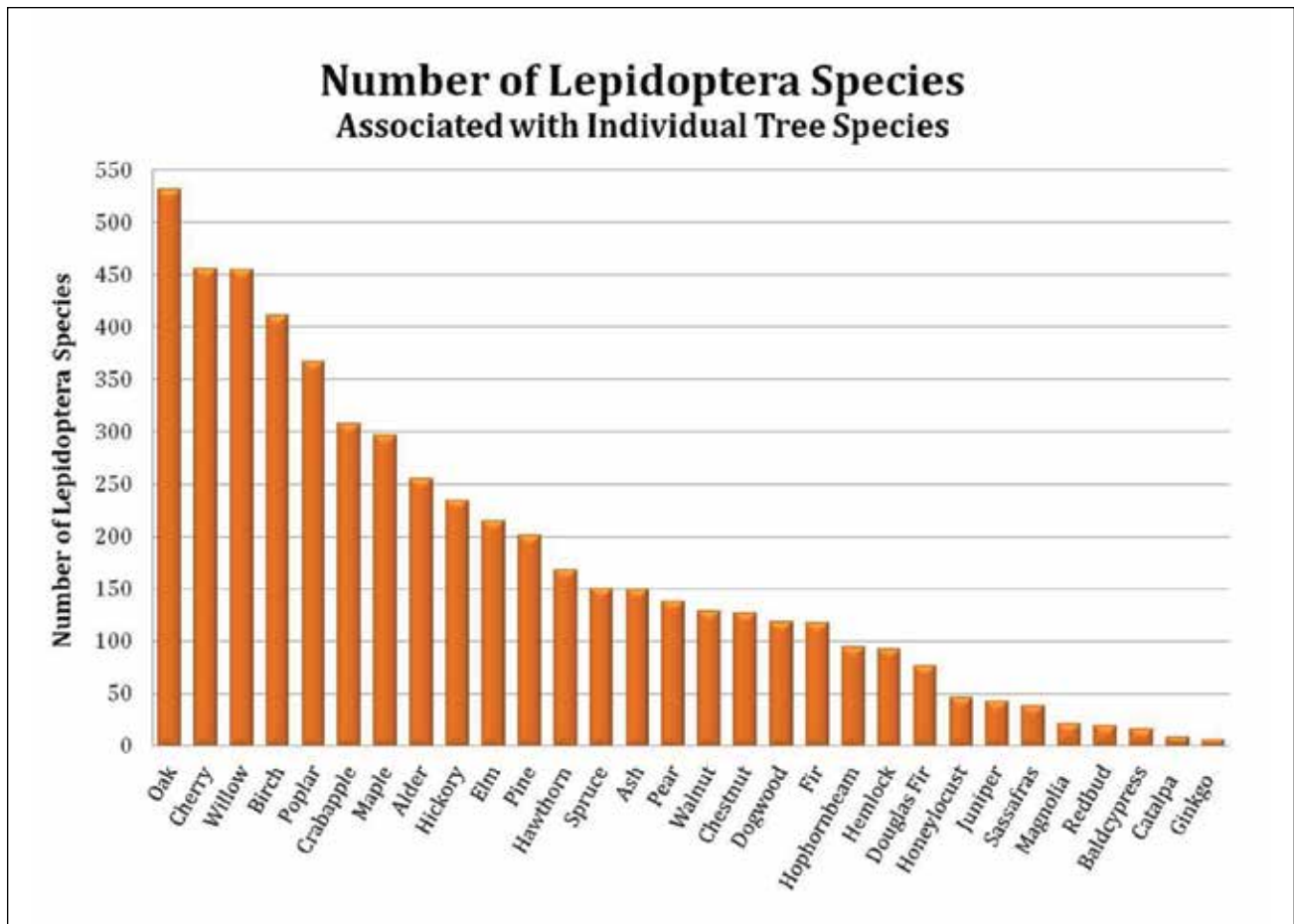


Figure 16. Tree species by genera that are host to Lepidoptera species.

ability to support insect herbivores and, by inference, overall biodiversity. They ranked all native plant genera by the number of Lepidoptera species (butterflies and moths) recorded using them as host plants. While their study focused on the Mid-Atlantic region of the United States, I believe the theory behind their analysis is valid for Forest Park. All but two of these genera, willow and poplar, are on the Suggested Planting list provided by Davey Resource Group as part of their Forest Park i-Tree Analysis, and species in all of these genera are currently found in Forest Park. Ensuring that tree species in these genera and others are kept healthy would support and attract an increasing diversity of wildlife to the park.

