The Poor on the Hilltops? The Vertical Fringe of a Late Nineteenth-Century American City

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Features of the physical urban site merit more attention than they have traditionally received in models of city form, but in bestowing it the interrelation of social and natural features must be recognized and a neoenvironmental determinism avoided that would see the roles played by site features as always and everywhere the same. In American cities today, the affluence of residents, as a rule, increases with elevation. Yet in the "walking city" of the nineteenth century and earlier, high land's difficulty of access might have outweighed its attractions and made it the home of the poor and not the rich. The possibility is investigated through a study of upland residential patterns in Worcester, Massachusetts, in 1891, just before the city's first electric trolley line was installed. Though a simple inversion of today's pattern did not appear, working-class residents indeed predominated on the highest land. They shared it with pockets of upper-class estates and with other land uses—such as parks, large residential institutions, and extractive and nuisance industries—typically associated with the premorden horizontal urban fringe and apparently drawn to the vertical fringe as well by the cheapness of land. Key Words: site, situation, terrain, urban geography, Worcester.

"The notion of nature in cities ... has conventionally been perceived as an oxymoron," wrote Hough (1994, 40). A recent surge in research challenging this perception takes many forms and derives from many sources. It stems, among other sources, from natural scientists, increasingly aware that many biophysical processes can no longer be understood without taking into account the pervasive influence of urban settlement (e.g., Grimm et al. 2000); from such political initiatives as the urban environmental justice, ecological restoration, and community anti-toxics movements; from the emerging field of sustainability studies, conscious of the dominant role that cities will play in the global future; from philosophical shifts that have made geographers and others suspicious of such sharp dichotomies as natural-cultural, urban-rural, or urban-wilderness (e.g., Cronon 1991, 1995; Wolch, Pincetl, and Pulido 2002); and from the example set by those individual scholars who studied the environment before the topic became a popular one (e.g., Blake 1956; Wolman 1967; Berry and Horton 1974; Landsberg 1981; Douglas 1983).

Urbanization, it is now generally recognized, does not so much obliterate the natural environment as alter or transform it into a new state that is both the joint product of biophysical and social processes and the arena for their continuing interactions. These processes, past and present, are now being investigated by geographers, historians, and both social and natural scientists much more actively than ever before in a wide range of past and present settings. Colten (2002), for example, explores the complex and evolving relations of natural setting, engineering projects, and racial and economic categories as they shaped residential patterns and exposure to hazards in late nineteenth and early twentieth century New Orleans. Gandy's (2002) Concrete and Clay displays the intricate intertwining of the physical and social realms in the production of a distinctive "metropolitan nature" in both New York City and the farflung hinterland affected by its activities. Freidberg (2001), in a West African setting, restores both agriculture and political-ecological issues to the urban setting from which they are often presumed to be absent. Such studies and many others (e.g., Davis 1998; Gumprecht 1999; Melosi 2000; Tarr 2000; Heynen 2003) present a compelling case for reintegrating the subject matters of human and physical geography (Hanson 1999).

They have yet, to influence appreciably the overall direction of research in the subfield to which they are perhaps most relevant. A recent agenda-setting statement for future research in urban geography avoids any serious or sustained engagement with the environmental dimension and indeed almost any mention of it (Aitken, Mitchell, and Staehehi 2003). To date, it has been brought in chiefly as a supplemental factor to traditional urban-geographic themes (Hanson 2003), and only spottily and unevenly at that, as witness one of the most time-honored themes in the subdiscipline, the modeling of urban form. The longstanding exclusion of the physical urban site from the chief theories of city structure noted by Palm (1990) has still not been remedied.
A particular obstacle to such reintegration of the social and the natural everywhere in geography, apart from the barriers that hamper all boundary-crossing studies, has been the stigma attached to the legacy of environmental determinism. It is less of an obstacle when the topic at hand is the human transformation of the biophysical world than when it is the role or agency of nature in affecting human activities. But to suggest that urban site factors that are not remade by their inhabitants constrain and shape cities and that they be paid some systematic attention is by no means to propose a return to environmental determinism. It is simply to acknowledge the reality that within any particular kind of urban society, patterns of physical geography can matter a great deal for patterns of human activity. But whether and how they matter, environmental determinism to the contrary, always depends on the characteristics of the society with which they interact and will change as these do. As Blanchard (1922) long ago observed, the same urban site features could be assets in one period or setting, meaningless in another, and liabilities in a third. Here the perspectives of environmental history and historical geography are particularly important in illustrating the point in abundant and concrete detail. An exemplary case is Muller's (2003) account of the differing successive roles played by the same physical features—the rivers—in different stages of the history of Pittsburgh.

The role of relief or terrain in urban land-use patterns offers another case in point. Among theorists of urban form, the supposed discontinuity between cities and nature has long been codified in the standard urban modeling assumption of a flat featureless plain. The assumption is a patently unrealistic one. "Few cities are located on anything like the featureless isotropic plain of the theoretical models" (Main and Williams 1994, 153). If terrain does matter, its significance can never be illuminated by such an approach. But its significance may also be distorted or obscured by the assumption that the same features should always and everywhere matter in the way they do here and now. The one approach ignores the third or vertical dimension of the cityscape, the other the fourth dimension, that of time, and they are equally fatal to a rounded understanding. If the former failing is the predominant one in the literature, the latter is apparent in the most notable attempt that has yet been made to incorporate relief into models of city form.

Terrain and Residential Land Use

It seems today to be generally acknowledged, when the matter is considered at all, that the highest residential areas in American cities will be occupied by the wealthy. Ernest W. Burgess (1929, 119) remarked upon the pattern in the same decade in which he put forward his well-known concentric-zone model of urban form. In "hills cities" with a substantial degree of relief, he proposed, terrain, rather than distance from the center, will be the dominant factor in residential differentiation. Not a concentric, but an altitudinal zonation will obtain, with "the poor in the valleys, the well-to-do on the hillsides, and the rich on the hilltops" (Burgess 1929, 119). The other classical theorists of urban form—Homer Hoyt in 1939 and Chauncy Harris and Edward Ullman in 1945—said much the same in their own ways (Meyer 2000). All invoked the presumed superior amenities of higher land to explain the pattern. The assertion in any of these forms has inspired little research, but it has received passing mention and strong support in a number of articles (see Meyer 1994).

