The Pittsburgh metropolitan region has a distinctive urban landscape. The complex tapestry of hills and valleys hung on the framework of the three rivers has forced Pittsburghers to adapt to its many environmental challenges. In turn, Pittsburghers have engineered the environment to serve their needs. This complicated interaction between man and environment has created a variety of landscape characteristics that Pittsburghers may take for granted, but fascinate visitors and become part of the impression they take with them. A short essay cannot capture the richness of Pittsburgh's urban landscape, but by looking at the interactions between man and his environment, it can suggest what landscape means to a geographer and ask readers to look discerningly at the landscape around them.
The houses on Maryland Ave., Millvale, adapt to the hilly terrain.

Monongahela incline to Mt. Washington.

The J&L works on Pittsburgh's South Side located, as most steel mills did, on a level flood plain at a bend in the river.
Today, for example, nearly all of the industrial landscape of the great Homestead Works of U.S. Steel has been demolished, although a few features — the stacks from the soaking pits of the 45-inch universal mill, the gantry crane, the pump house and water tower, symbols of the violent strike in 1892 — have been preserved. They exist somewhat diminutively and out of context amidst the stores, restaurants, offices, and townhouses of the new Waterfront development. In addition to these consciously preserved historical features, the industrial past’s legacy can be detected in the very broad expanse and flat contour of the site itself, as well as in its bulkheaded, steep, and hard river edge.

Landscape Defined

The word “landscape” embraces many meanings. To most Americans, landscape conjures images of natural scenery, especially in paintings and photographs. To landscape means, “to improve the appearance... by planting trees, shrubs, or grass, or altering the contours of the ground.” Thus, a landscape architect designs the grounds around businesses, homes, or even highways with ornamental plants, gardens, or even more ambitious features like ponds or waterfalls. For a geographer, however, landscape is a central organizing concept of great importance. Landscape of the geographer’s definition “encompasses everything to be seen in our ordinary surroundings.” It includes the physical properties of land, the flora and fauna, climate, and the activities of man such as farming, industry, and buildings. Indeed, the landscape includes man, too! One cannot fully describe a landscape without describing the people inhabiting it. Thus, a landscape is cultural and historical. The landscape manifests a culture’s use of the land throughout its history, and specific features of the landscape may hold symbolic importance for the culture. While many cultural features may disappear over the decades or centuries, other features survive intact, in an altered form, or as a legacy in some subtle manner.

Prior to its industrialization around 1880, farms of wealthy old families, Pittsburgh’s poor farm, a railroad, and an incipient suburban development dominated the Homestead area. The layout and names of streets in Homestead reflect both the rural and suburban pasts. After 1880, Carnegie Steel and its successor U.S. Steel shaped the flood plain to accommodate its requirements for an enormous steel works. The communities attracted many immigrant workers from mostly European countries, who lived and worked along with American workers and managers. The churches, social institutions such as the Carnegie Library or the Bulgarian-Macedonian National Education and Cultural Center, and homes still convey this multi-ethnic and class-divided past even as new residents, mostly African American, shape a new community. Both the former mill site and the adjacent communities reveal these pasts to the careful observer and the researcher.

Each era of Pittsburgh’s history — the frontier period before 1820, the commercial period that lasted until the Civil War, the industrial era from the Civil War well past World War II, and the post-industrial period of contemporary Pittsburgh — had, or has, its characteristic landscape. The predominance of particular
economic activities, technologies, architectural styles, and spatial organizations fashioned the landscape in ways we recognize. Thus, for example, the steel mills and railroads along the rivers with adjacent dense, multi-ethnic communities having brick and frame rowhouses remain a clear image of that industrial landscape. Each new period clears away much of the old, retains and reuses some of it, and encompasses decaying and abandoned features. In their particularities, these periods are the landscape of Pittsburgh.

In many ways, Pittsburgh shares a lot in common with the landscapes of other North American cities. From the varied national architectural styles and concentration of tall buildings in downtown, to the parkways packed with speeding cars and the suburban shopping malls and residential subdivisions that sprawl outward into Allegheny County and beyond, the casual observer might not see the distinctiveness of Pittsburgh.

Within these typical landscapes, however, one can decipher adaptations that have been made to develop the environment of southwestern Pennsylvania. Hilltops have been flattened to accommodate shopping malls. The massive engineering of the hills and valleys on the way to the airport in Robinson Township illustrates how we have altered the environment, sometimes brutally.

