

HISTORY OF CINCINNATI'S WOODED HILLSIDES

The Ohio River forms the 22-mile-long southern boundary of Cincinnati. The river valley wall rising up from the city's shoreline is interrupted by the mouths of tributary valleys, the largest of which are those of the Mill Creek and the Little Miami River. Downtown Cincinnati and other city neighborhoods share the basin at the mouth of the Mill Creek Valley while Lunken Airport covers the level bottomland at the mouth of the Little Miami Valley. Within the borders of the 78-square-mile city, the sides of the Mill Creek and Little Miami Valleys are incised by mouths of branch valleys while the slopes along the branch valleys are notched by ravines.

The extensive dissection of Cincinnati's landscape has created gradients of twenty percent or more over almost a fifth of the city's surface. The uneven terrain is indicated by the names of several Cincinnati neighborhoods: Bond Hill, Clifton (derived from the Old English *clif* and *tun*, meaning "hillside settlement"), College Hill, CUF (acronym for the adjacent Clifton Heights, University Heights, and Fairview communities), Fairmount, Kennedy Heights, Mount Adams, Mount Airy, Mount Auburn, Mount Lookout, Mount Washington, Paddock Hills, Pleasant Ridge, Price Hill, Roll Hill, Tusculum (named after a wealthy Roman hill community), Walnut Hills, and Winton Hills.

Cincinnati is one of the nation's hilliest large cities, a group that includes San Francisco, Seattle, and Pittsburgh. Like these and many other U.S. municipalities, Cincinnati has conserved some of its hillsides as open spaces for recreation and wildlife. On the other hand, human disturbances of Cincinnati's slopes has put the city at the top of the list of per capita landslide

costs in U.S. urban areas. This history essay will chronicle how the city's hillsides have been admired for their beauty, disrupted for their resources, and protected through parkland acquisition and government oversight of hillside development and road construction.¹

Before the town's borders were expanded during the latter half of the nineteenth century, Cincinnati boosters characterized the municipality as a "City of Seven Hills," the historical title for Rome, Italy. An 1853 tabulation of the seven highlands surrounding the Cincinnati basin listed Mount Harrison (now Price Hill), Fairmont (now Fairmount), College Hill, Vine Street Hill (now Clifton Heights), Mount Auburn, Mount Adams, and Walnut Hills. The "Seven Hills" designation for Cincinnati is rarely used today, although the label survives in the names of a few local schools, businesses, and organizations. The city nevertheless remains tied to Rome since it is the namesake of the Society of Cincinnati, an American Revolutionary War veterans association with a title derived from the Roman soldier Lucius Quinctius Cincinnatus. General Arthur St. Clair, a proud member of the veterans group and the first governor of the Northwest Territory, in 1790 substituted "Cincinnati" for "Losantiville," the original name given to the settlement founded in 1788 at the site of the present-day Downtown neighborhood.²

Prior to General St. Clair's retitling of the town, pioneers had carved forest clearings in which to build cabins, erect barns, and grow crops. Very few natural forest openings existed in the Cincinnati vicinity, one being a tornado-ravaged tract where "every tree and the surface of the earth has been washed or blown off." Late-eighteenth-century logging activities provided the region's growing population with more clearings for buildings and farm fields, but the hillside woodland was left intact since raising crops on sloped ground was much harder than cultivating the bottomlands and hilltop plateaus.³

Physician Daniel Drake reported that at the start of the 1800s, the Mount Adams hillside overlooking Cincinnati remained a “deep wood” in which grew “the red-bud, crab apple, and gigantic tulip-tree, or yellow-poplar, with wild birds above, and native flowers below.” Drake also related that one of his clients complained of a woodland witch who lived on the forested slope below East Walnut Hills. A biography of Drake included an account of his 1818 move to the lower Mount Auburn hillside that “was then covered with woods.” Drake lived there in a cabin that, “although only a fifteen minutes ride from his office in town, could not, for the exuberant foliage, be seen from any point in the plain below.”⁴

Frances Trollope, a British author who chronicled her 1828-29 Cincinnati residency in the book *Domestic Manners of the Americans*, described the basin city as being “bounded by a range of forest-covered hills, sufficiently steep and rugged to prevent their being built upon, or easily cultivated.” Trollope’s book included an account of her family’s climb through the old-growth woods on the Fairview hillside, a slope “so steep that we sometimes fancied we could rest ourselves against it by only leaning forward a little.” When the exhausted group came upon a fallen tree,

the idea of sitting down on this tempting log was conceived and executed simultaneously by the whole party, and the whole party sunk together through its treacherous surface into a mass of rotten rubbish that had formed part of the pith and marrow of the eternal forest a hundred years before.

We were by no means the only sufferers of the accident; frogs, lizards, locusts, katiedids, beetles, and hornets, had the whole of their various tenements disturbed, and testified their

displeasure very naturally by annoying us as much as possible in return; we were bit, we were stung, we were scratched; and when, at last, we succeeded in raising ourselves from the venerable ruin, we presented as woeful a spectacle as can well be imagined.⁵

A French traveler in 1834 noted that the view from the Cincinnati basin was “terminated by ranges of hills, forming an amphitheater yet covered with the vigorous growth of the primitive forest.” Also in 1834, a steamboat passenger lovingly described the Queen City landscape:

The first impression upon touching the quays at Cincinnati, and looking up its spacious avenues, terminating always in the green acclivities which bound the city, is exceedingly beautiful. . . . Verily, if beauty alone confer empire, it is in vain for thriving Pittsburg or flourishing Louisville, bustling and buxom as they are, to dispute with Cincinnati her title of “Queen of the West.”⁶

An 1835 British sightseer found that Cincinnati’s vista of an “undulating well-wooded range of hills gives a freshness to the prospect rarely to be found in a town.” Four years later, another British Rambler informed his readers that Cincinnati is bordered by timbered hillsides, “so that look up and down the streets, whichever way you will, your eye reposes upon verdure and forest trees in the distance.” A German visitor to the city in 1847 described the same scene: “Encircling Cincinnati is a broad ring of bright and wooded hills whose charming depths catch and hold the eye.”⁷