The ecological performance of the park has increased since the Forest Park Master Plan was approved in 1995, and subsequently implemented. The Forest Park i-Tree Report from 2011 and the online i-Tree Design tools document how much we are benefitting from the trees in Forest Park. When comparing this to the health and diversity of the trees in 1997, my research shows that the trees prior to restoration of the park could not have provided the same level of benefits in 1997. As the City and Forest Park Forever have continued their care of the

tree stock within the park, and as trees have continued to mature, the environmental and economic benefits today are likely greater than they were in 2006 and are substantially greater than 1997.

The trees in Forest Park also are providing ecosystem services that, on a more global scale, reduce the air pollution associated with the formation of greenhouse gases that are attributable to climate change, such as carbon dioxide (CO₂) and ozone (O₃), in addition to other pollutants like sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and small particulate matter in the air (PM₁₀).

The primary concern from a tree management perspective is that the three tree species in the park with the highest importance value – pin oak, American Sycamore, and Austrian pine – are now recognized as inferior tree species. Even though they were widely used in the past, the City and Forest Park Forever, with an emphasis on maximizing the benefits derived from the park’s trees, are actively working to minimize these individual populations. American sycamore compartmentalizes decay poorly, is prone to fungus infestation, and is a “messy” tree, due to its large leaf and heavy fruit production. Pin oak has a poor survival rate

in higher soil pH levels, and the Austrian pine has a poor survival rate due to issues caused by diplodia tip blight, zimmerman pine moth, and pitch mass borer. These trees are being restricted to specific areas of the park better suited to the needs of each species. Skillful planning will be needed to make sure the functional capacity of these trees is suitably replaced without diminishing the benefits they provide.

ENDNOTES

- ¹ Annual benefits for Forest Park's landscape trees were estimated for the fiscal year 2010 using i-Tree's Streets (v4.0) and utilizing data from park's 2006 tree inventory.
- ² Data used for this analysis were obtained from the Forest Park Year 2006 tree inventory, containing 15,111 landscape trees.
- ³ Caroline Loughlin, *Forest Park* (St. Louis: The Junior League of St. Louis and University of Missouri Press, 1986).
- ⁴ J. Dwyer, H.W. Schroeder, and P.H. Gobster, "The Ecological City: The Deep Significance of Urban Trees," in *In The Ecological City: Preserving and Restoring Urban Biodiversity*, edited by R.H. Platt, R.A. Rowntree, and P.C. Muick (Amherst: The University of Massachusetts Press, 1994), 137-50.
- ⁵ This data was obtained using the i-Tree design program, found at <http://www.itreetools.org/design.php>.
- ⁶ In 1987, EPA replaced the earlier Total Suspended Particulate (TSP) air quality standard with a PM-10 standard. The new standard focuses on smaller particles that are likely responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract. The PM-10 standard includes particles with a diameter of 10 micrometers or less (0.0004 inches or one-seventh the width of a human hair).
- ⁷ NLCD is an abbreviation for National Land Cover Database. The model uses satellite-based imagery to assess land cover, including tree canopy. This is a different model than was used to assess the developed portion of the park. It should be noted that NLCD tends to underestimate tree canopy cover by 10% due to the quality of resolution in Landsat satellite images.
- ⁸ The number of trees in the 2006 inventory used by SKA Forestry Consultants, 13,731, is 1,380 trees less than the 15,111 landscape trees used for the i-Tree analysis.
- ⁹ D.W. Tallamy and K.J. Shropshire, "Ranking Lepidopteran Use of Native Versus Introduced Plants," *Conservation Biology* 23 (2008): 941-47.
- ¹⁰ A. Wakeman, "Prairie gardening with Propagated Plants," *Missouri Prairie Journal* 30 (2009): 6-13.

