RESIDENTIAL PATTERNS IN THE PRE-AUTOMOTIVE AMERICAN CITY*

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ABSTRACT. The classic geographic distinction between situation and site factors suggests that the former will have declined and the latter increased since the late 19th century in their importance as determinants of American urban residential patterns. We test the prediction by examining the relation of socioeconomic status to horizontal and vertical distance from the city center in the largest American cities in 1880. A comparison of the results with the patterns prevalent in the twentieth century largely, though not entirely, supports the prediction, as do changes in the status of main streets and harbor islands. *Keywords: 1880 census, residential patterns, site, situation, urban geography.*

Geographers have long found a distinction between two sets of factors in location a useful one to draw (Hanson 1999). The labels used for them have varied—they include situation and site, horizontal and vertical factors, location and locale, and space and place—and have not always exactly coincided in meaning. All the same, they correspond sufficiently for the two kinds of variables to be distinguished, labeled, and contrasted. The former term in each pair denotes the elements of an area's location vis-a-vis the world beyond it; the latter, the characteristics that occur in the area itself.

One thesis that has often been drawn from the distinction is that when travel and transportation become easier, faster, and cheaper, the relative importance of horizontal or situation factors in location should decline and that of vertical or site factors, at least of more or less immobile ones, should increase. "With the diminution in transport costs and the consequent reduction in spatial barriers to movement of goods, people, money, and information, the significance of the qualities of place has been enhanced" (Harvey 1989, 10). Edward Ullman applied the thesis to patterns of intraurban land use, proposing that increased mobility, particularly through the rise of mass automobile ownership, had transformed the relative advantages for residence of different districts within cities ([1962] 1980, 192–94). It favored the development of attractive but once difficult-to-reach sites "on the basis of their intrinsic natural and cultural characteristics," and it reduced the importance of "close-in urban locations" whose advantages of what Ullman termed "location or situation" had previously made them the most highly valued ones. To test the assertion, and through it the broader thesis on which it rests, we compare the familiar patterns of the twentieth-century American city with those, to date less systematically documented, that prevailed in what has been called the walking city just

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prior to the transportation revolution brought about by the electric trolley and then the automobile (Warner 1962).

Situation, Site, and American City Form

The categories of situation and site mark out sets of different, and often diametrically opposed, residential advantages and disadvantages for particular locations within an urban area. Proximity to the urban center, as the point of maximum generalized accessibility, is a classic example of a situation advantage. At least in the United States, with its antiurban tradition, however, locations close to the center will also, all else being equal, be unattractive on the score of site, and more remote areas will be regarded as more desirable for residence, with the privacy they offer a particularly valued feature (Johnson 2008). As early as 1815, well-to-do Pittsburghers whose independent means freed them of the need to travel daily to the city center preferred marginal over core locations for residence (Swauger 1978). The same inverse relation between the two qualities appears in respect to vertical as to horizontal distance. Areas high above the city center possess a disadvantageously remote situation, but an advantageous site possessing the amenities of views and breezes (as do upper floors within buildings). Lots located on the main streets enjoy high accessibility and its correlate, greater visibility, but suffer, compared with more-secluded sites, from the disamenities of heavy traffic.[1] If the association of wealth with each of these variables changed in sign between the walking and the automobile-age city, it would bear out Ullman's conjecture.

A wealth of studies in the postwar decades based on block-group or census-tract-level census data supports the hypothesized present-day preeminence of site qualities in American cities. Drawing on the data of the 1980 census, Michael White documented "a steady increase in average income with distance from the center of the city . . . it is the higher-income and higher status groups that live further from the center of town": essentially the pattern predicted in the Burgess model of city form, albeit one modified by many other factors[2] (1987, 141, 179). Research has also confirmed the importance of one of the key factors that Homer Hoyt had cited as tending to produce a sectoral distribution of socioeconomic classes (1939). High ground is consistently associated with high status and lowlands with the opposite (see Meyer 1994 and the studies cited therein; Meyer 2000; Ueland and Warf 2006). In the cities he examined, using housing data from the 1930 census, Hoyt also observed a tendency for the rich to desert the main streets they had once favored, as heavy automotive traffic made them less and less agreeable to live near, and certainly today one rarely finds the wealthy, and one often finds the poor, residing along or close to the main arteries of movement (1939).