A significant change of the landscape is apparent by 1855 when a travel writer wrote that although Cincinnati is “placed below some nice hills,” the city residents “won’t let their nearest hills alone, but are cutting into them, roads, levels, brickyards, &c., so already they are ugly in bare clay and earth faces, and their fine woods already cut down.” In the same year, a local citizen recalled that at an earlier time “these hills formed a border of such surpassing beauty, around the plain on which Cincinnati stood, as to cause us who remember them in their beauty, almost to regret the progress of improvement which has taken from us what it can never restore.” The nineteenth-century activities that disrupted the hillside forests included logging, quarrying, winemaking, and the construction of transportation routes, all of which will be described below.⁸

Wood was the chief fuel used in Cincinnati during the first half of the nineteenth century. Loggers harvested trees from the city’s basin until the groves became depleted, after which the lumbering operations moved to the slopes encircling the city. Englishman William Newnham Blane, while admiring Cincinnati’s hillside trees that resembled “immense columns, not separating into limbs till at a great distance from the ground,” became upset when told that “these giants of the forest will in a short time be cut down, for fire-wood.” Blane, a visitor from a nation that venerates old timber, predicted that as “Americans improve in taste, this indiscriminate destruction of the fine trees will be regretted, for it will take centuries to replace them.”⁹

The trees that loggers sought for fuel were those whose wood gave the most heat, e.g. beech, ash, and hickory. Some species were cut down to provide lumber for particular needs. The naturally-hollow yellow poplar, for example, was harvested to become wooden pipeage for Cincinnati’s water distribution system. The city’s many tanneries purchased tanbark stripped

from thousands of oaks while a single Cincinnati factory employed 100 men to supply locust and additional suitable woods for the manufacture of carriage parts. Diverse Queen City businesses used particular tree species for the construction of furniture, boats, barrels, wagons, buildings, and railroad ties. By the Civil War, timber harvesting on the local slopes had produced a mosaic of puny tree stands, planted vineyards, and pastures for livestock belonging to farms on the hilltop plateaus. The grazed slopes later became scrubby meadows when residential developers bought up the hilltop farms.¹⁰

The green of vegetated hillsides contrasted with the gray of quarried slopes. Beginning in the early nineteenth century, hillside quarriers stripped away plants and soil to access the layers of limestone and shale that comprise the region's bedrock. Limestone blocks were employed for the construction of building foundations, basement walls, and roadbeds, while crushed shale was used in the manufacture of brick, tile, and pottery ware. Because the market for shale was much less than that for limestone, most of the shale was dumped over the slope across from the exposed quarry wall.¹¹

British scientist Charles Lyell visited some of Cincinnati's hillside quarries during 1842 to study the marine fossils in the mined strata. Lyell, the "Father of Geology," declared that "the organic remains here are remarkably well preserved for so ancient a rock." An *Atlantic Monthly* writer in 1867 did not marvel at the acclaimed fossils but instead described a quarried hillside that had "been dug into, and pared down, until it has about as much beauty as an immense heap of gravel." Unsightly quarries continued operating on every major Cincinnati hillside until contractors began to build with concrete forms instead of limestone blocks. Only the Bald Knob

quarry on the north end of Price Hill persisted into the mid-twentieth century, supplying limestone and shale for use as fill to elevate rail facilities and roads in the Mill Creek Valley.¹²

During the nineteenth century, the hillside quarries of Fairview, Clifton Heights, and Mount Auburn kept company with brewery tunnels dug into the lower sections of the slopes. The beer producers lined their excavations with brick and stocked them with barrels of lager for storage at constant cool temperatures. One of the breweries also drew upon a Clifton Heights hillside spring to obtain water, an essential ingredient of beer. Hillside springs are common in Cincinnati, as attested by the historic springhouse in Fairview Park and the numerous spring-fed lakes at the base of the slope in Spring Grove Cemetery. One spring flowing from an Eden Park hillside supplied over 100 barrels of water daily until it became polluted and was covered by a gazebo, now the icon of the Cincinnati Park Board.¹³

Cincinnati breweries shared hillsides with a second alcohol-producing industry, winemaking. French wine grapes were introduced into the city during the late 1790s but suffered from a growing season that is shorter in the Ohio Valley than in southwestern Europe. Beginning around 1820, Cincinnati's wealthy land speculator and avid horticulturalist Nicholas Longworth joined in a search for an indigenous grape that could successfully produce a marketable wine. The quest brought to light the Catawba grape, a North Carolina plant that likely was a natural hybrid between American and European species. Longworth subsequently planted acres of Catawba vines on the slopes of his Mount Adams property, an advantageous location for a vineyard since it had good drainage and a calcium-rich soil derived from the calcareous shale and limestone bedrock. Longworth also acquired additional hillside properties that he either used for his own

vineyards or transferred to European immigrants with the stipulation that they set out vines and share half their proceeds with him.¹⁴

At a meeting of the Cincinnati Horticultural Society in 1846, Melzer Flagg encouraged fellow members to join Longworth in the purchase of hillsides for the growing of grapes:

The cultivation of the vine gives employment to a peculiar kind of labor, better suited to those rocky and hilly lands than any other; and it will establish a permanent value to vast tracts of lands that are too steep for the plough. . . . Would it not vastly improve our moral condition as a nation, to turn our rocky hills and waste lands into vineyards, from which we could supply all classes with a cheap and wholesome drink, than to continue to exhaust our richer bottom lands in making whiskey?¹⁵