The architect and city planner Hans Blumenfeld (1948) also maintained that the importance of environmental amenities caused altitude and affluence to coincide in the twentieth-century city. Going beyond Burgess, however, he elsewhere proposed that the tendency was a product of particular modern conditions that had not obtained throughout urban history. As he wrote, "Most often the pattern appears to be of recent origin. In Paris, for instance, the influence of a reverse older pattern is still noticeable, with the aristocratic Faubourgs St. Germain and St. Honoré located in the valley and the working-class slums of Belleville and Ménilmontant on the heights" (Blumenfeld 1959, 62–63).

Though Blumenfeld did not elaborate the point, his meaning is clear enough. The "reverse older pattern" to which he alluded could only have been one in which status and wealth had decreased with elevation as they increase. One can, then, speak of a "Blumenfeld model" bearing the same relation to Burgess's altitudinal-zone model as the classic pattern of the premodern city, with status declining from the center to the margins, is so often said to bear to Burgess's concentric zones in the modern city. One describes distributions in vertical space, the other in horizontal. A shift from the earlier to the later pattern in each case can be explained in terms of the bid-rent model (Alonso 1960), with its assumption that accessibility to the urban center, assumed to be the focus of activity, determines land value and, through it, land use. It can, at the same time, be accounted for in terms of the declining influence on land use of situation and rising importance of site, as proposed by Ullman (1962) and Webber (1963). The bid-rent model and the concepts of site and situation are usually
employed only to address patterns in horizontal space. If they are valid, though, they must also apply to the vertical sorting of activities. The friction of distance and the force of gravity both make lands far outward or far upward from the center difficult to reach. Extra effort is thus needed to commute from high as well as from remote locations. In the walking city of the nineteenth century and earlier, transportation was slow and costly. Situation must have been of paramount importance in location. Business, able to outbid other users for prime lots, would have claimed not only the center but the low ground as well, for “steep hills . . . interfered with the flow of street traffic and impeded the delivery of goods by horse-drawn vehicles” (Rosen 1986, 81). The more-difficult, less-favored lands would have been left for residence, and the least favored of them—the distant periphery and the highest urban hilltops—would most likely have been occupied by poor and marginal populations.

New means of transportation greatly reduced the difficulties and disadvantages of situation. The first of them, the horse-car and the steam railroad, were both much less efficient at lessening the difficulties of climbing slopes than they were at promoting outward movement in horizontal space. In a few American cities of extreme terrain, such as Cincinnati, Pittsburgh, and San Francisco, funicular railways and cable cars opened a handful of hilltops and hillslopes to easy commuting well before the end of the nineteenth century. Elsewhere, though, it would only have been the electric trolley, first appearing in the late 1880s, and then the automobile, that tackled steep grades with ease and made the heights as accessible as the periphery. Thereafter, the amenities of each could exert far more of an attraction than before. Peripheral land and elevated land share a general appeal of site as well as a general difficulty of situation. The periphery’s advantages for residence, as enumerated by Ullman (1962, 17–18), include freedom from “smoke, noise, traffic, crime, and other well-known attributes of crowding,” as well as an abundance of cheap, open lands for development unhampered by previous use or subdivision. Those of high land, as catalogued by Blumenfeld (1948), include the attractions of a view, agreeable microclimatic conditions, and the absence of the disamenities associated with main transportation routes, industry, and lower-class residences, all tending to locate together on lower ground. Elevation is arguably the best single index to urban environmental amenities and site attractiveness if distance from the center is held constant. Only the presence of a lake, ocean, or riverfront—low in elevation but offering many of the same advantages as high ground if not occupied for industry or transportation—is likely to distort the pattern somewhat by adding a second narrow zone, rich in amenities, along the water’s edge. Otherwise, to the degree that amenities control residential choice, high-class settlement and elevation should now be closely and positively correlated. That choice is now largely controlled by amenities, the one-time dominance of situation having given way to that of site, has been plausibly maintained by Ullman (1962) and Webber (1963).

Homer Hoyt’s sector model, generally taken as the single best key to the sorting of income groups in the modern city, can be interpreted in the same terms of situation and site (Meyer 2000). In its original form, it emphasized the dominance of the former. The well-to-do, Hoyt correctly observed, had long favored the main roads, which offered prime locations for access and also for display. It was chiefly their tendency to settle along one or more of these avenues running outward from the center that created a sectoral pattern of elite and poorer residences (Hoyt 1939; see Meyer 2000). Yet Hoyt also acknowledged that the pattern was being destroyed even as he wrote. The site disamenities of heavy automobile traffic were starting to outweigh the situation advantages of frontage on the main streets, while automobile use also reduced the disadvantages of more retired locations.

A few years later, in a statement to which later exponents of his work have paid little attention, Hoyt declared outright that his model should no longer hold true and that some new model of city form would have to be found for an era of mass automobile ownership (Hoyt 1947). If a sectoral pattern of affluence and poverty still does obtain, as seems indeed to be the case (Berry and Kasarda 1977), it must be for reasons other than those that Hoyt proposed, and they are not very far to seek. A tendency for high-income areas to avoid, instead of prefer, the high-volume traffic corridors and for the poor to force to settle along them would still generate a sectoral distribution: simply the mirror image of the one formerly produced.

But though attractively neat, these models are all drastic simplifications of reality, and other considerations complicate matters substantially in practice. The concentric-zone and bid-rent models disregard, for instance, the existence of some high-class mansions and enclaves on the fringe even of premodern cities, the persistence into the present of high-income central apartment districts, the widespread nineteenth-century phenomenon of peripheral, rather than core industrialization and worker housing (Harris 1998), and all cases in which market mechanisms do not play the dominant role in assigning uses to land. In vertical space too, accessibility
has never been the sole factor in housing patterns. Some site considerations, ranging from defense to the real or supposed unhealthiness of low-lying and poorly drained land to the severe disamenities arising from its occupation for commerce and industry, might often have outweighed the factor of situation long before the arrival of the trolley and the automobile. A modest degree of elevation may often, even usually, have been an attraction to high-class residents. It seems likely, nevertheless, that before the end of the nineteenth century, more than moderately high land in American cities, like land on the periphery or distant from main avenues of travel, would often have been occupied by the poor, whereas today it would not be.