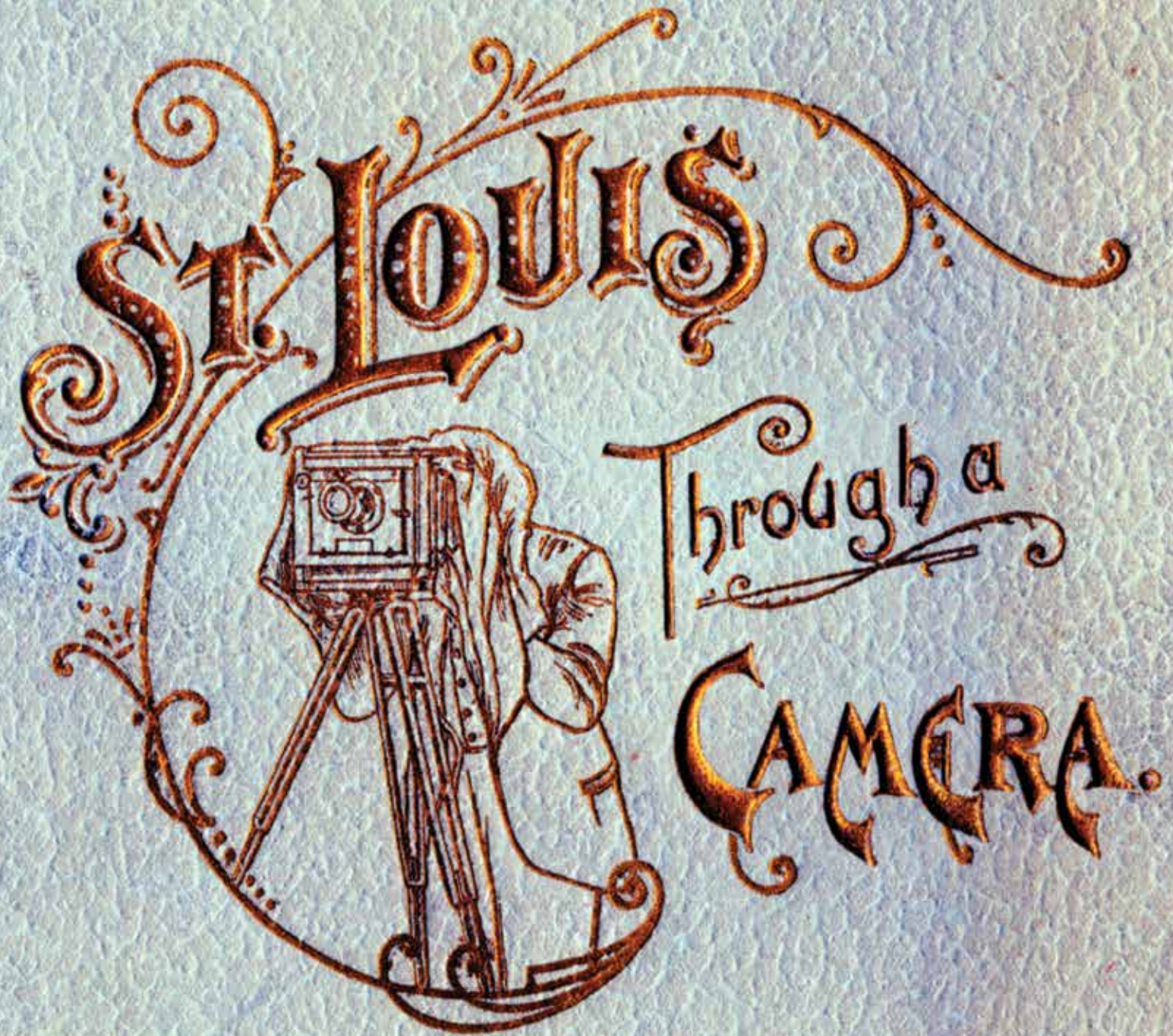


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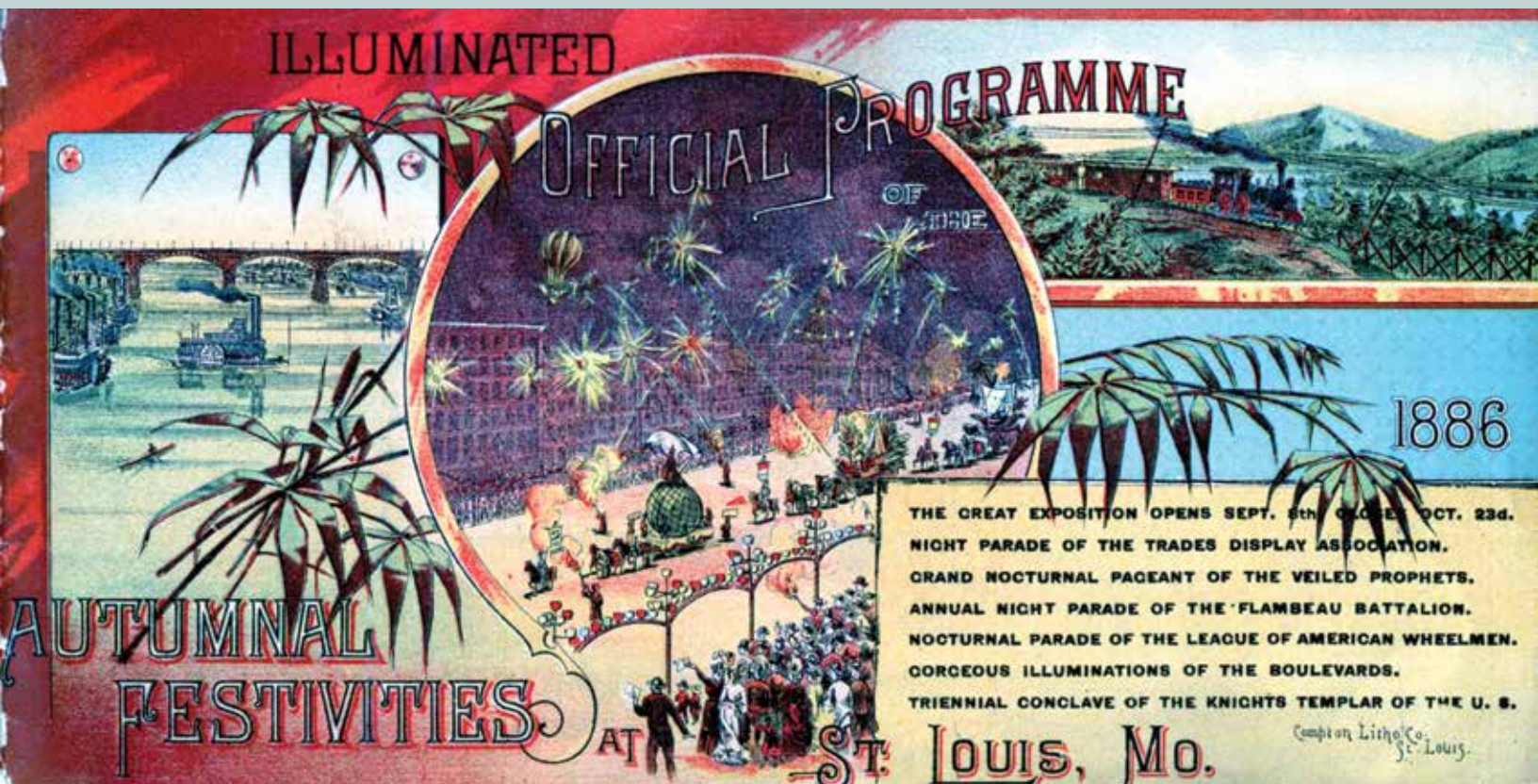
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The title 'ST LOUIS' is rendered in a highly ornate, blackletter-style font. The letter 'L' is particularly large and features a detailed illustration of a person in a long coat and hat, standing behind a camera mounted on a tripod. The camera is a boxy, vintage-style model with a lens and various adjustment knobs. The person's hands are positioned as if they are adjusting the camera. The entire title is set against a background of intricate, swirling flourishes that extend from the letters.

BY MIRANDA RECHTENWALD

In 1892, the St. Louis Autumnal Festivities Association published *St. Louis Through a Camera*, “designed as an introduction to modern St. Louis.” Through this slim volume, the introduction explains, “the reader can see in the engravings, made from photographs, how we live; he can see the kind of buildings in which we do business; our recreation and pleasure grounds, and he may form some sort of an opinion of the people of the most hospitable city in the country. He may be induced to pay us a visit — say during our forty days’ fall festivities — and see more of the not ‘future,’ but present, great city of the West.”



St. Louis Through the Camera, published by the Bureau of Information of the St. Louis Autumnal Festivities Association, boasted, “It is safe to say, that no city of the world has made greater strides in municipal improvement than St. Louis. ... This little brochure is designed as an introduction to modern St. Louis, and is presented by its citizens.” (Image: Washington University Library Special Collections)