Several Horticultural Society members added to the regional cultivation of grapes by acquiring slopes on which to plant vines. After Longworth determined how to manufacture a very profitable sparkling version of Catawba wine, the total area of local Catawba vineyards grew from 350 acres in 1845 to 743 acres in 1850, 900 acres in 1851, 1,200 acres in 1852, and 1,500 acres in 1855. Steep hillsides downriver of Price Hill that recently had been valued at \$40 per acre sold for grape culture at prices of \$1,000 and \$1,200 per acre. Charles Mackay, a correspondent of the *London Illustrated News* who visited Cincinnati in 1858, reported that the sparkling Catawba was “a wine which competent judges who have tasted all the wines of the world declare to be far superior to any sparkling wine which Europe can boast, whether they come from the Rhine or the Moselle, or from the champagne districts of France.” Mackay added

that American red wines did not show promise “that the clarets of France will ever be surpassed or equalled. But far different is it with French champagne, who, as the Queen of Wines, must yield her sceptre, her crown, and her throne to one fairer, purer, and brighter than she, who sits on the banks of the Ohio.”¹⁶

Near the end of the 1850s, the Cincinnati area produced 35 percent of the U.S. grape crop, about twice the percentage of second-place California. American poet Henry Wadsworth Longfellow in 1859 praised the widely-distributed Catawba wine in verses that also brought attention to Cincinnati’s vineyard-covered hillsides:

This song of mine
Is a Song of the Vine,
To be sung by the glowing embers
Of wayside inns,
When the rain begins
To darken the drear Novembers. . . .

For richest and best
Is the wine of the West,
That grows by the Beautiful River;
Whose sweet perfume
Fills all the room
With a benison on the giver. . . .

And this song of the Vine,
This greeting of mine,
The winds and the birds shall deliver
To the Queen of the West,
In her garlands dressed,
On the banks of the Beautiful River.¹⁷

The grape-growing slopes were depicted in an 1858 *Harper's Weekly*: “thousands of acres, stretching up from the banks of the Ohio, are now covered with luxuriant and profitable vineyards, rivaling in profusion and beauty the vine-clad hills of Italy and France.” But the same vineyards elicited a different reaction from English visitor William Ferguson in 1855: “These give a very artificial and formal character to the landscape; and though they add in an industrial sense to its interest, they do not add to its beauty.” Also in 1855, the black rot and downy mildew caused a marked reduction in the yield of the grapevines, a problem that grew ever larger in the following years. The diseases were not new to the vineyards but they became more prevalent as the vines aged.¹⁸

In the years before Nicholas Longworth's death in 1863, he failed in his search for a new grape that would neither rot nor mildew. Longworth's passing left local vintners without a leader at a time when their workers were leaving to fight in the Civil War or work in wartime industries. Most owners abandoned their undermanned, blighted vineyards by 1870, after which some of the deserted tracts along the crests of hillsides were made available for residential development.

Joseph Longworth, for example, subdivided the upper portions of his father's Tusculum vineyards into homesites for families moving out of the heavily populated central city. The size of Cincinnati had increased from four square miles when it was incorporated in 1802 to seven square miles in 1870, but the town's population growth had greatly exceeded its increase in geographic area. By 1870, Cincinnati's population density was the largest of any American municipality and one of the greatest of any city in the world. Tusculum, Price Hill, and the other highlands around Cincinnati provided the only unoccupied spaces for the city's continued residential growth.¹⁹

Cincinnati's crowded citizens were provided with an extensive greenspace when the city opened Eden Park in 1870. Most of the 207-acre Mount Adams property was acquired through a lease/buy arrangement with Joseph Longworth, whose father's "Garden of Eden" vineyards had been located on much of the land. A newly-appointed Superintendent of Parks directed workers in a number of tasks designed to restore healthy woods to the site's desecrated hillsides. A discontinued quarry was planted with vines, shrubs, and trees, and the park's several eroding slopes were covered with woody species known for their quick-growing roots that hold the soil. During centennial activities in 1876, a vacant hillside was transformed into the first memorial woodland in the nation when it was planted with oaks brought from Valley Forge. Six years later, thousands of citizens celebrated Arbor Day by digging holes into bare slopes and putting in hundreds of trees, creating the Presidents, Authors, and Pioneers Groves. The re-wooded Eden Park became a popular location for picnics since its elevated site was easily accessible from the city basin by foot, horseback, carriage, or public transportation.²⁰

The horse-drawn public transit vehicles that climbed Cincinnati's slopes in 1870 were omnibuses and the streetcars which traveled on tracks that were smoother than the wheel-rutted hillside roads. Through the remainder of the nineteenth century, hilltops surrounding the city basin also could be reached by inclined-plane railways, popularly known as "inclines." An incline consisted of a pair of side-by-side railroad tracks connecting the top to the bottom of a hillside. A powerhouse at the summit held two steam engines, each attached to a steel cable that moved a car up and down its track. The two cars were tethered to each other by a cable that looped around a pulley in the powerhouse, so as one car went up, the other went down. Because the cars were counterbalanced, they could easily be moved by the steam engines unless one car was overburdened. Cincinnati's first incline began operating on the slope of Mount Auburn in 1872, followed by the establishment of inclines on the hillsides of Price Hill (passenger incline 1874, freight incline 1876), Clifton Heights (1876), Mount Adams (1876), and Fairview (1894).²¹

As the cable-operated inclines were being built, Cincinnati's streetcar companies began investigating the use of cables instead of horses to propel their vehicles. Horses were expensive to obtain and replace, required housing and feeding, and sometimes inconveniently died in harness. The animals also deposited volumes of urine and manure on streets and occasionally kicked, trampled, or trod on people. Finally, horses had so much difficulty pulling cars up hillsides that their numbers had to be augmented by the addition of animals held by "hill boys" stationed at the toes of the slopes. It became apparent that a gradient could be ascended more quickly and economically if a streetcar was towed uphill by a cable moving within a trench between the rails, a technology introduced in San Francisco.²²