Where the vertical dimension is concerned, the historian John Alexander Williams has described two such contrasting stages of occupancy in the extreme terrain of the urban areas of West Virginia, ideal cases of the "hills cities" where Burgess expected his altitudinal-zone model to work best. In the nineteenth century, Williams wrote, "the most valuable level land tended to be occupied by the most affluent people... in the cities as well as in the agricultural districts," while the poor lived on the steep hillsides. "The reason was simple. Men who could afford a choice preferred to walk to their downtown places of business or at least to avoid the hazards and inconveniences that beset pedestrians, horses, and streetcars in hilly terrain." Those who could not afford a choice were obliged to settle on the more difficult land higher up that was left over. "The automobile," Williams added, "changed all this." It allowed the well-to-do to live without excessive difficulty in new residential suburbs that early in the twentieth century began for the first time to rise above "the old hillside slums" on the high ground (Williams 1976, 175–77).

A possible outcome of such a history is a pattern in which neighborhoods established under one set of circumstances survive today amid ones established under another. Watson (1959) called attention to the importance in cities of such "relic areas," whose origins must be sought in historical rather than contemporary factors (a theme also adumbrated in Firey's [1947] discussion of persisting high-status areas in central Boston). The bidrent model supposes that patterns will adjust themselves perfectly and instantaneously through market transactions to changes in preferences, but this assumption too is not wholly realistic. Urban areas with a long history of development are likely to have inherited many patterns that forces now dominant would not produce. Some such survivals may stand out as anomalies in the present-day association between altitude and affluence. Lower-class areas that were established on elevated land before the end of the nineteenth century are likely, short of massive and wholesale redevelopment, to have persisted as such. Upper-class areas that were established on low land in the same period may have done the same. Or they may, after a period of decline, sooner or later undergo redevelopment that takes advantage of attractive and historic architecture and street plans and the appeal of a once-prestigious neighborhood name. The upgrading of previously settled areas in closer accord with present-day imperatives is likely to be favored by the presence of such natural amenities as elevation and views (Clary 1979). It may, however, be blocked or long delayed by such entrenched obstacles as incongruous lot and house sizes, the age, style, and equipment of existing buildings, street layout, and neighborhood character and reputation. Thus, powerful trends now at work may mistakenly be seen as less powerful than they really are because fossil patterns inconsistent with them have survived. Such legacies from earlier times may lessen the apparent relevance today of the Burgess altitudinal-zone model but in fact say little against its contemporary validity.

It is, then, a question of more than historical interest whether American cities as recently as the late nineteenth century did display the pattern of vertical stratification suggested by Blumenfeld, or some variant of it. A good test case would be that of a city having the following characteristics: It should have been founded early enough in American history to have developed to a substantial size during the horse-and-foot era of transportation. It should have had extensive areas of both low and high land and of both level and steep terrain. Finally, it should also have lacked a sizeable ocean, lake, or riverfront, amenity-seeking settlement along which might dilute the effects of elevation.

One of the American cities best meeting these criteria, Worcester, Massachusetts, is examined here. First permanently settled in the early eighteenth century, Worcester has a comparatively long history of urban development for North America. It was incorporated in 1848 and has ranked as the second largest city in Massachusetts since the latter part of the nineteenth century. It possesses the requisite degree of relief in the land surface to qualify as a "hills city" in Burgess's sense. It also has a possible disturbing factor in the long shoreline of Lake Quinsigamond, a narrow sheet of water on the eastern city boundary. The lakeshore, however, did not become part of the continuous urban area or much affect patterns of residence before the early twentieth century, though a small detached suburb, Lake View, developed there after the Civil War and was connected by steam rail service to the central city.
Altitude and Residence in Worcester, 1891

For present purposes, the best time at which to assess the relations of terrain and residence in Worcester is on the very eve of the arrival of the electric trolley, the first means by which steep slopes and high elevations were made readily accessible to large numbers of people. The Worcester City Directory (arranged alphabetically) and the Worcester House Directory (arranged by street) for 1892 record the names, addresses, and occupations of heads of households in May 1891, only a few months before the first trolley line began to operate (Drew, Allis & Company 1892a, b). Supplemented by other sources, they make it possible to describe the residential form of the city at the time of its fullest development on the basis only of foot, horse, and steam power.³

Worcester in 1891 was a thriving and diversified industrial center and home to some 85,000 people. It was a considerably overbounded city, whose political limits included several detached peripheral settlements and a good deal of farmland. The great bulk of its population lived within a core area defined by the street map published in the city directories (Figure 1). Its approximate center throughout its history, the intersection of Main and Front Streets at the northwest corner of the Common, stands at an elevation of 147 m (481 ft) above sea level (Nelson 1920). Gently sloping lowlands extend to the southeast and the north, and a moderately steep

![Figure 1. Streets and principal features of central Worcester, 1891. Street pattern redrawn from Drew, Allis & Company (1892a).](image-url)
ridge rises on the near west side, with much higher elevations occurring somewhat farther to the east and south (Figure 2). The lowest land within the city boundaries, at about 112 m (360 ft) above sea level, is on the shores of Lake Quinsigamond. The highest is found well to the north and west of the center in an area not reached by the expansion of the settled core until well into the twentieth century.