For the earlier period, assorted studies of individual cities suggest a very different urban residential pattern in the nineteenth century (and before), with affluent Americans choosing centrally located residences and socioeconomically marginal ones relegated to the fringe: the opposite of the Burgess-model pattern

(e.g., Conzen 1975; Blumin 1976; Kellogg 1977; Bigelow 1978; Swauger 1978; Radford 1979; Kellogg 1982; Johnston 1993).[3] Such studies have identified several other patterns characteristic of the nineteenth-century American city accompanying, modifying, or masking the core-periphery gradient. The rich, they suggest, avoided low-lying areas in favor of moderately elevated ground; at the same time, they also avoided higher and steeper sites (Hurd 1903; Blumin 1976; Meyer 2005, 2009, 2012). They also sought the main streets or avenues leading outward from the urban core, while side streets and alleyways were occupied mostly by the poor (e.g., Kellogg 1977; Bigelow 1978; Borchert 1980; Kellogg 1982; Johnston 1993). These, like the core-periphery pattern, differ strikingly from the distribution of residences characteristic of twentieth-century American cities, whose well-to-do households sought peripheral locations and high elevations and avoided the main routes of traffic, the central factors in the classic Burgess and Hoyt models of city form. In older cities affected by both processes, transportation changes would have tended to devalue core-city locations for residence and draw wealth and the amenities that would follow it, such as good schools, outward. Yet at the same time, the prestige of valued districts and the existence within them of the attractions of originally favored areas would have tended to slow the reversal. Coupled with recent processes of gentrification, the result might be patterns today that are far from simple or straightforward.

But as matters stand, the evidence for the residential patterns of the pre-twentieth-century American city remains scanty and unsystematic, consisting mostly of scattered examinations, sometimes merely qualitative or based on simple map inspection, of individual cities not selected according to definite criteria. Little firm basis exists for generalizations or for a comparison of the earlier to the later urban pattern as a test of the model of the changing relations of site and situation. Taking the main outlines of twentieth-century American city form as given, we examine quantitatively the spatial patterns of residential status in the largest American cities in 1880, using a recently digitized set of census data from that year, in order to provide a better grounding for such a comparison and such a test.

We first determine whether the most basic of the situation factors—distance from the center—had the expected negative correlation with social status in 1880. We then combine it with two measures of elevation and assess the performance of the integrated model. Finally, we examine more qualitatively the attraction of main roads and look at examples of our patterns in the nation's largest city, New York, including one more test of the situation/site thesis, the residential status of the city's small harbor islands. We conclude by discussing the bearing of our results on Ullman's application of the situation/site distinction.

Data Sources and Methods

We chose twelve cities for study from the list of the largest cities in the United States in 1880, according to the results of the United States Census of that year.

We omitted the fifth-largest city, Boston, because its unusual geography—notably, its multiple subcenters, some of them previously independent cities, that were separated from downtown and from one another by wide barriers of water—would have unduly complicated the application of our measure of horizontal distance from the center.[4] In place of Boston, we added the thirteenth-largest city to our study, Buffalo, New York. Our study set thus consists of the dozen most populous cities in the United States in 1880, excluding Boston: in descending order of size, New York City, Philadelphia, Brooklyn, Chicago, St. Louis, Baltimore, Cincinnati, San Francisco, New Orleans, Cleveland, Pittsburgh, and Buffalo (Table 1).

The year 1880 is an appropriate one for two reasons. First, it saw the last decennial census before the advent of the electric trolley in American cities in the late 1880s began to affect their spatial patterns. Second, enumeration district-level data and district boundaries from the manuscript 1880 census for the largest American cities have been made conveniently available through the website of the Urban Transition Project, based at Brown University. The data originally collected by the census enumerators were stored in the National Archives. The Minnesota Population Center and the Church of Jesus Christ of Latter-Day Saints paired to extract the data from the manuscript census and digitize them; the Urban Transition Project then aggregated the data and reconstructed the original enumeration district boundaries, making the results available on its website for public use (Logan and others 2011).