In 1885, the Gilbert Avenue Cable Railway established an operation to draw its streetcars up the west side of Mount Adams, thereby providing a public transportation alternative to the incline. Horses pulling a streetcar from Cincinnati's Downtown to the toe of the Gilbert Avenue hill were unhitched as the car was attached to the ascending portion of the cable, an endless wire rope that looped around pulleys and the driving wheel that was rotated by a steam engine in the powerhouse. When the streetcar reached the top of the hill, it was detached from the cable and hitched again to a team of horses. The system worked so well that the owners soon retired the company horses and installed cables over the entire length of the route between Downtown and Evanston. By 1888, two more cable companies had commenced operations: the Mount Auburn Cable Railway traveling from Downtown via the Sycamore Street hill, and the Vine Street Cable Railway running from Downtown to Clifton via Clifton Heights.²³

As horse-drawn streetcars on some hillside routes were being supplanted by cable cars, other horse-drawn streetcars were being replaced by electric streetcars. A trolley traveling on an overhead wire supplied enough electricity to move a streetcar without the aid of either a horse team or a cable. Electric streetcars replaced the Gilbert Avenue and Vine Street Cable Railways in 1898 and the Mount Auburn Cable Railway in 1902, the same year in which Cincinnati's last horse-drawn streetcar was converted to electric operation. The Gilbert Avenue cable powerhouse remains standing near the top of the Gilbert Avenue hill and the Mount Auburn cable powerhouse and car barn survives at the northwest corner of Highland and Dorchester.²⁴

Cincinnati's inclined-plane railways likewise suffered from competition against the electric streetcars that effortlessly climbed the city's hillsides. The Mount Auburn Incline was abandoned in 1898—its right-of-way is occupied by the Main Street Steps built in the early 1940s by the

Works Progress Administration. The Fairview Incline carried its last passengers in 1923, and three years later the Elm Street Incline to Clifton Heights closed for renovations and never reopened. After gasoline-powered trucks began ascending the hillside streets, the Price Hill Incline's freight plane shut down in 1929. Structural problems resulting from inadequate maintenance funding caused the closures of the Price Hill Incline's passenger plane in 1943 and the Mount Adams Incline in 1948. The hillside corridors of the Fairview, Elm Street, and Price Hill Inclines are now tree-covered while the right-of-way of the Mount Adams Incline is occupied by housing and vacant lots.²⁵

Streetcars quit scaling Cincinnati's slopes in 1951, leaving only rubber-wheeled vehicles to continue climbing the roads. People also ascend the city's hillsides by walking up inclined sidewalks and nearly 400 stairways—only San Francisco exceeds Cincinnati in the number of stairsteps available to citizens. Of the public steps in the Queen City, the best known are those that lead up the Mount Adams slope to Immaculata, the “church of the steps.” On every Good Friday since the hilltop structure was finished in 1859, thousands of people say a prayer on each step as they quietly scale the hillside. Another historic Mount Adams stairway climbs from the Elsinore Arch on Gilbert Avenue to Eden Park.²⁶

After Eden Park was opened in 1870, the Queen City's accession of greenspace failed to keep pace with its population growth. Cincinnati at the start of the twentieth century had less parkland than that of any other municipality of its size in the nation, a civic embarrassment which caused the city to accelerate its acquisition of new park properties. In 1906, Cincinnati engaged landscape architect George E. Kessler to design a plan for more parks, just as he had

accomplished for Kansas City, Indianapolis, and Syracuse. Kessler promptly communicated his enthusiasm to plan new public spaces for the city's landscape of hillsides:

Cincinnati is particularly adapted to the connected park system, and it is a source of great wonder to me that the opportunities nature has thrust into the hands of the city have so long been neglected. Few cities in the world are provided with precipitous hills which thrust themselves directly into the heart of the community.²⁷

Kessler found that Cincinnati's hillsides, which were logged, grazed, cultivated, and quarried in the previous century, had by 1906 been reforested by trees growing from wind- and animal-dispersed seeds. A dozen years earlier, Cincinnati chroniclers S. B. Nelson and J. M. Runk had reported that "Even the side-hills and the abandoned quarries are fertile, and soon clothe themselves with luxurious vegetation." Ecologists have determined that properties in the Cincinnati region that are cleared and then abandoned will within 25 years be covered by new woodland.²⁸

Kessler's 1907 report, "A Plan for a Comprehensive System of Parks and Parkways," proposed a web of parkways tying together new and existing parks. For example, a park located at the crest of a hill would be connected to another such park by a route like the city's already-proposed Columbia Parkway, a road situated midway up the slopes of Ohio River hillsides east of Downtown Cincinnati. Kessler stipulated that the corridor of a parkway should be of ample width to preserve a broad swath of a slope as public land. Kessler's report called for the

construction of hillside parks and parkways along the valleys of the Ohio River (e.g. Larz Anderson Park), Little Miami River (e.g. Ault Park), and Mill Creek (e.g. Mount Storm Park).²⁹

In 1925, Cincinnati's inaugural city plan included Kessler's proposal to protect the basin-framing Price Hill, Fairview, Clifton Heights, Mount Auburn, and Mount Adams slopes that the City Planning Commission declared to be "wonderful" as they added "greatly to the impression of Cincinnati on the visitor." The plan especially encouraged the preservation of the woodland along Price Hill where developers were "breaking into the natural charm of the hillside, both from the top down and from the bottom up." The city planners were concerned that the Price Hill slope would be terraced for housing, as already had occurred on portions of the Mount Auburn and Mount Adams hillsides. The Cincinnati plan warned that Price Hill's "verdure will soon be lost unless action is taken by the city."

The 1925 plan also supported Kessler's recommendation to safeguard the upper portions of the Price Hill and Mount Adams slopes above the Ohio River, as well as the entirety of Tusculum's hillsides at the confluence of the Ohio and Little Miami River Valleys. But the plan questioned "whether it is worth the city's while to spend the money necessary to acquire" property on additional hillsides. The plan conceded that if the unsecured slopes "would be despoiled, there is little question but that future citizens would never forgive the present City Fathers for not acquiring these hills."³⁰

Cincinnati made land purchases and accepted property donations to procure a few of the hillside tracts identified in both the city plan and the Kessler report, e.g. Alms, Fairview, and Mount Echo Parks. The city also obtained California Woods in the Little Miami River Valley and LaBoiteaux Woods in the Mill Creek Valley, two thickly-forested hillside properties not

identified in the Kessler document. Finally, hillside parklands were acquired in areas that had not yet been annexed to the city when Kessler submitted his report, e.g. Caldwell Park, Mount Airy Forest, and Stanbery Park. Columbia Parkway, conceived prior to Kessler's work, was the only hillside parkway to be completed.