In another obvious example, the sharp angles created by the junction of downtown's two street grids at Liberty Avenue represents an adaptation in which we conformed to the environment in a culturally informed manner. In the late 18th century, the surveyors laying out the street plan of Pittsburgh understood that water, in this case the rivers, was the focus of economic life for important cities, and so they oriented the plan to the best potential for a wharf: the Monongahela riverfront. Assuming that the Allegheny River might also be commercially useful, they fronted another grid to that river. Since the two rivers do not parallel each other (as the Schuykill and Delaware do in Philadelphia), the grids had to meet at a sharp angle.

While the intersection of the grids has frustrated traffic engineers concerned with the expeditious flow of vehicles, architects and pedestrians have enjoyed the resulting triangular lots and interesting shapes of buildings. The junction also enhances vistas along streets, which end at buildings. From Market Square, for example, the line of sight north up Market Street ends at the waterfall in the plaza beside Heinz Hall. In the rectangular plans of most cities, streets become canyons opening endlessly as far as the eye can see.

**Rivers**

The rivers established the basic framework for settlement in the region. Of course, the convergence of the rivers to form the Ohio River provided the best route to the center of the continent, and the peninsula (the Point or downtown) created by the convergence offered the logical military and commercial point to control the route. The limited amount of flat land afforded by the region's rugged terrain meant that transportation routes and urban development would concentrate in the river and stream valleys on valuable flood plains. First major roads, then railroads, wended along the
river valleys. These in turn served to attract early commercial and manufacturing activities.

With the flat lands of downtown, the South Side, Allegheny City, and the Strip District largely developed by 1880, the iron and steel, electrical equipment, glass, aluminum, and other industries looked farther afield — sites along the three rivers and in tributary valleys like Turtle Creek and Chartiers Creek. By the early 20th century, industrial development had spread 30 miles from downtown along the rivers. Industrial towns grew on the insides of the river curves where the flood plains had formed over thousands of years of fluvial processes. Steep bluffs edged the outside of curves.

The resulting pattern of industrial towns alternating from one side of the river and then around the next bend to the other side of the river has often been likened to beads on a string. Whereas most American cities spread out from an original harbor onto broad plains in a roughly concentric manner, Pittsburgh's "blob" of developed land, as seen on a map, resembles an octopus with long tentacles (though with less than eight of them) reaching in several directions.

The rivers presented many problems for effective settlement and use. In addressing those problems, we have over the years greatly changed the riverine environment and intruded upon it with a number of man-made structures. Besides providing a water supply and an easy means of waste disposal, the rivers have been foremost a routeway. Most images of Pittsburgh include boats — rafts and keelboats, steamboats docked at the wharf, large diesel towboats pushing several barges lashed together, and small recreational craft — that tie the photo to its time period.

Droughts, floods, ice, snags, ripples, and sandbars, however, impeded smooth navigation. For most of the 19th century, private contractors and then the Army Corps of Engineers tried to clear the obstacles and create deeper channels with explosives and small dams, but little permanent improvement was accomplished. First water levels that submerged beaches, bars, mudflats, and wetlands. They also severely disrupted natural erosion patterns, and regularized river flows such that they appear almost as a series of pools. The rivers we have come to know are not the same as the ones our forefathers knew.

Until the completion of the locks and dams in the 1920s, floods were almost an annual nuisance for businesses and residents located on the flood plains. Severe floods periodically caused loss of life and enormous property damage. Although locks and dams did diminish the impact of minor flood conditions, only the erection of large impoundment reservoirs in the watersheds of the Allegheny and Monongahela rivers after World War II significantly lessened the threat of disastrous floods. Building regulations for riverfront sites and buildings with elevated basement levels reflect adaptations despite the diminished incidences of floods. Tributary streams, however, have become more susceptible to destructive flash floods because of urban development. Increased paving of ground surfaces decreases the absorption of water into the ground and accelerates run-off into streams. Concrete culverts built to channel and contain streams are another common landscape characteristic around the region.

While the rivers and the river valleys facilitated most transportation, they presented barriers to easy and necessary communication between the opposite sides of the rivers. Ferries crossed the rivers in the first few decades of settlement, but they proved to be inadequate for the rapidly growing city. Two private companies built and operated low wooden toll bridges in 1818 and 1819, respectively, to connect downtown with the settlements across the Allegheny and Monongahela rivers. By the Civil War, five more bridges were built. The demand for bridges over the rivers, streams, and ravines escalated with the spatial expansion of the metropolitan region.