The lowest residential areas of the late nineteenth-century city core, those near or below the elevation of the center, were overwhelmingly working class. Lake View—a middle-class rather than an upper-class area, and in any case not contiguous to the main settled area, though it was included in the directory maps—was the single important exception. Most Worcesterites with high-status occupations lived at moderate elevations up to 30 m (about 100 ft) above the city center. The city's elite clustered particularly in two neighborhoods within this zone: the near West Side and a smaller district lying on both sides of South Main Street near Woodland Street (Weiss 1973), both at altitudes from about 152 to 170 m (500 to 560 ft). Street construction, settlement, and development avoided most of the high and steep land, preferring to extend outward along easier terrain (Figure 2). But of the five most elevated neighborhoods of the time, the ones extending more than 30 m above the city center (Figure 3), three, including the highest of all, upper Belmont Street, were exclusively or over-

Figure 2. Streets and elevations in central Worcester, 1891. Street pattern redrawn from Drew, Allis & Company (1892a).
whelmingly working-class in population and were viewed by the well-to-do as slums. The other two consisted of small elite areas or scattered estates surrounded and in places mingled with working-class settlement. A more detailed description of these five neighborhoods, based on a complete enumeration of their residents in the directories, provides insight into the character of the Worcester highlands of the time.

Fairmount. The peak of this small, steep drumlin, at 189 m (620 ft), rises more than 30 m above the flats ringing its base. About 2.5 km north of the Common, the hill lay vacant until the late 1840s. It was then acquired by a developer, David S. Messinger, who gave it its name and laid it out in lots and streets whose literary names suggested the cultivated residents he hoped to attract (Worcester Evening Gazette 1888). It was also often called Messinger or sometimes "Messenger" Hill. But it chiefly attracted workingmen, many of them (as were many on Millstone and Chandler hills) from the large North End wire factory of the Washburn and Moen Company. Almost all of the hill's three dozen heads of households in 1891 were listed in the directories as factory wireworkers or unskilled laborers. Fairmount in this period was said to be one of several localities in the city exhibiting "real poverty in all its most exaggerated
forms” (Worcester Sunday Telegram 1885), as well as frequent violence, disorder, illegal liquor sales, and police raids (e.g., Worcester Sunday Telegram 1888a, b; Worcester Telegram 1889a, 1890a, b, 1891a, 1893b). The hill’s single anomalous residence in 1891 was that of a small businessman, H. M. Couture—a house with a fine view, plus outbuildings and grounds. It was soon to disappear in an incident reflecting the acute hazards as well as the everyday inconveniences of life on high ground. The house and outbuildings caught fire during a roaring blizzard in February 1893 and were destroyed before the city’s horse-drawn firefighting equipment could force its way up the steep, heavily drifted slope (Worcester Telegram 1893a). Subsequent directories record that Couture, instead of rebuilding, moved to a lower elevation on the fringe of the well-to-do Main South neighborhood.

Upper Belmont Street. Another of Worcester’s highest residential areas ran both north and south of Belmont Street as it climbed the heights east-northeast of the city center. The streets to the north, such as Rodney, Everard, and parts of Catherine Street and Eastern Avenue, rose up the slope of Millstone Hill. Those south of Belmont climbed Bell or Chandler Hill. Still higher on Millstone Hill was a settlement of laborers employed in its quarries. The entire area, including upper Belmont Street itself, had few wage earners listed among its 200-odd households other than laborers and factory workers. This upland had “the reputation of being one of the ‘tough’ districts of the city” (Worcester Sunday Telegram 1889c). Bell Pond, though a reservoir for the city’s water system, shared in the general character of the area. “Dogs and cats are drowned in the water, the boys bathe in it and tramps do their washing on its shores” (Worcester Telegram 1889c).

Oak Hill. The high land southeast of the city center has gone by a number of different names in the course of Worcester’s history, including Oak, Dungarven, Sagatabscot, Dutch, and French Hill. In 1891, its solidly working-class population included an Irish district, concentrated on the lower slopes. Above it was a predominantly French Canadian area of about 150 households, occupying such streets as Orient, Thorn, Ascension, Shale, and Bleeker; at elevations reaching almost 213 m (700 ft). The entire hill was “well known in police circles” (Rice 1889, 23). It was regarded as a “hot-bed of drunkenness and rum fights” (Worcester Sunday Telegram 1891; Meagher 2001, 62). Infested by gangs (Worcester Telegram 1891b, c), and equally as a fringe district notably ill-provided with such city services as street paving and police protection (Worcester Telegram 1889b).

Mount Vernon. A small area of concentrated upper-class settlement in late nineteenth-century Worcester extended from upper Lincoln Street north-northeast of the city center up the streets—including Catherine, Windsor, Mount Vernon, Harrington Avenue, and Channing—on the higher ground to the east (Weiss 1973; Taylor 1984). It differed from the city’s two largest elite neighborhoods—the near West Side and South Main Street—both in the smaller number and in the greater size and splendor of its estates (Worcester Telegram 1889a). Its residents included the prominent attorney and longtime U.S. Senator George F. Hoar, the industrialist and mayor Charles G. Reed, and Austin P. Crissy, editor of the Worcester Telegram. Further to the east and higher still lay Worcester’s single most magnificent estate, Green Hill. Its 1,100 acres were adorned by elaborate landscaping, a palatial mansion in the style of a large French chateau enjoying spectacular views over the city, and an artificial lake plied by a small steam yacht (Worcester Sunday Telegram 1889a; Worcester Evening Gazette 1892). The Mount Vernon upland, however, was not exclusively the home of the well-to-do, but also included several areas of lower-status settlement at equal or higher elevations. It was bounded to the south by the working-class Millstone Hill district. The lower reaches of Green Lane, the most elevated road in the area and the only one leading to Green Hill, belonged to high-status households, but the higher ones to working-class residents, chiefly laborers and teamsters.

Union Hill. Only this upland south of the city center rivaled Mount Vernon as a setting for impressive upper-class estates (Worcester Sunday Telegram 1889a). It had even fewer of them, though, and they were in even closer quarters to the homes of the other, and far more numerous, working-class occupants of the same area (Weiss 1973). The largest, second only to Green Hill in magnificence, was “Mariemont,” home of the carpet manufacturer George Crompton (Crompton 1952). Outside their confines, Union Hill was a byword for poverty, disorder, fights, and youth gangs (Worcester Sunday Telegram 1888c). Its back lanes were considered “lurking corners for filth and vice” (Worcester Spy 1887), and its central thoroughfare, Providence Street, which ran southward over the summit of the hill, pestered out in an upland quarter of dubious reputation known popularly as Lover’s Lane (Worcester Evening Gazette 1891).