We sought to assess the relationships within each of our twelve cities between enumeration district level values for the Duncan Socioeconomic Index (SEI), calculated from 1880 census data and available at the Urban Transition Project site, and the two most readily quantified of our explanatory variables: distance from the city center and elevation. We included in our calculations all of the enumeration districts that fell within each city's borders at the time of

TABLE I—CORRELATION COEFFICIENTS BETWEEN DISTANCE FROM CITY CENTER AND MEAN SEI

CITY	CORRELATION COEFFICIENT
Baltimore	-0.3107
Brooklyn	-0.2552
Buffalo	-0.5671
Chicago	-0.2849
Cincinnati	-0.2538
Cleveland	-0.5847
New Orleans	-0.4707
New York	-0.0802
Philadelphia	-0.4998
Pittsburgh	-0.1793
St. Louis	-0.3640
San Francisco	-0.4547

the 1880 census (there were as few as 54 enumeration districts in Cleveland and as many as 688 in Philadelphia) except for the few enumeration districts for which the Urban Transition Project provided no SEI and population data. They were mostly parklands and other unpopulated areas. The Duncan Socioeconomic Index, or SEI, was formulated by Otis Dudley Duncan (1961). It serves us as a proxy measure for wealth. The Duncan SEI assessed the socioeconomic status of those holding a number of occupations on the basis of the relative level of prestige or social standing accorded to those occupations in public opinion surveys. It then used the correlations between those prestige rankings and measures of income and schooling to create rankings for additional occupations types from the levels of income and schooling associated with them. The SEI figures for the working population of an enumeration district from the 1880 census records were averaged by the Urban Transition Project to produce the mean SEI value for the district, our dependent variable. Higher SEI values indicate higher status.

In a market economy, such as the United States in 1880, it can be safely presumed that, with minor exceptions, the residents with higher than average levels of occupational prestige (such as lawyers and other professionals, or bankers and other business figures) also had higher than average levels of disposable income, and that those in lower-prestige occupations had, on the whole, lower incomes. If, then, residents with high occupational prestige were also able to outbid other residents for the most-desirable housing locations, leaving the poor to live in undesirable areas, the spatial distribution of SEI values can allow us to assess the relative residential desirability of different areas within the city and the relative importance of situation and site in preferences.

The Duncan SEI is by no means a perfect measure for our purposes. Occupational prestige is not identical to income or other measures of social status or of power in the housing market, which are multidimensional phenomena. Furthermore, there may be a degree of anachronism in applying the SEI, which dates back only to the early 1960s, to the job categories used by the census enumerators in 1880. Nonetheless, SEI should be a strong though imperfect dependent variable for our present purposes. While the prestige of some occupations may change over time, the general patterns tend to be stable. No other variables for socioeconomic status that can be derived from pre-twentieth-century census data are nearly so appropriate.

We used the Urban Transition Project enumeration district boundaries to generate values for the first of our explanatory variables: distance to the city center. We computed the distance of each enumeration district centroid (geographic center) from the location of the active city hall in 1880 and used the natural log of this distance in our complete model. In all instances, the city hall was located on low ground within the central business district and in the heart of the city. We used two sources of data to record the altitude of the centroid

of each enumeration district in our cities. For all but one of our cities, we used the modern digital elevation models from the National Elevation Dataset at one-arc second accuracy published by the United States Geological Survey. San Francisco has undergone locally drastic changes in elevations in the period since 1880 (notably the removal of most of Rincon Hill). To gather reliable 1880 elevation data for San Francisco, we turned to an 1895 USGS topographic map, surveyed prior to the lowering of the hill. We overlaid our enumeration districts and their respective centroids on the topographic map to hand-collect the elevations.

We then created a second elevation variable—elevation squared—by squaring our elevation figures. By including elevation in our model as both a linear and a squared term, we are able to test the possibility of a two-directional effect of elevation on SEI. Higher elevations, we hypothesized, might increase SEI from very low values up to moderate ones (because of such site factors as flood risk, poor drainage, and the disamenities of low-elevation commerce and industry, all site factors), but beyond a certain point might begin to decrease SEI—because of difficulty of access, a situation factor. With both a linear and a squared variable for elevation, we are able to test for both possibilities. A very moderate degree of elevation would be unlikely to pose problems, however, and so we omitted the second elevation variable from our analysis in the two cities—New Orleans and Chicago—with a range of less than thirty meters (about a hundred feet) of elevation within the city boundaries.