By the beginning of the 20th century, federal, state, and local
governments took over the task, eliminated tolls, and erected hundreds of bridges, including ones over railroads and highways. They ranged from modest wooden and concrete pedestrian spans to elegant and high-flying bridges. Innovative bridge engineers such as John Roebling erected significant and graceful structures in the region. Depending on the definition of a bridge, Allegheny County has between 900 and 1,600 bridges. Pittburghers hardly notice the bridges unless congested with vehicles converging on them or closed for repairs. Visitors, however, are struck by the large number of them and the dramatic nature of our bridged landscape.

If locks and dams changed the river edges, so did the pressure of development on the flood plains. Businesses used fill from land excavations to extend river edges into the water and close narrow channels to islands. They built hard-edged wood and concrete bulkheads to prevent erosion of riverbanks, and constructed large, round terminals for tying up boats and barges. Until the late-20th century, shipwrecked and abandoned barges littered the river edges, sharing space sometimes with residential shanty boats. Launch ramps, docks, marinas, large cranes extending over the water, and storm water and sewer pipes poking through the banks all added to the man-made river landscape.

The once-natural environment of the rivers also became a man-made one.
The traditional vegetation, at least at the time of settlement by Euro-Americans, disappeared over the years. Banks were denuded of trees or sprouted a scrub growth. Pollution from storm run-off, sewage, industrial waste, heating from industrial waste water, and acidic drainage from coal mines degraded water quality and killed off many species of river life. The recent collapse of industry located along the rivers, decrease in mining, and increase of waste treatment facilities have led to the revival of both river plant and animal communities, though precise differences from early communities are not entirely clear.

While we eagerly return to the rivers for aesthetic and recreational purposes, enthralled by the “natural” environment in our midst, we must recognize that the river landscape of the Pittsburgh metropolitan region is not especially “natural.” It is truly a man-made landscape from the water flow and quality to composition of flora and fauna and the built structures that line the banks and flood plains, intrude in the water, and ply the surfaces.

Hills and Valleys

Once away from the rivers, Pittsburghers still faced daunting challenges in developing southwestern Pennsylvania. Described by early travelers and settlers as richly forested, the region soon succumbed to the needs and priorities of a bustling city. The initial landscape alterations, as in most North American frontiers, involved removing trees to carve out roads, fields, and home sites, and to obtain fuel and building materials. The smoke and air pollution from industrial processes, for which Pittsburgh became infamous, also killed, or stunted, vegetation. By the end of the 19th century, a full tree cover no longer graced many hillsides. Mud, rock, scrub vegetation, and eroded gullies affronted the eye while billboards advertised the products of local manufacturers and merchants.

The hills also played a role in the pervasive smoke pollution for which Pittsburgh became infamous. The burning of wood and coal for heat and energy filled the skies of the city, and the configuration of the hills forming a bowl around the downtown area held in the smoke, especially during high pressure atmospheric conditions. Urban growth, steam railroads, and the iron and steel industry increased the volume of smoke, particulates, and toxic chemicals in the air. Darkened building surfaces, especially those of porous stone, became part of the Pittsburgh landscape. The combination of Pittsburgh’s dense smoke pollution, blackened surfaces, and the many bare and scarred hills presented a drab and depressing aspect about which travelers and journalists routinely and pejoratively commented.

In the first decade of the 20th century, reform groups such as the Civic Club of Allegheny County, as well as the Chamber of Commerce, initiated efforts to remedy the smoke and deforestation problems. Smoke abatement laws were passed, and a Shade Tree Commission established. Still, smoke continued to blanket the region until the 1940s, when the enforcement of smoke control laws and the shift to natural gas cleared the skies. The city’s Shade Tree Commission labored for several decades, operating a nursery and planting thousands of trees. Today, the verdant hillsides that enhance the landscape reflect either the direct intervention in reforestation or the flora’s regenerative ability once cutting and air pollution abated.

The hills were also obstacles to movement. The dramatic and emblematic means to overcome some hills were to lay very steep roads straight up them, traverse them on an angle, or cut a switchback loop into them. Some streets on the map became nothing but a long series of stairs, or ended in stairs. In the 1870s, private companies built inclines up the hills. Breathtakingly steep roads, stair streets, and inclines all remain part of Pittsburgh’s landscape,
but with improved earth-moving equipment, cuts through or on the sides of hills became more common ways to build roads.