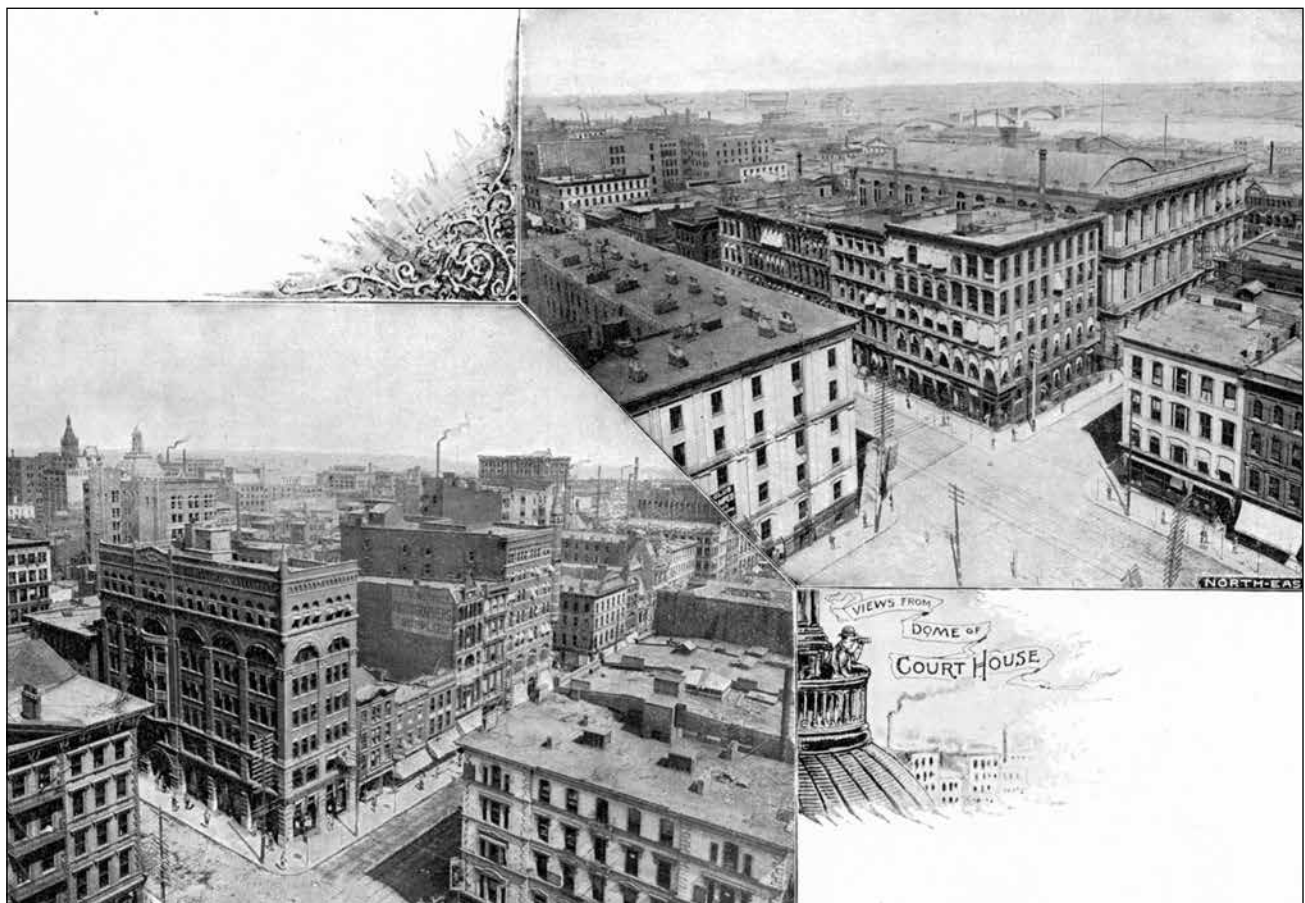
Determined not to lose business and customers to Chicago's World's Fair of 1892-93 (a competition St. Louis bitterly lost), the Autumnal Festivities Association heavily marketed St. Louis' finest points. The authors boasted, "*St. Louis Through a Camera* ... does not contain a line of advertising, nor has any consideration actuated the compilers other than a desire to present to the world the city as it is. In order to confine the work to convenient size for mailing, it has been necessary to limit both the number of illustrations and the amount of space devoted to explanatory reading matter, and hence only the most striking features of St. Louis, its greatness, and its elegance, have been described and illustrated." Of course, while it did not contain any outside advertisements, the booklet's chief goal to advertise the city and her glory is a less than subtle message woven through each page.

