URBAN VERTIGO

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ABSTRACT

Since its inception in the late nineteenth century, and with its
evolution since then, the skyscraper has presented well-documented chal-
lenges to developers, architects, and policy makers. This study rein-
vestigates these challenges by taking a hard look at the controversies
skyscrapers have occasioned. The reasoning behind this methodology is
that conflicts like these can tell as much about broader issues as they
can about the subject at hand. Accordingly, skyscraper debates in four
American cities are probed: Boston, Chicago, Washington, D.C., and San
Francisco.

Among the findings are these: First, the skyscraper, by virtue of
new problems it presented, effected changes in the legal constructs of
American planning law. Second, the conflicts that emerged revolved
around deeply felt values concerning economics, health, safety, aesthetics,
and the quality of life. Third, that the challenges skyscrapers present-
ed necessitated a clearer understanding of how cities function and grow.
And, fourth, the skyscraper magnified the differences between various
people's goals, and so became an impetus for early development
restrictions.

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Several people deserve thanks for their aid in seeing me through this study. Professor Gary Hack, my advisor, comes first to mind. His keen sense of what was and was not meaningful directed me towards that which was, induced me to eliminate that which was not, and, all told, has helped me write something less banal that it might otherwise have been.

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The skyscraper is America's most recognizable architectural achievement, and though its silhouette can be seen worldwide, its strongest associations are still with this country. It has also been the focus of ongoing conflict since its inception in the late nineteenth century. As with much in history, to understand such conflicts is to understand the milieu within which they occurred. It is with this in mind that this study explores the conflicts the skyscraper has provoked. In the end, this should reveal, first, much about the skyscraper and, second, much about city building.

Briefly, why was the skyscraper developed? The most widely recognized reason is that it satisfied the needs of business, and indeed this is a recurring theme throughout skyscraper debates. Its development coincided with and acted as a catalyst for corporate expansion.
during the late nineteenth century. Though it was unique, its role was not. As Lewis Mumford has noted, its development and that of other machines—e.g., the typewriter and the telephone—moved forward rapidly because they could bolster corporate profit making. In short, the skyscraper satisfied the headquartering needs of growing corporations, especially in terms of coordinating the functions of production, distribution, and financing. Towards this end, it also became a symbol of corporate power: its form and location (in urban centers) helped instill confidence in corporations. This was crucial if those corporations were to continue to grow.

Still, these purposes do not suggest why skyscrapers should be so controversial. The reasons have to do with divergent goals within society, particularly with regard to problems of economics, aesthetics, health and safety, and quality of life. This study looks at these concerns and provides insights into the following questions:

Skyscraper debates forced people to be explicit about those things they value about cities. Simply, what are they and why are they valued?

Skyscrapers were the subject of early controls on development. What issues of balancing public and private needs through standard setting did they raise?

The skyscraper and the debates it spawned were a barometer
of people's understanding of city form. How has that understanding developed and matured?

Given the problems associated with skyscrapers, why do they continue to be built and why have controversies persisted?

These issues are explored by looking at debates that have transpired in Boston, Chicago, Washington, D.C., and San Francisco. Each city is important for its own reasons. Boston, which is looked at near the turn of this century, was one of the first U.S. cities to promulgate height restrictions. Court cases challenging these influenced legal constructs of property rights and so set the stage for future property controls. Chicago, the birthplace of the skyscraper, epitomized the conditions for capitalist expansion mentioned previously. The Chicago debate shortly followed that in Boston and was, significantly, the most comprehensive of that era. As for Washington, its symbolic importance as the Capital places unique demands on its architecture: federal buildings and monuments are to dominate all others. Its debates are enlightening because they pit local and national needs against each other. Both early and recent debates are considered in this case. Finally, San Francisco has experienced an intense, ongoing debate for the last fifteen years. It has been the most heated in recent U.S. history and has raised a potpourri of skyscraper issues including many
never raised earlier.