The Model

We tested the relationship between SEI and our independent variables by using statistical regression. Statistical regression allows for the computation of *ceteris paribus* correlation coefficients between variables. The standard statistical regression method, Ordinary Least Squares (OLS), is inappropriate for analyzing spatial data when the observation points (in our case, census enumeration district values for our variables) are not independent but rather are spatially autocorrelated (Kelejian and Prucha 1998). Geographically Weighted Regression (GWR) is likewise inappropriate for our study because it is designed to show the effect of space on the slope of the coefficients, which is not our intention (Brunsdon and others 1998). Because our goal is to generate spatially sensitive results, rather than to show the effect of space on our results, we utilize the Cliff-Ord regression model (Equation 1), which is given in general form by:

$$\begin{aligned} y &= \lambda W y + \beta X + u \\ u &= \rho M u + \varepsilon \end{aligned} \tag{1}$$

In this model, y is a vector of observations on the dependent variable, X is the n × k matrix of observations on the independent variables, W and M are n × n spatial-weighting matrices that establish the distance between enumeration

districts, u are spatially correlated residuals, and ε are independent and identically distributed disturbances. λ represents the dependence of y on nearby y values, and ρ is a measure of the dependence of u on the neighboring values of u.

Of the two available forms of the Cliff-Ord model, the spatial lag model and the spatial error model, the latter is preferable when the objective of a study is to control for spatial autocorrelation, rather than to study the strength of the autocorrelation (Anselin 2001). In the present case, we seek to control for spatial autocorrelation, and hence we utilized the spatial error model, which is given by (Equation 2)

$$\begin{aligned} y &= \beta X + u \\ u &= \rho M u + \varepsilon \end{aligned} \tag{2}$$

For our purposes, y stands for mean SEI, β is a vector of length three that represents the effect of our series of explanatory geographical variables on y, X holds our explanatory variables (distance from the city center, elevation, and elevation squared), and u is the model's error term. This error term, u, varies spatially according to the inverse-distance weighted spatial matrix, M, and ε is the residuals of the error term, u. The spatial error coefficient, ρ, absorbs the explanatory power of the spatial autocorrelation, providing unbiased estimators. We ran this model (Equation 2) on 12 selected cities to generate our regression results.

Results and Interpretation

The first of our findings is that the simple correlation coefficients between mean SEI and distance from the city center were negative within each of our twelve cities (Table 1). Without exception, occupational prestige in 1880 decreased as one moved outward from the city hall. This relationship between occupational prestige and proximity to the urban center remained when we applied our complete statistical regression to our cities (Table 11). Mean SEI decreased as the natural log of distance from the city center increased in each of our cities. This relationship was statistically significant at the 1 percent or 5 percent confidence interval in all of our cities. This finding is of interest because a substantial degree of decentralization of the well-to-do as early as 1860 has been asserted both for New York (Blackmar 1989) and for a number of our other cities as well (Jackson 1975; Blumin 1989). But our results suggest that even by 1880, such outward movement as had occurred had not been sufficient to obliterate or even to seriously weaken the dominant reverse-Burgess pattern of social status, which remained prevalent in the largest American cities, except in New York, which showed much the weakest correlation between proximity to the center and SEI. The largest cities were the very ones in which suburbanization on a substantial scale is likely to have occurred the earliest, for reasons of both supply (a critical mass of commuters to support

Table II—Regression Model Results

CITY	LN DISTANCE	ELEVATION	ELEVATION SQUARED	SPATIAL AUTOCORRELATION (RHO)	NUMBER OF OBSERVATIONS
Baltimore	-3.88** (1.62)	0.148** (0.0610)	-0.00102 (0.00151)	44.7** (21.3)	224
Brooklyn	-1.31*** (0.358)	0.307*** (0.0739)	-0.00587*** (0.00142)	29.2** (12.0)	250
Buffalo	-2.63*** (0.583)	5.94** (2.29)	-0.0155** (0.00612)	76.2*** (16.7)	67
Chicago	-2.34** (1.07)	0.606*** (0.220)	xx	56.8*** (14.0)	189
Cincinnati	-1.72*** (0.401)	0.142 (0.165)	-0.000293 (0.000425)	37.6*** (12.3)	86
Cleveland	-3.62*** (0.659)	0.130 (0.440)	-0.000194 (0.00103)	64.8 (67.7)	54
New Orleans	-3.53*** (0.487)	-0.0579 (0.312)	xx	62.9*** (19.1)	92
New York	-1.04*** (0.274)	0.301*** (0.0531)	-0.00479*** (0.00106)	9.33*** (1.72)	671
Philadelphia	-3.23*** (0.343)	0.103*** (0.0204)	-0.000787*** (0.000181)	13.2*** (3.79)	688
Pittsburgh	-1.53*** (0.550)	0.263* (0.155)	-0.000475* (0.000274)	48.1** (20.2)	78
San Francisco	-2.64*** (0.391)	0.00641 (0.0177)	-0.0000902 (0.0000876)	17.9 (4.56)	229
St. Louis	-1.43*** (0.571)	0.0165 (0.465)	0.000238 (0.00160)	34.4*** (9.67)	169