British writer and politician Winston Churchill stopped in Cincinnati in 1933 and declared it to be the most beautiful inland city in the nation. The municipality added a few more tree-covered slopes to its park system during the years following Churchill's visit but most hillside acreage remained in nonpublic ownership. In the 1960s, as modern architectural and engineering techniques began to make construction possible on previously unbuildable slopes, city leaders and organizations began to fear that a number of Cincinnati's privately-owned wooded hillsides might again be cleared for individual gain. The Cincinnati Art Museum in 1967 hosted a "Hillside Forum" for concerned parties to hear presentations by City of Cincinnati department heads and invited professionals in the areas of building construction, real estate, and environmental planning.³¹

The City Planning Commission in 1969 published the *Hillside Study* in which 23 critical slopes were listed along with their natural characteristics and general suitability for development. Two years later, in a report funded by the Planning Commission, Richard A. Gardiner & Associates outlined a process for the city to ensure acceptable hillside construction. Also in 1971, the non-profit Cincinnati Institute initiated studies of the city's slopes, including research on soil types, tree patterns, visual characteristics, land uses, and the general public's perceptions and values. The research findings formed the basis for the Institute's 1975 report entitled *Cincinnati*

Hillsides Development Guidelines, completed for the City Planning Commission. The goal of the piece was stated in its introduction:

To date the hillsides are largely tree covered and relatively uncompromised by development. In the past, using animal and human labor, man had no choice but to respect the natural constraints of the land. Today, when the power of applied technology is limited only by economics, new kinds of restraints are required if the very land which makes our city is to be preserved. The hillsides are preeminent in determining Cincinnati's character and this report is intended to guide those who seek to build upon them in the last quarter of the twentieth century.³²

The report's 49 guidelines covered tree retention, earth moving, retaining walls, access roads, parking areas, building shapes, landscaping, and other construction issues. The City Planning Commission began to apply the guidelines in 1976 as it evaluated proposed developments on a number of the slopes identified in the Commission's earlier *Hillside Study*. Also in 1976, the Cincinnati Institute founded the Hillside Trust, a successful non-profit that protects slopes through education, advocacy, and the preservation of donated hillside properties and easements. A major activity of the land trust has been to scrutinize proposed developments for their susceptibility to hillside-scarring landslides and to suggest steps that would reduce the likelihood of such slope failures.³³

Landslide damage in the Cincinnati area was quantified in a 1980 investigation by the U.S. Geological Survey. The research found that from 1973 through 1978 the cost of landslides

occurring in Cincinnati and the surrounding Hamilton County totaled \$30,990,000, or an average of \$5,165,000 per year. For purposes of comparison, the study calculated the annual per-capita expenditure to be \$5.80. Cost figures for other urban localities that experience landslides were \$1.30 per person per year in the San Francisco region, \$1.60 in the Los Angeles area, and \$2.50 in the Pittsburgh vicinity. The greater economic damage in the Cincinnati region primarily was due to frequent landslides of the shale-derived, slippery soil that covers area hillsides. Landslides also occur in the clay-rich Ice Age glacial sediments present on some slopes.³⁴

Landslides are the result of a change in the relationship between the two physical forces that oppose each other on a hillside. One is the earth's gravity that pulls everything down and the other is the frictional strength that causes hillside material to resist movement, or failure. A slope remains stable as long as its resistance to failure is greater than the gravitational forces acting upon it. On the other hand, a slope becomes unstable when gravitational forces exceed the hillside material's resistance to failure. Gravitational forces increase and a landslide may occur as building fill, construction debris, or other heavy substances are loaded on the top or slope of a hill. A landslide also may be brought about when the natural hillside materials are lubricated by excessive amounts of water, e.g. from a broken pipe or from storm runoff directed down the hillside from a paved upland surface. In addition, a slope may fail when a construction cut on the lower part of a hill removes the lateral support of upslope material.³⁵

The woodlands growing on Cincinnati hillsides add to the stability of the city's slopes because tree roots act to bind the soil and anchor it to the bedrock. Removing trees from a hillside often results three to five years later in the landsliding of the slope. Cleared hillsides in

Cincinnati are subject to failure at slope angles of as little as twelve degrees while tree-covered slopes may maintain angles as high as 35 degrees.³⁶

Human-caused landslides, which have been recorded in Cincinnati since the 1800s, grew in number during the last third of the twentieth century as an increasing number of slopes were cleared for developments “with a view.” To inform builders of the risk of hillside construction, the city in 1980 contracted for the production of a map of Cincinnati illustrating four categories of landslide susceptibility: high, moderately high, moderate, and low. The Cincinnati Zoning Code in place since 2004 places a property within a Hillside Overlay District if any portion of the lot is designated high or moderately high in landslide susceptibility and/or if any part of it contains a slope of twenty percent or greater. The stated purpose of Hillside Overlay District zoning is to make certain “that development will be compatible with the natural environment and respect the quality of the urban environment in those locations where the hillsides are of significant public value.”³⁷

The city uses the *Cincinnati Hillsides Development Guidelines* to evaluate landslide prevention plans and building designs of any proposed project in a Hillside Overlay District. A construction permit is granted only upon the fulfillment of certain requirements: 1) a preliminary geo-technical evaluation must address relative hillside stability, 2) excavations and fills must not exceed eight feet in cumulative height, 3) retaining walls must not exceed eight feet in height, 4) any new building or building alteration must be contained within a maximum building envelope determined by the city, 5) buildings placed on top of the hillside must be taller than wider to accentuate the vertical dimension, 6) buildings placed below or above the brow of the hill must be staggered or stepped in depth and width to match the topography, 7) rooftop utilities and

mechanical equipment should be avoided or at least integrated into the rooftop through screening and sound control, and 8) plants must be grown on all pervious surfaces remaining at the completion of construction.³⁸