St. Louisans were long accustomed to planning and attending grand fairs and expositions. The first St. Louis Agricultural and Mechanical Fair, organized in

1856, included popular livestock and farm product competitions, parades, refreshment booths, and art displays. These events were held at Fairgrounds Park, just north of downtown, nearly every year. Even during the Civil War, St. Louis held fairs. The 1864 "Grand Mississippi Valley Sanitary Fair" provided not only entertainment and distraction, but also raised funds for the Western Sanitary Commission's aid to war refugees and wounded soldiers. The annual parade and ball from the secret Veiled Prophet Association, organized by St. Louis elite in 1878, was soon expanded into a longer "festival season." In 1886 a small pamphlet enticed potential visitors with vividly colored images of the parades, floats, and shows they could expect to view during their visit – including elaborate illuminated night exhibits.

The following is a selection of images from *St. Louis Through the Camera* with excerpts from this chapter on St. Louis boosterism.

One mark of progress was this series of panoramic views showing a complete 360-degree view from the top of the Old Courthouse (bound by Broadway, Chestnut, Fourth, and Market streets in downtown St. Louis). This would have been a rare view for most people, since the dome of the Courthouse remained one of the tallest structures in the city at the time. (Image: *Washington University Library Special Collections*)



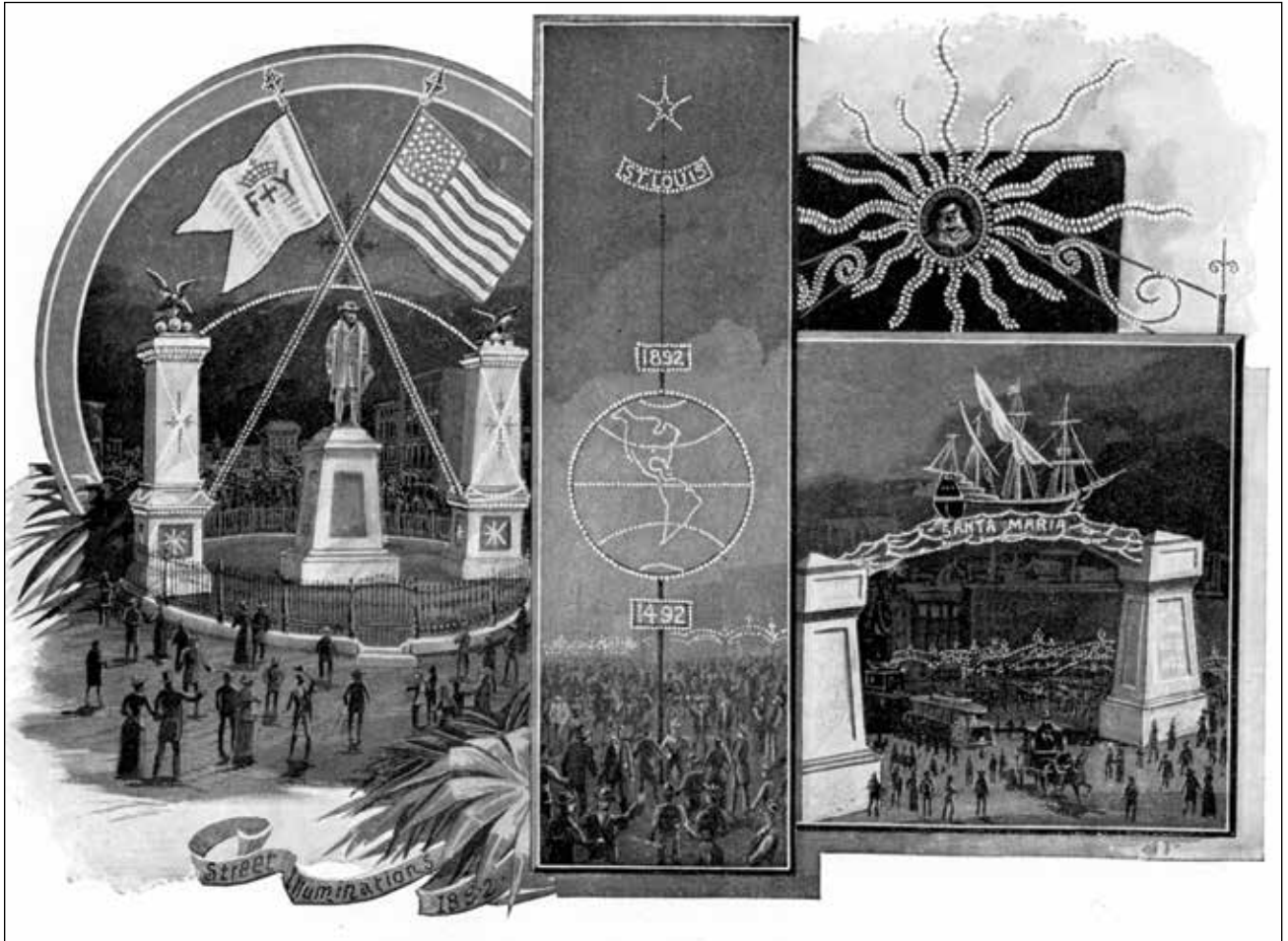


The parade route in 1886 passed the Post Office (now the Old Post Office, bound by Olive, Locust, Eighth, and Ninth streets) in downtown St. Louis, which is visible in the background of the "St. Louis Flambeau Battalion" of the Knights Templar. (Images: Washington University Library Special Collections)