The highest area of substantial settlement within the city limits was also very far from being an elite district. Much of the neighborhood of Valley Falls lay more than 213 m (700 ft) above sea level, and the highest parts exceeded 244 m (800 ft). It was located on the city's
western margin and merged across the line into the larger village of Cherry Valley in the town of Leicester. Both settlements were based on textile mills that exploited the fall of Kettle Brook to run their machinery. They were examples of a fast-declining type of settlement, the peripheral industrial village drawn to high and steep rather than low and level ground by the single factor of abundant direct-drive waterpower. The shift to steam power had devalued their chief asset, and the streams on which they relied were increasingly being taken for municipal water supplies, as Kettle Brook would be not many years later. Both Valley Falls and Cherry Valley were inhabited chiefly by workers in the textile mills, seasoned with a few mill officials, and, on the fringes, farmers as well. Valley Falls was considered a shady and turbulent area. Its location on a political boundary made it a particularly favored scene for disorderly illegal amusements. A high hill bisected by the city line was notorious for recurrent "rumselling, raids, scraps and cockfights" (Worcester Telegram 1893c).

The Vertical Fringe of Late Nineteenth-Century Worcester

Burgess’s proposed pattern of “the poor in the valleys . . . the rich on the hilltops,” then, did not hold entirely true in late nineteenth-century Worcester. But the rich did not all live on low or level ground and the poor above them; a simple inversion of the Burgess model did not hold true either. There is a pattern to be seen, all the same, and another model is needed to capture it. Residential land use in Worcester departed from the Burgess model chiefly in the presence of much lower-class settlement, mingled with strikingly affluent residences, on areas of high ground. Not only in this, but in much else as well, the city’s upper reaches displayed a pattern that can be dubbed the vertical urban fringe, by analogy to the well-known phenomenon of the premodern urban fringe in horizontal space. Its residential occupancy consisted of scattered settlements of the poor and marginal on the one hand and the estates of the well-to-do on the other (Swauger 1978; Jackson 1985, 15–19). Its other characteristic land uses were “noxious industries, dumps, prisons and similar institutions, cemeteries, and other land-intensive, city-related but often city-rejected phenomena” (Binford 1985, 6). Such activities could not obtain the space they needed close to the urban center and had to accept inconveniently distant locations. The similar land uses of the vertical fringe made the same exchange of convenience for cheapness. They took sites that required extra effort in climbing hills and that were, for that reason, easier to obtain than ones on the more convenient and desirable, and hence more costly, urban lowlands.4

Residential quarters of large public or charitable institutions represented one such use, common enough on the nineteenth-century American urban fringe (Rothman 1971, 141–42). The numerical predominance of lower-class dwellings on high land in Worcester in 1891 was reinforced by the presence of another population residing in the uplands but not recorded in the city directories: the more or less destitute inmates of several public institutions. On the southeastern slope of Millstone Hill, at 186 m (610 ft) above sea level, stood the Worcester State Hospital for the insane, by far the largest residential institution in the city. It had opened in the late 1870s and was chiefly a long-term custodial facility. Most of its 800-plus inmates in May of 1891 were supported at public expense (Commonwealth of Massachusetts 1892); most wealthy patients in this period were cared for at home or in private facilities (Grob 1966). A large working-class staff of laborers and attendants also boarded at the hospital. Worcester’s largest private charitable home, a Catholic orphanage, housed 150 children in a building in the upper part of Oak Hill (Worcester Telegram 1894). Under construction at this time was an old-age home for impoverished members of the Odd Fellows fraternal order, with room for a hundred inmates, on a donated upland site north-northwest of downtown (Knowlton and Gibson-Quigley 1996, 218).

Regrettably, each of the city’s other residential institutions also occupied elevated sites. The original Worcester State Hospital building on Summer Street had been on both the vertical and the horizontal fringe of the much smaller Worcester of the 1830s when it was opened. Converted into a branch center after the completion of the new facility, it held just over 400 patients in 1891 (Commonwealth of Massachusetts 1892). Worcester City Hospital was erected in the early 1880s on a donated site on a West-Side hill. The buildings of the College of the Holy Cross (founded in the 1840s) and Worcester Polytechnic Institute (1865) stood on a hillside and a hilltop campus, respectively; those of the Worcester State Normal School, opened in 1874, the 183-m (600-ft) summit of Normal Hill on the East Side. The city’s three major private boarding schools—Oread Academy, the Worcester Military Academy, and Worcester Academy—all occupied hilltop sites (Rice 1889; Nett 1919). The campus of Worcester Academy, located high on Union Hill near the Crompton estate, had previously been used in succession by three short-lived institutions: a medical school, a women’s college, and a Civil War soldiers’ hospital (Rice 1889). Such institutions, characteristic
occupants of the horizontal fringe, would have had no less reason to seek upland sites as well.

The city almshouse, on the other hand, was located on some of Worcester's lowest-lying land, near the city limits in the northeast where Poor Farm Brook flowed into Lake Quinsigamond. Its inmates in May 1891 numbered about 200. Because the city used a large piggery on the poor farm for municipal garbage disposal, the site had to be easily accessible to teams hauling large loads; a hilltop or hillside location was not a practical possibility. It occupied, all the same, a location on the horizontal fringe and, in a sense, on the (lower) vertical one as well: more than 100 ft below the city center.

The vertical fringe of the nineteenth-century city shared still other characteristic denizens with the horizontal. Nuisance industries and places of illicit recreation found a haven in these thinly settled districts; so did parks and cemeteries with their high requirements for acreage. In Worcester, the nuisance trades of rendering animal carcasses (two of three establishments listed in the directories) and brick making were both concentrated on Dungarven Hill. That of quarrying had once been active on Goat Hill, the site of Oread Academy, and was still carried on atop Millstone Hill. Several upland areas, such as Dungarven Hill and the Valley Falls-Cherry Valley borderland, were among the city's most notorious centers of illegal drinking, gambling, prizefighting, and cockfighting.