*,**, ***signify statistical significance at the 10%, 5%, and 1% confidence intervals, respectively. Heteroskedastic-robust standard errors are included within parentheses.

mass transit and suburban public services) and demand (the disamenities of high congestion in the center). It may reasonably be supposed that the same reverse-Burgess pattern still prevailed in smaller cities in 1880 to at least as strong a degree.

The parameter estimates for our other explanatory geographic variable, elevation, suggest that wealthy people tended to favor regions at middle elevations. The variable displayed a two-way effect (with both the lowest and highest elevations disfavored). In addition to our statistically significant findings, we also note that the lack of statistical significance for many of our parameter estimates for the two forms of elevation is revealing in itself. The present-day association of wealth with high elevation is well recognized and documented; the contrast with its statistical insignificance in many pre-automotive cities indicates an alteration of settlement patterns in the same way that a reversal of sign in the others does and presents a striking contrast to the allure of high ground consistently evident in the modern city.

Many of our cities in or around 1880 were well known to have a concentration of wealthy residents along one or more wide, well-traveled avenues leading from the center outwards. Such a concentration was one of the principal forms originally proposed for well-to-do sectors in the Hoyt model and widely characteristic of urban America in this period (Cigliano 1994). Among our cities, New York City had such a thoroughfare in Fifth Avenue (Broderick 1994; Domosh 1996); Philadelphia had Broad Street (Glazier 1884; Skaler 2003); Chicago had Prairie Avenue (Molloy 1994); New Orleans had St. Charles Avenue (Starr 1994); Cleveland had Euclid Avenue (Cigliano 1991; Borchert and Borchert 2002); and Buffalo had Delaware Avenue (Kowsky 1994; Borchert and Borchert 2002). (Commonwealth Avenue played a similar role in postbellum Boston: Domosh 1996). The pattern is strikingly different from the one evident today, and indeed many of these avenues and similar ones in other cities became declassed, as Hoyt (1939) noted, with the advent of mass automobile ownership. Conversely, alleys, classically areas to which low-status groups were relegated in the pre-automotive city (Borchert 1980), appear to be more positively regarded today than the nearby main streets are (Ford 2001). As with the factors of distance from the center and of more than moderate elevations, the change since 1880 testifies to an increase in the role played by site advantages as compared with those of situation.

New York: Walking City Geographies

New York City, in 1880 as today the largest urban center in the United States, vividly illustrates some of the pre-automotive patterns in residential location. The highest land on Manhattan, the Upper West Side in the island's northwest quadrant, had a distinctive set of occupants in the post–Civil War years, the ones equally characteristic of the pre-trolley horizontal urban fringe: public

institutions, nuisances, and a residential mix of working-class dwellings and shantytowns with a scattering of mansions and estates (Boyer 1985; Dolkart 1998; Stern and others 1999). The area was overshadowed by the buildings and grounds of two large institutions, the Bloomingdale insane asylum, which gave its name to the entire district before today's "Morningside Heights" supplanted it, and the Leake and Watts Orphan Asylum; it was also the location of the New York Colored Orphan Asylum, which had been rebuilt there after being burned down in the draft riots of 1863 (Mabee 1974). (The highest-elevation residential cluster in nearby Brooklyn in 1880 likewise consisted of an outcaste institutional population: the inmates of the Kings County Penitentiary atop Crow Hill, at an altitude substantially higher than the well-to-do neighborhood of Brooklyn Heights.)