The study also presents aspects of history that help explain the evolution of the skyscraper and help frame the debates. The earlier cases are aided by a chapter on technology and social conditions during the late 1800s. In addition, the early and recent cases are bridged by an overview of those theories of the modern movement which have had especial influence on modern skyscrapers and their uses.

Finally, it must be said that skyscrapers have been discussed and written about countless times. Still, it is my hope that by focusing on skyscraper debates, new insights into their form and that of American cities will emerge.
Nations and civilizations will rise and fall and historians of the distant future may decree that we were not many of the things we now think we are, but certainly they will say of us that we were a nation of builders, the greatest the world had known until then. They will say it if we never build another structure, if we never draw another design. We have created a great new architecture that has taken its place with the classics.

The skyscraper was but one of many technological achievements during what Lewis Mumford has called the "Brown Decades," those years between 1865 and 1895. The telephone, electric light, gas engine, and typewriter are among the others which, if not invented then, at least became fully developed during those years. Their inception, and that of machines in general, moved apace because of demands placed on market economies to increase the production and distribution of goods, two of the driving forces of the industrial revolution.

Certain technological improvements of that era were important in the development of the skyscraper; especially the improved elevator, the Bessemer steel process, and the invention of the structural steel frame. Before elevator mechanics were improved, buildings were built no higher than six or so stories because of the limits of human strength for
climbing stairs. Moreover, the ability to build higher existed, but the incentive did not since rents tended to drop off above the third story. Freight elevators were used in Boston and New York before 1850, but they were very slow. Also slow was the first passenger elevator, installed in a New York store in 1857 by Elisha Otis. In time, however, further improvements—like the suspended elevator and the hydraulic piston elevator—enhanced the elevator's use and made taller buildings increasingly practical.

The Bessemer process, invented in 1856, encouraged the iron industry to move from cast and wrought iron production to increased steel production. The use of cast iron in buildings dates back at least to 1780 when it was used to replace wood posts in English cotton mills. Paxton's Crystal Palace (1851) is probably the best known example of a totally iron-structured building. As for the Bessemer process, it was discovered by accident when Bessemer used an iron with a low phosphorous content in an experiment to decarbonize the iron. The process allowed steel to be produced more cheaply than wrought or cast iron. Steel's major early use was for armaments and the transport of armies.

Mumford claims that when wars ended, like the American Civil War, the armaments industry (i.e., steel industry) needed new markets for its
fig. 1,2: London, Paxton's Crystal Palace
technologies. The building industry, along with the structural steel frame, became one such market. In the 1880s, a Minneapolis architect, Leroy Buffington, claimed authorship for an idea to support masonry building envelopes on steel shelves hung from steel frames. Others, however, claim he pirated the idea from William Le Baron Jenney's Home Insurance Building (Chicago, 1885). Daniel Burnham said that Jenney, a Chicago architect, deserves credit for the system and, hence, the skyscraper. Jenney's Fair Store was the first structure built using the system entirely (Chicago, 1893). Regardless of authorship, the system was important. It freed ground levels from the thick structural supports required of masonry systems, allowed larger windows for views from offices and into store display windows, and shortened construction times.

The skyscraper satisfied the needs of American businesses which, because of improved production and distribution capabilities, were expanding rapidly. Early skyscrapers were usually office buildings with a floor or two of mercantile uses at ground level and layer upon layer of identical office floors above: "a system of cells--hundreds of similar rooms side by side and superimposed, equally desirable (so far as possible), and equally well lighted." One of their most important objectives was to satisfy the home office requirements of national and inter-
fig. 5: Chicago, Home Insurance Building, W.L.B. Jenney

fig. 6: New York, Singer Building, Ernest Flagg

fig. 7 (top), 8 (bot.): New York, Woolworth Building, Cass Gilbert
national corporations. They, along with other technological improvements (especially the telephone), allowed emerging corporations to run dispersed plants from a single location, usually the financial center of a larger city. Densities in these areas increased as more skyscrapers were erected, and together they provided opportunities for the face-to-face meetings necessary for securing new national and international markets. In addition, skyscrapers were a symbol of prestige and power for corporations and provided advertising for them. Cass Gilbert's Woolworth Building (New York, 1913) and Ernest Flagg's Singer Building (New York, 1913) are early examples.