The most expensive cuts were tunnels for both vehicles and railroads. Even before these tunnels, one was driven through the back end of downtown to connect the Pennsylvania Main Line Canal terminal basin (between Tenth and Eleventh streets, and Penn and Liberty avenues) with the Monongahela River wharf. More commonly, cuts that lopped off part of a hill or ran across the face of hills exposed unstable geological strata, risking landslides and soil slumps. Huge retaining walls made of railroad ties, stone, cement, and other materials flank railroads and highways and hold back the hillsides. Most walls cause little notice, but the large scale and textures of some, such as the stone wall along Browns Hill Road on the north end of the Homestead High Level Bridge, are quite dramatic and aesthetically attractive.

The hill and valley topography channeled development, too. Flood plains and the relatively flat tops of the hills were the easiest to build on, but significant alterations of topography began with the relatively simple technology of blasting small hills and carting away the debris, often to fill in shallow ravines. Twentieth century earth moving techniques allowed the massive flattening of hilltops and filling of ravines to build suburban subdivisions. The dumping of slag waste from the iron and steel mills not only filled ravines but perversely were piled up into huge hills. Today, some slag landscapes — which were spectacles at night when fresh, hot slag was dumped — have become sites for shopping centers such as Century III Mall and the upscale residential development of Summerset in the Park on the slag pile in Nine Mile Run.

Most altered areas are no longer recognized as such. One of the more famous alterations was the filling of St. Pierre Ravine, burying the extant Bellefield Bridge, in front of the Carnegie Library circa 1913. Another was the 1912 removal of a small hill, called the "hump," to level Grant Street and facilitate the movement of traffic. That forced the ground floors of the Allegheny County Courthouse and Frick Building across the street to be reconfigured, creating awkward appearances and entrances that remain today.

Homeowners with fewer resources at hand often built split-level houses that seemed to be draped on the hillsides. Two- or three-story fronts became four- and five-story backs, while the outdoor back yards ran down the slopes even further, sometimes as terraces. Houses tucked into hillsides, clinging to the hills, or near the bottoms faced shifting and sliding soil and mud. House foundations were at risk, and wet basements were, and still are, common. Homeowners built retaining walls to protect back yards, driveways, and stairs cut into the hills. The constant sliding of water and subsurface strata downhill causes the walls to crack, lean, and collapse. In his trademark style, nationally renowned Baltimore newspaperman H.L. Mencken wrote in 1927 that "By the hundreds and thousands these abominable houses cover the bare hillsides, like gravestones in some gigantic and decaying cemetery.... On their deep sides they bury themselves swinishly in the mud. Not a fifth of them are perpendicular. They lean this way and that, hanging on to their bases precariously."

More to discover ...

Coal mining throughout the region created its own distinctive landscape. Tall coal tipples, lower power houses and other out buildings, small railroad yards, culm piles of coal dust and debris, and in many cases — particularly in southeastern parts of the region — banks of adjacent coke ovens signified a mine. Nearby rows of identical double houses and a large company store formed the "patch" community of miners and their families.

Below the surface, mines extended for miles, creating an underground landscape unlike anything above the surface. Over the years, this subsurface landscape made its presence felt through subsidence that opened cracks and pits (current longwall mining
techniques have increased the damage of subsidence) and through acidic water seeping into nearby streams, which ruined machinery using the water and killed aquatic life.

The adaptations and persistence of interactions between Pittsburghers and their environment as we settled, used, and re-used the region have created a number of features that also stamp this a distinctive metropolitan landscape. From the broad-scale locational pattern of settlement along the rivers, engineering of the rivers, and recontouring the hills and valleys to the locks, dams, bridges, and bulkheads or to the stair-streets, inclines, retaining walls, tunnels, and numerous other features that dot the region, the Pittsburgh landscape delights the eye (though it did not always do so) and stirs the imagination. It is a landscape begging to be observed and read, worth preserving, and altering only after careful contemplation of consequences.

Change is both inevitable and appropriate, but change should be culturally consistent and sensitive to tradition and the environment. We should retain what is distinctive and avoid the temptation to become like so many other places through the proliferation of national, corporate, and usually commercial landscape identities. The landscape of Pittsburgh, and the entire region, is most worthy of study, preservation, and pride.

Edward K. Muller is a Professor of History and Director of the Urban Studies Program at the University of Pittsburgh.