High land in Worcester also furnished more than its share of public park space, but not necessarily as one might suppose today, because of the attractions of its views and scenery. The unevenness and difficulty of hilly land made it much less than ideal for public recreation in the nineteenth century, particularly for the baseball and other active games favored by working-class citizens, who needed municipal open spaces much more than the well-to-do did (Rosenzweig 1983). Yet the same physical characteristics that made hills unsuitable for industry, commerce, major roads or railroads, or dense residential development meant that they could be cheaply and easily obtained for park use. Just as land was set aside for national parks in the nineteenth-century United States only if could be shown to be worthless for the productive activities of farming and mining (Runte 1979), for urban parks too "in practice the sites selected were simply those for which there was no competition at all, those usable for other purposes" (Cranz 1982, 29). If such lands had occupants, they were typically marginal squatter settlers or nuisance industries that could easily be displaced and whose very presence testified to the lack of demand for such sites. As the Worcester parks commission completed a program of land acquisition begun in 1886, even an upper-class newspaper expressed the wish that it "had not run quite so much to hill. If they ever put sheep into the Parks, they will have to be the kind with two short legs on one side and two long legs on the other, built for standing on steep declivities" (Worcester Evening Gazette 1889). When Newton Hill, a drumlin on the West Side, was made part of the system, one city councilor who opposed the acquisition sarcastically proposed adding, as an essential improvement, "an elevator, so the public can climb up and appreciate it" (Worcester Telegram 1888).

In nineteenth-century American cities, large cemeteries were among the major land uses most often found on high, hilly land, which offered advantages ranging from well-drained soils to the symbolic appropriateness of a site lofty and close to heaven. The landscape ideal of the nineteenth-century rural cemetery included broken and varied terrain and an abundance of views within the tract and over the city below. Yet several scholars have rightly warned against the assumption that cemeteries tend to occupy high ground merely for these reasons and no others (Francavaglia 1971, 505; Hannon 1989, 245–47). They point out that such land was of relatively little value for farming and for nineteenth-century city expansion. Its resulting cheapness, not its inherent attractions, was what allowed burial as a land use to claim it. The point is borne out by the fact that the association between hills and cemeteries did not hold true in Worcester, its abundance of high land notwithstanding. The city's principal burial grounds in 1891 were all located on low and level sites. They were, however, on or beyond the periphery of the built-up area when they were established (Tymeson 1956, 1961). As this case and others already cited illustrate, the vertical and horizontal fringes were for many purposes interchangeable for the land uses that tended to seek them, having in common the same essential characteristic of being easily and cheaply obtained.

Land Use and Land Value on the Vertical Fringe

What the characteristic occupants of the vertical and horizontal fringes shared with one another was the particular attraction that cheap land would have exercised upon them, combined with their ability and willingness to forego ease of access in return. It remains to be seen whether the land that they sought was in fact cheaper. Did urban space command a markedly lower price as its elevation increased, thus encouraging an influx of poor, marginalized, and/or highly space-demanding uses that
were able for one reason or another to tolerate the inconveniences of such sites?

The ideal concentric pattern of accessibility and, through it, of land value in the bid-rent model is, of course, distorted in practice by the localization of employment centers and of main routes of travel. Two of Worcester's largest factories, the North and South Works of the Washburn and Moen Company, a wire manufacturer, were located not in the city core but at the north and south ends of the densely settled area. Main Street and other principal thoroughfares increased the accessibility of the neighborhoods through which they ran. But the location of both main streets and factories was itself not unrelated to terrain. Both (save, of course, for water-powered industry) avoided the highest ground and the steepest slopes. Those blocks in the 1891 street pattern intersected by a circle 1.6 km (1 mile) in radius from the city center—the intersection of Front and Main Streets—were roughly equal in potential horizontal accessibility from the center and differed chiefly in elevation and its consequences. This circle passed through four of the five chief upland neighborhoods of the early 1890s (upper Belmont Street, Mount Vernon, Oak Hill, and Union Hill) as well as through the lower-lying South Main elite area and through several working-class areas not on high land. It passed as well through some industrial lots, some unoccupied land, and the park space of Newton Hill and East and Crompton Parks.

The 1892 House Directory furnishes land area and land value assessment figures for individual lots (land and buildings were assessed separately in Massachusetts). Thompson (1980) used these data in a study of ethnic neighborhood growth, determining land value per block by aggregating land value assessments for that block and dividing by total area assessed—the procedure followed here to find values for the blocks a mile from the center in the early 1890s. Unoccupied blocks, ones devoted substantially to nonresidential use, and ones that were so large or open-ended that much of their area lay much more or less than a mile from the center have been excluded.

Assessments have the great advantage over sale prices of recording the state of the entire land market at the same time. They are, of course, far from perfect indices of true—whether market or hypothetical potential—land values. Those in Worcester at this time, however, can be considered more than ordinarily reliable indicators, at least of the former. A loud and lengthy controversy had raged in the mid and late 1880s over inequities in valuation that assigned disproportionately low figures to the holdings of many influential citizens. The result, at least for a few years thereafter, was a new tax roll that the Worcester Telegram, a fierce critic of discrepancies in the old one, acknowledged was much fairer (Worcester Sunday Telegram 1888d).

The lowest land values in the sample were those of the two highest sets of exclusively working-class blocks, those on Millstone Hill and Oak Hill. There were eight such blocks above 183 m (600 ft), with values ranging from 4 to 6 cents per square foot. The two blocks of solidly upper-class residences also above 183 m in elevations—both of them in the Mount Vernon area—displayed much higher values: 18 and 20 cents per square foot. The three predominantly upper-class blocks at lower elevations, however, located in the South Main neighborhood close to Main Street, had still higher values of 33, 37, and 38 cents per square foot. The fifteen homogeneously working-class blocks at lower elevations than those of Millstone and Oak Hills also had distinctly higher values. They amounted to 7, 10, and 17 cents per square foot in the West Side flats near Park Avenue and Beaver Brook, a poorly drained area sprinkled with refuse dumps and other nuisances; to 26 cents in one block on the North Side flats south of Fairmount, and from 10 to 22 cents on the city's southern and southeastern lowlands and the East Side off Shrewsbury Street. Several blocks that included both upper- and lower-class settlement, chiefly in the Mount Vernon and Union Hill areas, displayed intermediate values.