Cincinnati's Hillside Overlay District zoning has prevented large slope failures at private developments on hillside properties. In contrast, landslides continue to occur along public thoroughfares, many of which were built in the nineteenth century. Edward Orton, Ohio's Assistant State Geologist in 1873, warned Cincinnati that the construction of Gilbert Avenue on the slope of Mount Adams would make the hillside unstable. Orton was proven correct when an 1886 landslide required a section of the road to be rebuilt. Soon thereafter, the construction of Elberon Avenue on the side of Price Hill was interrupted by a landslide of soil and shale wastes descending from an abandoned quarry. A 1963 landslide at the same site was 300 feet wide, extended over 200 feet vertically to the base of the former quarry, damaged a home that subsequently was condemned, and shut down two-way traffic on Elberon until the landslide debris could be trucked away. Maryland Avenue, another hillside street on Price Hill, was permanently closed to through traffic following a series of landslides in the mid-1980s.³⁹

The landslide activity associated with hillside roads typically is triggered by their cut-and-fill method of construction. To provide a bench for a road being built on a hillside, a cut is made into the slope on the uphill side of the right-of-way and the material from the cut is placed as fill on the downhill side. The cut removes the lateral support for the upslope soils and thus can lead to a landslide. In addition, the combined weight of the fill and road-building materials can set off a landslide downhill of the roadway bench. A massive slope failure brought about by a cut-and-fill project occurred in 1930 when about a quarter-mile of the under-construction Columbia Parkway

dropped several feet down a hillside. Since the parkway's completion, soil and quarry debris slides often spill over the road's retaining wall and close traffic lanes for hours or days. An especially large landslide in March 1975 toppled about 160 feet of the retaining wall and, according to a June 1975 city memorandum, "precipitated much public concern regarding such occurrences not only above Columbia Parkway, but at other locations throughout the city as well, and gave rise to many demands the City prevent such reoccurrences."⁴⁰

The Cincinnati public in 1975 was wary of landslides because the latest estimate to correct a two-year-old slope failure on Mount Adams was \$10 million. The Mount Adams slide had been triggered by contractors cutting into the toe of the hill to make space for an exit ramp from Interstate-471. A retaining wall costing over \$22 million finally stabilized the hillside in 1981, but not before approximately 60 families had been permanently evacuated from their homes. Since the collapse of the Mount Adams slope, Cincinnati's hillside thoroughfares and driveways have been carefully designed, reviewed, and built to avert landslides.⁴¹

In 1792, Oliver Spencer beheld Cincinnati hillsides in the spring when "the redbud, the hawthorn, and the dog wood, in full bloom, checkered the hills, displaying their beautiful colours of rose and lily." Cincinnati chroniclers Benjamin Drake and Edward Mansfield depicted the hills in 1826 as "beautiful and picturesque" with "gentle and varying slopes, which are mostly covered with native forest trees." The wooded slopes were mostly cleared during the following decades but later returned to their original forested state. Cincinnati now protects its hillsides and, in the words of local author John Tallmadge, the city is again graced with "refreshing corridors of wild green."⁴²

¹ Joseph Pierce and Crystal Kolden, "The Hilliness of U.S. Cities," *Geographical Review* 105, no. 4 (Sept. 2015): 588, 594; Tom Graham, "City of Hills," *The San Francisco Chronicle*, Nov. 7, 2004, PK-20; William B. Meyer, "A City (Only Partly) on a Hill: Terrain and Land Use in Pre-Twentieth-Century Boston," in Anthony N. Penna and Conrad Edick Wright, *Remaking Boston: An Environmental History of the City and Its Surroundings* (Pittsburgh: University of Pittsburgh Press, 2009), 141-44; Robert W. Fleming and Fred A. Taylor, *Estimating the Cost of Landslide Damage in the United States* (Washington DC: U.S. Department of the Interior, 1980), 1.

² "Cincinnati: Its Relations to the West and South," *The West American Review* 1 (June 1853): 79-80; Edgar Erskine Hume, "The Naming of Cincinnati," *Queen City Heritage* 41, no. 2 (Summer 1983): 10, 13.

³ Richard Butler, "Journal of General Butler," *The Olden Times* 2 (Oct. 1847): 454; David Stradling, *Cincinnati: From River City to Highway Metropolis* (Charleston, SC: Acadia Publishing, 2003), 15.

⁴ Daniel Drake, *Discourses Delivered by Appointment, Before the Cincinnati Medical Library Association, January 9th and 10th, 1852* (Cincinnati: Moore and Anderson, 1852), 27-31; Edward Deering Mansfield, *Memoirs of the Life and Services of Daniel Drake* (Cincinnati: Applegate and Co., 1855), 137.

⁵ Frances Trollope, *Domestic Manners of the Americans* (London: s.n., 1832), 1: 56, 134-35.

⁶ Michel Chevalier, *Society, Manners and Politics in the United States* (Boston: Weeks, Jordan and Co., 1839), 195; Charles Fenno Hoffman, *A Winter in the West* (New York: Harper and Brothers, 1835), 2: 129-30.

⁷ Charles Augustus Murray, *Travels in North America During the Years 1834, 1835 and 1836, Second Edition* (London: Richard Bentley, 1841), 1: 203; Frederick Marryat, *A Diary in America, with Remarks on Its Institutions* (London: Longman, Orme, Brown, Green, and Longmans, 1839), 2(1): 147; Franz von Löher, tr. Frederick Trautmann, "Cincinnati and Southwestern Ohio Through a German's Eyes," *Queen City Heritage* 45, no. 2 (Summer 1987): 22.