An 1865 report on the sanitary condition of New York provided a detailed district-by-district account of terrain, land use, housing, and health conditions. Though it blamed much sickness on poor drainage and other concomitants of low land, the picture it drew of the island's highest tracts, on the mid- and Upper West Side, was not much brighter. It traced some of the ill-health chronic on the highlands to the disruption of natural drainage channels by road construction and development, leading to the accumulation of stagnant waters and filthy runoff in pools, puddles, and hollows. But it attributed the poor health of the area, which by nature should seemingly have been much better off than the lower ground on the rest of Manhattan, mainly to the invasion of the poor, who were obliged to settle on such land as no one else wanted. Such land included not only the damp ground and flooded cellars of the Lower East Side but also the high and rocky terrain at the island's opposite corner. The pattern, the report observed, had been obscured by a second one that, though much less significant, was also much more noticeable: the scattering of mansions and country estates in the same district. Because these tended to be built on the main avenues along which passed such traffic as the area saw, they produced an optical illusion, a false impression on outsiders of wealth and ease as the marks of life in the highlands. But behind them, out of sight, the report continued, a substantial majority of the West Side highlands' residents lived in poverty in primitive shacks and shanties (Citizens' Association of New York 1865). Intensive urban development and middle-class settlement north of Central Park occurred mostly on the lower and flatter lands on the island's east side (Osofsky 1966). The contrast in occupance within the West Side also illustrates the favored position in the pre-automotive of locations along main streets, one especially underlined in 1880 New York City by the residential preeminence of Fifth Avenue (Boyer 1985; Domosh 1998; Stern and others 1999).

More localized patches of high ground represented a commonly noted disadvantage for residence in late-nineteenth-century Manhattan. In New York City, *circa* 1880, the summits of rocky ridges were, along with the waterfront, the typical sites for the most marginal form of housing, low-income shanties

and squatter settlements (Neuwirth 2005; Jindrich 2010). A 1883 short story by the writer-reformer Lillie Devereux Blake takes place in an unnamed city that is plainly the New York of that era. It begins on a cold and dreary December day by contrasting "the wide, handsome city streets" whose "neat sidewalks and fine houses had a look at least of wealth and comfort," with a scene nearby, "on the top of a high hill, where were crowded a cluster of wretched hovels." The hilltop colony as Blake described it was a "refuge for poverty" because, and not in spite of, its elevation. The rocky outcrops that formed the hill "rose in a jagged pile thirty feet above the regular grade of the city," making construction costly and discouraging all but the poorest residences, as did the challenge of climbing the hill, by paths that were steep, winding, and "rough and difficult" (Blake 1883, 497–98). Such extensive land uses as large city parks were concentrated on lands devalued by their elevation and rough terrain (Rozenzweig and Blackmar 1992; Stern and others 1999). The construction of tall buildings for residence was only beginning to create amenities of elevation in the built environment, made accessible by the elevator, that could rival or surpass those provided by the land surface (Plunz 1990). No part of the city was more spatially marginal, more difficult of regular access, than the harbor and river islands lying off Manhattan's shore, and none was given over more entirely to its lowest classes (Richmond 1872; Seitz and Miller 2001). Blackwell's Island (renamed Welfare Island in the early twentieth century and Roosevelt Island more recently), housed a penitentiary, a poor house, a lunatic asylum, and a number of public hospitals for incurable or contagious diseases and charity cases. Randall's and Ward's islands housed a smaller collection of similar facilities. Boston's harbor islands displayed a similar pattern of occupance (Meyer 2009). These isolated spaces of ground outdid even the horizontal and vertical urban fringes in a social marginality that paralleled their spatial marginality. No parts of the city possessed less of the quality that made land at the core so costly, the situation advantage of easy proximity to other land and other activities.

Once more, the contrast with today is striking. If harbor islands represent an extreme of poor (because remote) situation, they equally represent an extreme of attractive site. The proposed return to New York City in the late-twentieth century of Governors Island, long held for national military purposes, was widely seen as holding the promise to create "one of the city's most affluent and desirable neighborhoods" (Seitz and Miller 2001, 22). In the twentieth century, artificial islands have been created extensively off Miami, Florida, and other cities in largely successful attempts to entice wealthy residents. Fisher's Island in Biscayne Bay was the wealthiest and most-exclusive community in the United States in the early twenty-first century (Lowenthal 2007). In stark contrast, the urban harbor islands of 1880, when occupied, were the homes not merely of the poor but of society's outcastes: the residents of institutions for those classified as delinquent or dependent.