Skyscrapers also raised numerous fears. Some of the earliest ones were about issues of health, a problem brought to the public's attention by conditions in working-class housing districts and by inroads made in the field of health during that time.

The industrial revolution had brought rapid urbanization to nineteenth-century industrial cities. New technologies and machines had created jobs which enticed people to move to New York, Philadelphia, Chicago, and other large cities. A problem that arose was that poorer, working-class citizens were often housed in crowded and unsanitary
conditions. But at the same time, discoveries in the field of health were being made. By the mid-1860s, Louis Pasteur and Joseph Lister were establishing relationships between poor sanitary condition, germs, and communicable diseases. Too, the curative powers of the sun were becoming known. It was found, for example, that sunlight helped prevent rickets and cure tuberculosis, could sanitize water, and could reduce the number of pathogenic bacteria in the environment. Additionally, it was clear that dark, damp places—mines, slum housing, factories—were breeding grounds for bacteria. Accordingly, an early, recurring fear of skyscrapers was that they would change once sunny streets into places like these, and in doing so provide opportunities for the spread of disease.

As for the housing conditions themselves, New York's, by no means unique, offer some insights. By 1865, the city found itself, because of industrialization and immigration, with a working-class population of 500,000. They were packed into tenement housing covering no more than two square miles and usually surrounded by the worst of health conditions. Illnesses were expected and common and often simply labeled "tenant-house rot;" tenements themselves were called "fever nests." Such conditions stirred social reformers in New York into action.
In the early 1860s, one such group embarked on a study of tenement housing sanitation, dividing such areas into twenty-nine districts. Each was assigned an investigator (usually a doctor), responsible for making house-to-house visitations, mapping the occurrence of disease, and describing the district's physical attributes. The study exposed terrible living conditions which were said to affect the physical, mental, and moral well-being of tenement inhabitants.40 One investigator, writing about street filth, said

As a rule, the streets are extremely dirty and offensive, and the gutters obstructed with filth. The filth of the streets is composed of house-slops, refuse vegetables, decayed fruit, store and shop sweepings, ashes, dead animals, and even human excrements. These putrifying organic substances are ground together by the constantly passing vehicles. When dried by the summer's heat, they are driven by the wind in every direction in the form of dust. When remaining moist or liquid in the form of "slush," they emit deleterious and very offensive exhalations.

Compounding the health problem with their stench and wastes were the numerous slaughter houses found within these areas. Christopher Tunnard has said that it was not until the 1890s that cattle, sheep, and pigs were cleared from some city streets.46 Equally problematic were privies and cesspools; overflowing sewage and a shortage of facilities were common. One investigator found a privie with four seats (open to
fig. 9, 10, 11: New York, 1866, tenement housing
each other) for a building with one hundred tenants. Such conditions were not at all rare. 40

Revelations like these led to numerous housing reforms including health laws and development of the dumbbell tenement. However, reform efforts did not immediately eliminate the problems. For instance, in 1892, because conditions were still bad, Congress funded a study to look at tenement-housing in New York, Philadelphia, Chicago, and Baltimore. And in the early 1890s, the New York state legislature authorized appointment of the Tenement House Committee. They produced a 600 page report which in the end blamed congestion (over-crowding) for many of the problems in tenement housing districts. Interestingly, the issue of congestion became an important impetus for the first national conference on city planning. 37 It was also a concern associated with skyscrapers.