⁸ John W. Oldmixon, *Transatlantic Wanderings* (London: G. Routledge and Co., 1855), 115; S. B. Nelson and J. M. Runk, eds., *History of Cincinnati and Hamilton County, Ohio* (Cincinnati: S. B. Nelson and Co., 1894), 73.

⁹ William Newnham Blane, *An Excursion Through the United States and Canada During the Years 1822-23* (London: Baldwin, Cradock, and Joy, 1824), 125-26.

¹⁰ Daniel Drake, *Natural and Statistical View, or Picture of Cincinnati and the Miami Country* (Cincinnati: s.n., 1815), 140; Thomas Hulme, *Journal of a Tour in the West (Ohio, Indiana, and Illinois) in 1818*, reprinted in Reuben Gold Thwaites, ed., *Early Western Travels, 1748-1846* (Cleveland: Arthur H. Clark Co., 1904), 10: 42; Benjamin Drake and E. D. Mansfield, *Cincinnati in 1826* (Cincinnati: s.n., 1827), 31; A. B. Plowman, "The Work of the Spoilers," *Forestry and Irrigation* 14, no. 7 (July 1908): 365; Charles Cist, *Sketches and Statistics of Cincinnati in 1859* (Cincinnati: s.n., 1859), 330, 332; Sidney D. Maxwell, *The Suburbs of Cincinnati* (Cincinnati: George E. Stevens and Co., 1870), 14.

¹¹ Drake and Mansfield, *Cincinnati in 1826*, 27; Edward Orton, “The Cincinnati Group, or Blue Limestone Formation,” *Report of the Geological Survey of Ohio* (Columbus: Geological Survey of Ohio, 1873), 1(1): 378; William Ferguson, *America by River and Rail* (London: James Nisbet and Co., 1856), 270; Nevin M. Fenneman, *Geology of Cincinnati and Vicinity* (Columbus: Geological Survey of Ohio, 1916), 179.

¹² Charles Lyell, *Travels in North America* (London: John Murray, 1845), 2: 49; James Parton, “Cincinnati,” *The Atlantic Monthly* 20 (Aug. 1867): 236; John Adams Bownocker, *Building Stones of Ohio* (Columbus: Geological Survey of Ohio, 1915), 19; Tim Agnello, “Historic Rock Quarries and Modern Landslides in Price Hill, Cincinnati,” *Ohio Geology* (Fall 2005): 1-3; John P. Ford, *Bedrock Geology of the Cincinnati West Quadrangle and Part of the Covington Quadrangle, Hamilton County, Ohio, Ohio Division of Geological Survey Report of Investigations No. 93* (Columbus: State of Ohio, 1974), map.

¹³ Robert A. Musson, *Brewing Beer in the Queen City, Second Edition* (Medina OH: Zepp Publications, 2012), 1: 15, 63; Michael D. Morgan, *Cincinnati Beer* (Charleston SC: American Palate, 2019), 48; Geoffery J. Giglierano, Deborah A. Overmyer, and Frederic L. Propas, *The Bicentennial Guide to Greater Cincinnati: A Portrait of Two Hundred Years* (Cincinnati: Cincinnati Historical Society, 1988), 238, 441; *Guide to Art and Architecture in Cincinnati Parks* (Cincinnati: Cincinnati Park Board, 1995), 22.

¹⁴ Drake, *Discourses*, 24; Charles T. Greve, *Centennial History of Cincinnati* (Chicago: Biographical Publishing Co., 1904), 1: 712; Erica Hannickel, *Empire of Wines* (Philadelphia: University of Pennsylvania Press, 2013), 136, 138; Marian Knight, “Historic Mount Adams,” *Cincinnati Historical Society Bulletin* 28, no. 1 (Spring 1970): 27; Robert Russell, *North America, Its Agriculture and Climate* (Edinburgh: Adam and Charles Black, 1857), 87.

¹⁵ Melzer Flagg, *Remarks on the Culture of the Grape, and the Manufacture of Wine, in the Western States, Comprised in a Report Made by the Direction of the Cincinnati Horticultural Society, May 2, 1846* (Cincinnati: Melzer Flagg, 1846), 11-12.

¹⁶ Hannickel, *Empire of Wines*, 253; “The Ohio Grape Vintage for 1855,” *DeBow’s Review* 19 (Dec. 1855): 722; “The Vineyards of the West,” *Ohio Cultivator* 6 (Oct. 1, 1850): 301; Charles Cist, *Sketches and Statistics of Cincinnati in 1851* (Cincinnati: W. H. Moore and Co., 1851), 266; Cist, *Cincinnati in 1859*, 338; William Prescott Smith, *The Book of the Great Railway Celebrations of 1857* (New York: D. Appleton and Co., 1858), 214; Charles Mackay, “American Vineyards and Wine,” *London Illustrated News*, Jan. 27, 1858, reprinted in *Southern Cultivator* 16, no. 6 (June 1858): 190.

¹⁷ Hannickel, *Empire of Wines*, 105; Henry Wadsworth Longfellow, *The Courtship of Miles Standish, and Other Poems* (Boston: Ticknor and Fields, 1859), 178-81.

¹⁸ “Nicholas Longworth, Esq., of Cincinnati, and the Vineyards of Ohio,” *Harper’s Weekly* 2, no. 82 (July 24, 1858): 474; Ferguson, *America*, 284; “Ohio Grape Vintage,” 722; Cist, *Cincinnati in 1859*, 338.

¹⁹ William J. Flagg, "Wine in America and American Wine," *Harper's New Monthly Magazine* 41, no. 241 (June 1870): 112; John F. Von Daacke, "Grape-Growing and Wine-Making in Cincinnati, 1800-1870," *Bulletin of the Cincinnati Historical Society* 25, no. 3 (July 1967): 211; Daniel Hurley, *Cincinnati: The Queen City, Third Edition* (Cincinnati: Cincinnati Historical Society, 1996), 76; Henry A. Ford and Kate B. Ford, *History of Cincinnati, Ohio* (Cleveland: L. A. Williams and Co., 1881), 121.