Conclusion

A recent book asserts that American cities of the early twenty-first century have begun a "demographic inversion" whereby the center will trade its twentieth-century status as the home of poverty and deprivation for the affluence and prestige formerly found on the periphery (Ehrenhalt 2012). Only time will tell if the forecast comes true or not. In any case, though the book does not discuss it, such an inversion, if it occurs, would rather, on the evidence presented here, represent a re-inversion, one where distance from the center reasserts a role that it held through the late-nineteenth century.

Site factors were certainly not irrelevant to residential choice in the American walking city of 1880, as witness the preference of high-status residents for moderate elevations above the city center rather than lower ones whose disadvantages were at least in part ones of site. Neither has situation lost all of its importance today, as the continued existence of clustered urban settlements themselves testifies. All the same, our results support the thesis of a shift in the relative weights of the two sets of factors, with situation receding in significance and site gaining between 1880 and the present. As late as 1880, before the arrival of efficient mass transit, distance from the center, substantial elevation, and the marginality of a side street or of an insular location were principally disadvantages for residence in America's major cities. Thereafter, the advent and mass diffusion of the automobile made movement in both horizontal and vertical space much easier than it had previously been. Centrality and location on main arteries of movement went from being an asset to a liability for residence; the well-to-do no longer avoid high elevations; and small urban islands, once dumping grounds for outcaste populations, have become magnets for wealth. Locations favorably situated have proven for the most part unfavorably sited, and the changing importance of the two factors has led to a reversal of important urban spatial patterns.

These cities, the nation's largest in 1880, would not be the best places to look for a clear exemplification of the modern automobile-city pattern, having inherited many patterns in street layout, land division, and built environment from the walking city. These fossil legacies would tend to obstruct a smooth transition to a new layout, one based more on site than on situation qualities. A clear dominance of site over situation is more to be expected in cities that developed largely during the trolley and automobile age, which lie principally in the West and South.

Notes

[1] Waterfront locations are another possibly relevant dimension of urban form, but are omitted from discussion here as being difficult to interpret in situation/site terms because of some ambiguities. They had and still have both advantages and disadvantages in site terms (views and seclusion versus flood risk, poor drainage, and commercial and industrial disamenities) and in situation terms as well (economic centrality in port cities but marginality to the bulk of the urban land area).

[2] White (1987) based this conclusion on an analysis of spatial patterns in data from the 1980 Census in a sample of twenty-one carefully chosen SMSAs. His conclusion (pp. 178–79) that patterns in socioeconomic status followed a zonal (concentric-ring) pattern much more than they did a sectoral one calls into question the orthodox view, based on the factorial ecology literature of the 1960s and still presented in many textbooks of urban geography, that a sectoral pattern in status tends to prevail. In any case, both are evident even on simple map inspection in most American urban areas. Hackworth (2005) also documents consistently positive correlations in modern American cities between distance from the center and such measures of affluence as income, rent, and house value. His work also suggests that the statistical weakness that many of the correlations display, and their downward tendency in recent decades, may be the result of an increasing polycentricity of metropolitan areas as they expand and absorb smaller preexisting urban centers.

[3] As Radford (1981) observes, it would be an error to equate this pattern with Sjoberg's (1960) model of the preindustrial city, which it superficially resembles, for the two have entirely different rationales. Sjoberg's assumes a traditionalistic and preindustrial caste society unlike that of the eighteenth- and nineteenth-century United States. We prefer to call the pattern we describe here simply a reverse-Burgess pattern.

[4] Even determining distances via the closest bridge would not be satisfactory, for one substantial neighborhood of the city, East Boston, had only ferry connections to the center in 1880, and distances would need to be further weighted by some index of the difference between bridge and ferry access. A study of late nineteenth-century Boston has, in any case, identified several of the patterns we investigate in the other cities, notably the preference of high-status residents for moderate but not high elevations (Meyer 2009), and the application of our model to Boston (using straight-line distances from City Hall) produces results similar to those found in our other cities.

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