Land values were thus strongly influenced by the character of local occupancy. Blocks quite similar in their site and situation—on Millstone Hill and Mount Vernon, for example—differed drastically in value. Evidently, and not surprisingly, those in areas where very well-to-do residents had chosen to settle commanded a higher price in the market as a result. Other factors also played their part. Closeness to a principal avenue such as Main Street notably enhanced the price of land. But holding these variables constant, the values of lots at an equal distance from the city center were also strongly influenced by elevation. They were lowest of all in working-class sections on the highest ground. They were markedly lower there than in such areas on lower land, and the same relation obtained among well-to-do areas. High land had literally a different value for the rich and the poor. But for both, it was much cheaper than land in comparable neighborhoods elsewhere.

Land values within a homogeneously working-class district of substantial relief displayed the same pattern. The Fairmount neighborhood, a mile and a half from the center, covered an area small enough so that the effects of horizontal situation differences among lots must have
been minor compared to the sharp vertical ones. Land on Hemans Street, the highest in the development, running along the crest of the hill, was only half as valuable as land on North Street, running parallel to it at the base (1.8 cents per square foot against 3.7 cents). Lots on the two parallel streets in between and on the cross streets connecting them up the slope were assessed at intermediate values ranging from 2.5 to 3.1 cents. Here too, high land was devalued by its hard-to-reach situation more than it benefited from its site amenities.

More generally, a professional mover of the era singled out accessibility—in both vertical and horizontal space—as the key to housing cost in Worcester. "If a man works in the neighborhood of the City Hall, and he wants to live near by, he must pay a stiff price for a tenement; but if he wants to walk up to the top of Dunbarven hill, he can get a tenement for a song" (Worcester Sunday Telegram 1889b). Difficulty of access could be accepted in return for cheapness of land. The characteristic occupants of the vertical fringe, as of the horizontal, were those prone for one reason or another to make the trade. The wealthy, who did not have to climb the hills themselves, found an opportunity to assemble large estates at small cost; the poor, who did, could, in compensation, obtain dwelling lots more cheaply than on the lowlands. The city could make the same funds for public park acreage go farther on the hills, while obtaining lands that were scenic as well as cheap. Charitable institutions that needed space found it in the uplands; nuisance and illicit activities that needed privacy found it too. Unlike business, transportation, and most residents, they did not depend on the ease of access that held most urban land uses to the lower ground.\(^5\)

The Emergence of the Modern Pattern

Such were the considerations that held sway just before the appearance of a new factor that was to begin to transform the relations of elevation and settlement. High land became much more accessible than before, and a new phase of occupancy began, with the appearance of the electric trolley and then of the automobile. Both could readily climb slopes too steep for the horse-drawn streetcars that had preceded them. Worcester's first trolley made its inaugural trip in the late summer of 1891 on a line from downtown along Main Street west through Valley Falls and Cherry Valley to the village of Leicester Center. The construction of many more such lines running throughout the area followed in short order.

Among their immediate effects was a phenomenon altogether new in the local real estate market. Large residential subdivisions with evocative and alluring names first began to appear in Worcester in 1892 and 1893. More of them than not advertised their elevation in their very names—"Fairview," "Worcester Highlands," "Elm Hill," "Pleasant View," "Richmond Heights." Advertisements for others—"Groveland," "Columbus Park," "Lakeside"—also emphasized both their elevation and the ease with which they could nonetheless be reached by new or projected trolley lines. There began what had not before occurred, a large movement of the upper and middle classes onto the highest ground of the built-up area, unaccompanied by any significant amount of lower-class settlement. By the time of the 1900 federal census, the East Side hills possessed what they had lacked before the coming of the trolley, a substantial population of middle-class, white-collar residents (Meagher 2001, 126–27). The street network on high ground likewise grew much denser than it had been before. With its handicaps of situation greatly lessened, high land's attractions of site were exploited for development as they had not been in the past.

Developments more elegant and exclusive still appeared with the rise of automobile ownership. One result was that the highest residential areas of the city ceased to be lower-class ones. Other sources of distortion of Burgess's ideal pattern have emerged in the twentieth century. When Worcester adopted zoning in the 1920s, an unusually small area was zoned exclusively for first-class residences; though high in elevation among neighborhoods of the time, it is not as high as many that have been developed since, yet its protected character keeps it a district of especially desirable residence (Natoli 1971). Several relatively high-income areas have appeared on low land near Lake Quinsigamond, with the amenities of a water view, as the contiguous built-up area has reached its shores. The anomalies in the new pattern also include survivals from the late-nineteenth century pattern of occupation. By the mid-twentieth century, an overall tendency was clear for high-income residents to choose the amenity-rich settings of elevated ground (Luna 1957, 98–101). The highest settled areas of the past, however, did not change their character even as higher new ones were settled by the well-to-do. Such areas as Fairmount, Millstone Hill, Bell Hill, Oak Hill, and Union Hill have continued to display lower income levels than their elevation would lead one to expect. In a citywide correlation between altitude and median household income at the block-group level from the 1990 Census \((R = +0.51)\), these areas all lie below the best-fit line. In today's pattern, they represent inheritances from an earlier period of occupation.
Conclusion

A recent article maintains that during the latter part of the nineteenth century, “[i]n New England mill towns, typically, the higher one’s home was above the mill, the higher was one’s social rank” (Mullin 2003, 142). It is a pattern so marked today in American cities generally that one tends to project it backwards into the past. Yet it may not hold true for the past without substantial qualification. Burgess’s altitudinal-zone model for urban residential areas generally fits the present day in the United States better than it does the nineteenth century. If the Worcester case is representative, the earlier relations between terrain and occupation followed a different pattern. It was not a simple inversion of Burgess’s model, from which it differed chiefly in the presence and numerical predominance of the poor in the highest residential areas. It displayed what can best be described as a vertical urban fringe, akin to the familiar phenomenon of the premodern urban fringe in horizontal space. They seem to have arisen for the same reason: the particular difficulty of access to elevated and peripheral locations in an era when transportation was difficult and costly.