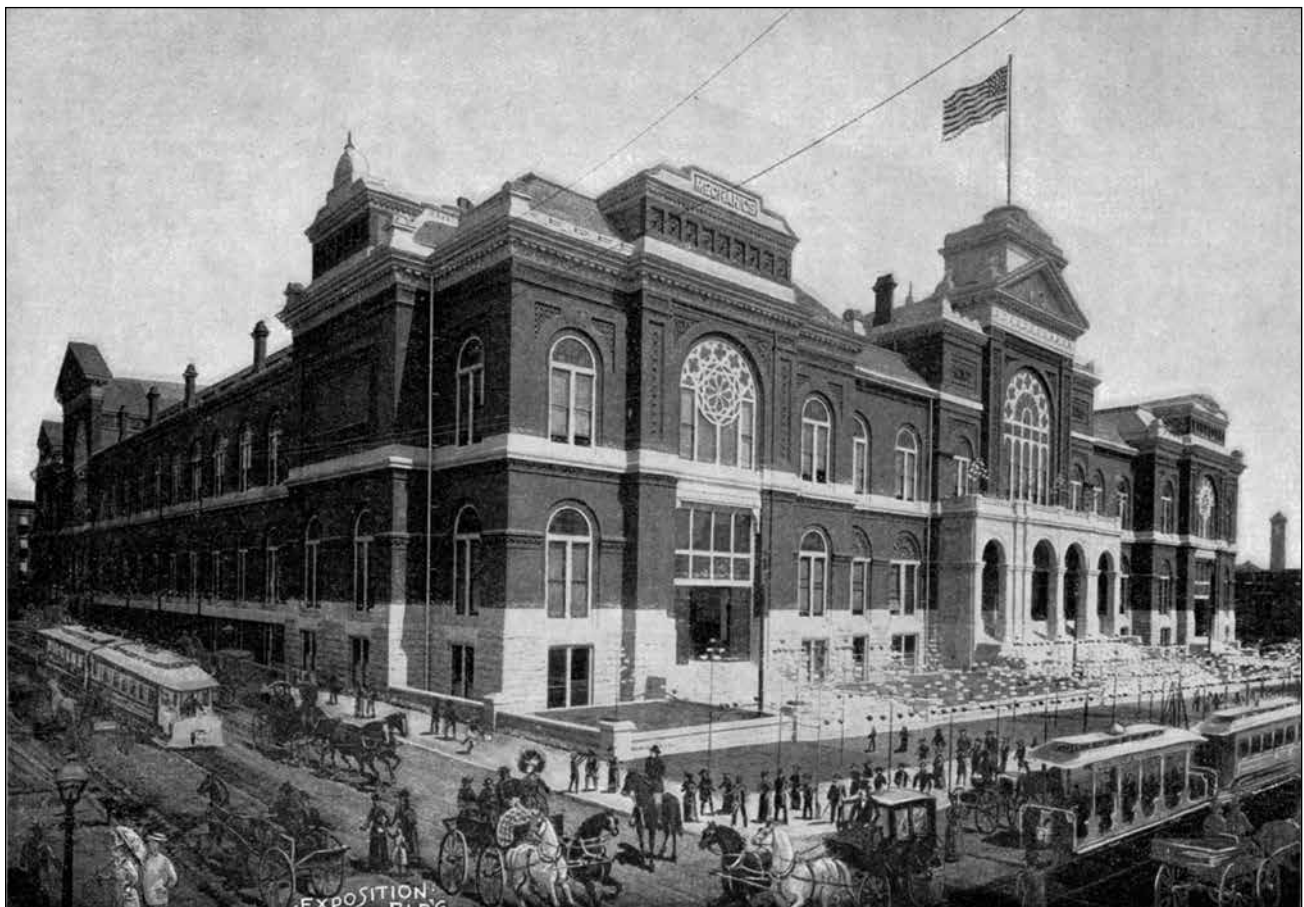


St. Louis may have lost to Chicago its bid to host the Columbian Exposition commemorating the 400th anniversary of Columbus' voyage, but it wasn't going to be completely outdone, as these scenes from the parade show. (Images: Washington University Library Special Collections)