²⁰ Blanche Linden-Ward, "The Greening of Cincinnati: Adolph Strauch's Legacy in Park Design," *Queen City Heritage* 51, no. 1 (Spring 1993): 24-25; Thomas R. Schiff and Owen Findsen, *Panoramic Parks* (Cincinnati: Thomas R. Schiff and Lightbourne Publishing, 2005), 11.

²¹ Richard M. Wagner and Roy J. Wright, *Cincinnati Streetcars* (Cincinnati: Wagner Car Co., 1969), 5; John H. White Jr., *Cincinnati, City of Seven Hills and Five Inclines* (Cincinnati: Cincinnati Railroad Club, 2001), 11, 13, 17-18; Roy Hotchkiss, *The Price Hill Inclined Plane Railroad Co.* (Cincinnati: Price Hill Historical Society Museum, 1999), 3-5.

²² Daniel Hurley, "Building Community Through Mass Transit: Metro at 25," *Queen City Heritage* 56, no. 1 (Spring 1998): 29.

²³ Wagner and Wright, *Cincinnati Streetcars*, 75-79, 84, 92.

²⁴ Wagner and Wright, 83, 87, 93.

²⁵ Mary Anna DuSablón, *Walking the Steps of Cincinnati* (Athens: Ohio University Press, 1998), 35-36; White Jr., *Cincinnati*, 22-23, 26.

²⁶ Hurley, "Mass Transit," 42; DuSablón, *Walking the Steps*, xiii, xv, 7; Caroline Williams, *Mirrored Landscapes of Cincinnati* (Cincinnati: Cincinnati Enquirer, 1939), 78.

²⁷ Andrea Tuttle Kornbluh, "Parks and People: The Place of the Kessler Plan in the History of Parks and Public Recreation," *Queen City Heritage* 51, no. 1 (Spring 1993): 56; "Kessler to Cincinnati," Aug. 11, 1906, unidentified newspaper in scrapbook, Kessler Collection, Missouri Historical Society, reprinted in Kurt Culbertson, "The Origins of Landscape Architecture in Ohio: The Life and Work of George Edward Kessler," *Queen City Heritage* 51, no. 1 (Spring 1993): 16.

²⁸ Nelson and Runk, *History*, 61; Martha Hoye, Janice V. Perino, and Charles H. Perino, "Secondary Vegetation and Successional Sequences Within Shawnee Lookout Park, Hamilton County, Ohio," *Castanea* 44, no. 4 (Dec. 1979): 210-11.

²⁹ George E. Kessler and Co., "A Plan for a Comprehensive System of Parks and Parkways," reprinted in Park Commission of Cincinnati, *A Park System for the City of Cincinnati* (Cincinnati: City of Cincinnati, 1907), 4, 13, 30-31, 36-37, 41-42.

³⁰ *The Official City Plan of Cincinnati, Ohio* (Cincinnati: City Planning Commission, 1925), 166-67, 171.

³¹ Winston Churchill, "Land of Corn and Lobsters," *Collier's* 91 (Aug. 5, 1933): 45; Eric Russo and Tim Agnello, "Urban Hillside Protection: A Case Study of Cincinnati, Ohio, United States of America," *Landscape Architecture* 2018, no. 12 (Dec. 2018): 19.

³² *Zoning Code of the City of Cincinnati*, Chapter 1433; E. Pope Coleman, *Cincinnati Hillsides Development Guidelines* (Cincinnati: Cincinnati Institute, 1975), i, 3-4.

³³ Russo and Agnello, "Urban Hillside Protection," 20.

³⁴ Fleming and Taylor, *Landslide Damage*, 1; Agnello, "Historic Rock Quarries," 1, 3.

- ³⁵ Timothy J. Agnello, *Land Use and Landsliding in Price Hill, Cincinnati*. M.S. Thesis, University of Cincinnati, 1-79.
- ³⁶ Mary M. Riestenberg and Susan Sovonick-Dunford, “The Role of Woody Vegetation in Stabilizing Slopes in the Cincinnati Area, Ohio,” *Geological Society of America Bulletin* 94 (1983): 517.
- ³⁷ Edward Orton, “Geology of Hamilton County,” *Report of the Geological Survey of Ohio* (Columbus: Geological Survey of Ohio, 1873), 1(1): 424; *Zoning Code*, Chapter 1433; Russo and Agnello, “Urban Hillside Protection,” 21.
- ³⁸ *Zoning Code*, Chapter 1433.
- ³⁹ Orton, “Hamilton County,” 424; John H. White Jr., “The Mt. Adams & Eden Park Inclined Railway, ‘The Kerper Road’,” *Bulletin of the Historical and Philosophical Society of Ohio* 17, no. 4 (Oct. 1959): 270; Agnello, “Historic Rock Quarries,” 4-5.
- ⁴⁰ Jay Gilbert, “Slide Show,” *Cincinnati Magazine* 52 (Aug. 2019): 34-37; “Memorandum, June 30, 1975,” reprinted in City of Cincinnati Department of Transportation and Engineering, *2019 Columbia Parkway Landslide Evaluation and Report* (Cincinnati: City of Cincinnati, 2019), 7.
- ⁴¹ Jay Gilbert, “A Great Wall,” *Cincinnati Magazine* 51 (June 2018): 36-39; Rex L. Baum and Arvid M. Johnson, “Overview of Landslide Problems, Research, and Mitigation, Cincinnati, Ohio, Area,” *U.S. Geological Survey Bulletin 2059-A* (Washington DC: U.S. Department of the Interior, 1966), 13.

⁴² Oliver M. Spencer, *Indian Captivity: A True Narrative of the Capture of the Reverend O. M. Spencer, by the Indians, in the Neighborhood of Cincinnati* (New York: Carlton and Porter, 1860), 32; Drake and Mansfield, *Cincinnati in 1826*, 25; John Tallmadge, *The Cincinnati Arch: Learning from Nature in the City* (Athens: The University of Georgia Press, 2004), 13.