Only further work can show whether this was indeed a widespread phenomenon in urban space of the nineteenth century and earlier and whether, if so, the legacies of this pattern have persisted into the present. It is one plausible corollary of the findings reported that Burgess’s model may fit American “hills cities” that were settled well before the end of the nineteenth century less well than it does ones of gentler terrain. Anomalous areas whose character derives from their nineteenth-century use may have to be excluded for that reason from tests of the relationship between elevation and affluence today. If so, our understanding of urban form will be improved, and the plausibility of Burgess’s altitudinal-zone model strengthened.

The contrast between nineteenth-century and present-day patterns in the United States offers an interesting parallel with the contrast currently observable between cities in the United States and in many Third World countries. “Today, hillside residential patterns are dominated by the wealthier members of many North American cities, while flat lowlands are left over for the poor. But this situation is reversed in Latin American cities like Rio de Janeiro and Caracas, Bogota and Lima, where it is predominantly the poor who reside on the hillsides” (Main and Williams 1994, 155–56). In each case, it is in rapidly growing cities that lag in transportation and infrastructural development that high land represents a liability for settlement, and it is under conditions of greater affluence and mass automobile ownership that it becomes an asset instead. The results bear out the claims made by Ullman and Webber about the increasing importance of site amenities as opposed to situation in land use as transportation improves, an idea whose importance for future patterns of land development in an increasingly mobile world it would be difficult to overstate.

Finally, the results offer further evidence of the need to consider the environmental dimensions of cities in order to understand their human geography. They make it clear that research on urban patterns that confines itself to the two dimensions of horizontal space risks missing important determinants of land use. The patterns of land use in late-nineteenth-century Worcester cannot be understood if the vertical dimension is ignored. Environmental features in the form of inequalities in terrain played a major role in shaping the city’s residents into distinct areas. At the same time, they caution against treating terrain as something that always matters in the same way. In the contrast between the occupation of high ground in the late nineteenth century and the late twentieth, they illustrate the changing significance of site features as urban society changes.

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Notes

1. James (1967, 6) deplored the “common misuse” of the word “topography”—which denotes place or areal description of all sorts—to mean merely patterns of elevation. Such available terms as “relief, landforms, terrain,” he pointed out, amply capture the narrower meaning, if it is intended. The point is still worth insisting upon.

2. The term “preindustrial city” was given wide circulation by Sjöberg (1960), but his focus was on cities where an elite exercising an authority at once cultural, religious, and political resided in the center and those of lower status on the margins. Abbott (1974, 37–38) suggested that such cities are better termed “premodern” than “preindustrial.” Commercial but preindustrial cities not dominated by such an elite, he observed, tended to display the same overall residential pattern. The shift in residential patterns that occurred in many European and American cities during the early and mid-nineteenth century will be termed here a change from a premodern pattern in Abbott’s sense to a modern one.

3. City directories have been criticized as sources of data on residential patterns for their presumed incomplete coverage and bias in favor of the well-to-do and the long-settled. Researchers have found them useful nonetheless, and on
detailed comparison they have not always turned out to be inferior even to the chief alternative, the manuscript schedules of the decennial federal census (Thernstrom and Knobbs 1970; 13; Kellogg 1982, 26). In any case, the destruction by fire of the 1890 census schedules leaves only the directories as records for Worcester population patterns at the end of the pre-trolley era, ca. 1891. Moreover, as in a similar study (Kellogg 1982), if poor residents of the neighborhoods in question (here, the Worcester uplands) were indeed undercounted in the directories, the conclusions reached as to their substantial presence there would only be strengthened.

4. Jordan and Rowntree (1990, 392) offer a different explanation, based solely on construction costs (higher on hilly than on level land) rather than transportation costs and/or environmental amenities, for the tendency of hills to house wealthy or poor city dwellers more commonly than middle-income ones. Either, they write, “the increased cost of building may be passed on to the consumer—meaning that those who buy the houses pay more, and the area will be occupied by higher-income groups,” or cheap houses of poor quality on small lots may be built to cut the excessive costs of construction, which “means that lower-income groups will probably occupy the area.” Yet in each case, the houses built would be competing in the market with similar ones of equal quality built at lower cost on level land. The higher cost of building could not be passed on to the buyer, and the only result is that the owners of building lots on easier terrain would reap an economic rent. Increasing or cutting costs for houses built on hills would simply raise or lower the class of houses with which they would compete. As exactly the same would happen with houses suitable for middle-income (or any other) groups, it does not follow that upper- and lower-income groups would be more than ordinarily likely to live on hills.

5. In many other nineteenth-century American cities, inadequate pressure in the city water system added to the difficulties of living on high ground (or even on the upper floors of buildings) (Blake 1956, 269, 277), but not in Worcester in 1891. The city had years before established a “high-service” component to its water system, using the uppermost of its two supply reservoirs, fully capable of meeting the needs of the most elevated neighborhoods (Sanborn-Perris Map Company 1892, 1–2).

References


PhD dissertation, Graduate School of Geography, Clark University.


———. 1892. Green Hill. 8 October: 9.


_Worcester Sunday Telegram_. 1885. The city: Worthy, suffering poor. 8 February: 3.


———. 1888b. The Police Court session. 21 April: 4.


———. 1889c. Won't go home till morning. 27 October: 7.


———. 1889a. Terror of Messenger Hill. 5 August: 4.

———. 1889b. To improve Oak Hill. 28 January: 2.


———. 1890b. A Murder scare. 11 August: 1.

———. 1891a. A brutal dog fight. 4 May: 4.


———. 1891c. Preacher was not there. 26 May: 4.


———. 1894. Where orphans find a home. 15 October: 3.

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