"It is true," said *St. Louis Through the Camera*, that the city's attractions "have earned for St. Louis the title of 'The Carnival City of America'; but at the same time, its work does not end with attracting visitors to the city, and entertaining them while they are in it. Its more important object is to direct the energies of the people into the right channel, and to speed the day on which St. Louis will be acknowledged as the greatest city in America, west of New York." (Images: Washington University Library Special Collections)



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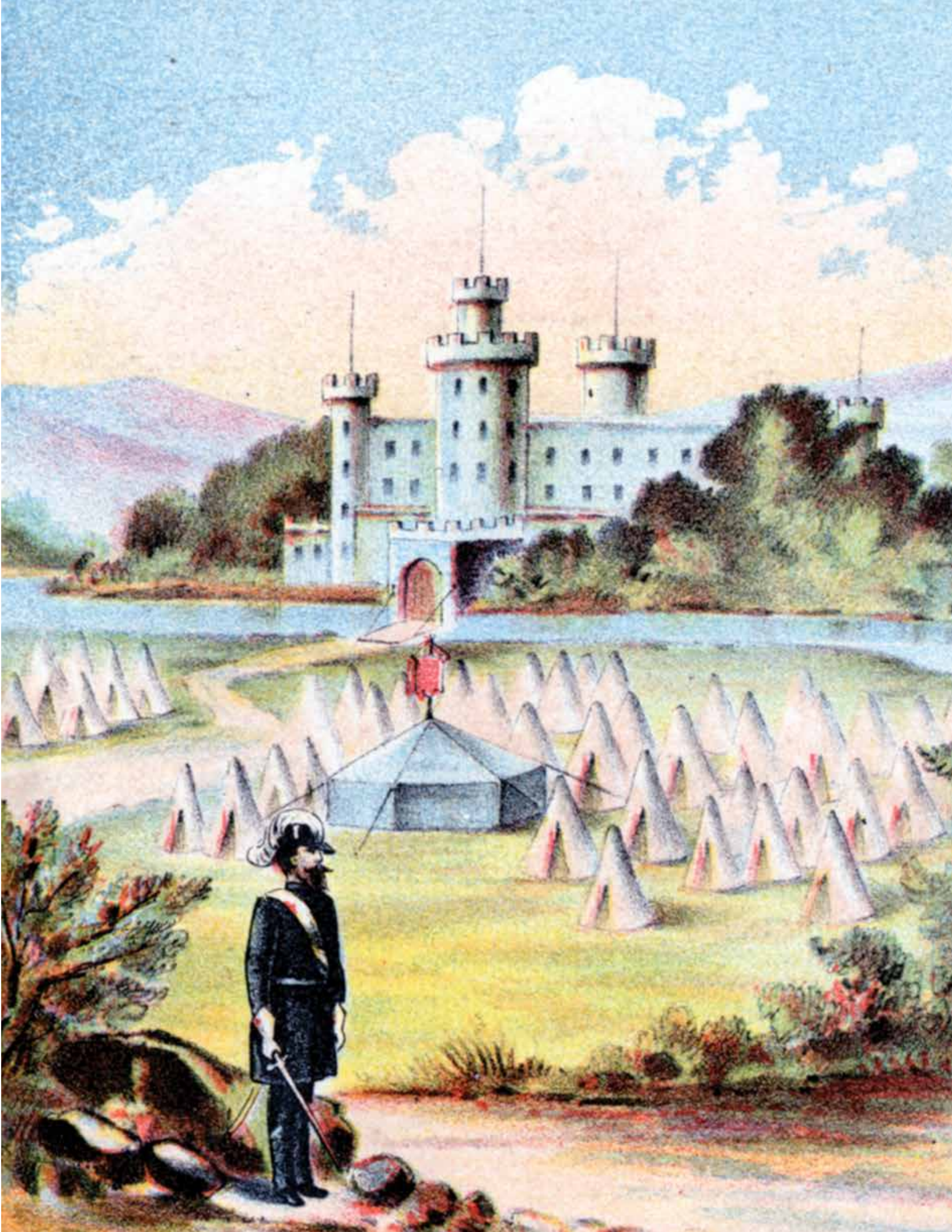
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