In general, reform movements like those mentioned above were led by the well-to-do, supposedly on behalf of those less fortunate. Mel Scott has written that there was nothing novel about such efforts; they were simply an extension of a broad, growing concern for the public welfare that had been in place for thirty or forty years. 37 Others have taken a more critical view. Engels, writing in The Housing Question, said that those who were better off (the bourgeoisie) became philanthropic when
SANITARY AND TOPOGRAPHICAL MAP OF THE TWENTIETH DISTRICT.

REPORT OF THE TWENTY-FIFTH SANITARY DISTRICT.

Prevaling Diseases in one square in 1864, prior to Oct. 1st.

1. Two infants died of diphtheria.
2. An infant died in warm weather.
3. Two infants, spoon-fed, died in warm weather, twelve and fourteen days old.
4. An infant had the bowel complaint during the six weeks preceding Oct. 1st.
5. An infant has had the same complaint during the six weeks preceding Oct. 1st.
6. An infant died of cholera infantum in warm weather.
7. A boy two years old had typhus fever in September. An infant died in the summer.
8. An infant had bowel complaint in hot weather.
9. A spoon-fed infant died of cholera infantum. A girl about eight years of age has typhus fever at present (Oct. 1st).
10. Two children had dysentery.
11. Two children had inflammation of eyes.
12. A child twenty-one months old had diarrhea all summer.
13. Two infants had cholera infantum; one died. One child has inflammation of ears.
14. An infant one year old had cholera infantum.
15. An infant had cholera infantum in summer. A girl had fever (probably typhus).
16. Two cases of dysentery, and three of cholera infantum in hot weather.
17. One case of cholera infantum.
18. An infant in the summer very sick with cholera infantum. A girl eight years old now has fever.
19. An infant had cholera infantum.
20. Severe attack of dysentery in an adult.
21. An infant died in warm weather with the bowel complaint.
22. An infant died of cholera infantum.
23. An infant sick with diarrhea in summer, recovered.

fig. 13, 14, 15: New York, 1866, tenement housing districts
they realized that the epidemics of the poor could be transmitted to
them. Lewis Mumford has said something similar:

> The rich feared the poor and the poor feared the rent collector; the middle classes feared the plagues that came from the vile unsanitary quarters of the industrial city; and the poor feared, with justice, the dirty hospitals to which they were taken.

Whether such fears were so clearly defined is debatable, but presumably there is some truth in them. Moreover, the social pathologies of the poor were apparently instrumental in bounding early skyscraper debates, especially when it came to issues of light and air and congestion. There were, however, other early concerns. That fires—which had had a long history of city destruction—would be especially destructive in skyscrapers was one such recurring fear. Not surprisingly, economics were also important. This is understandable given that skyscrapers satisfied economic needs and that whose who advocated them (and sometimes those who opposed them) had economic motives underlying their positions. Skyscrapers were also criticized for what they symbolized: corporations struggling for power, money, and profits. Criticisms on these grounds also held that tall buildings lacked the permanence and spirit of more important architectural symbols, e.g., the church and structures of government. These issues and others are discussed in
greater detail in the chapters that follow.
In 1891, the Massachusetts state legislature established for Boston a city-wide height limitation of 125 feet. Boston height standards following this initial regulation resulted in a number of court cases whose far-reaching decisions influenced in important ways the course of American land use and planning law. Most notably, they affected the legal construct of the police power. This chapter looks at these cases and regulations and the hearings of the 1916 Commission on Building Heights. Together they show a struggle to understand the proper role of public intervention in private development and the effects such intervention can have on real estate economics.

In 1899, the state legislature passed a 70-foot height restriction on a tract of land downhill from the State House. This was done to protect the capitol's dominance on the skyline, a goal the state claimed was a public benefit. In keeping with then contemporary notions of
fig. 16: Boston, State House
Charles Bulfinch

fig. 17: Boston, 1916,
Commonwealth Avenue
fig. 18: Boston, Trinity Church, H.H. Richardson

fig. 19: Boston, Boston Public Library, McKim, Mead and White
property rights, the law required compensation to landowners if a court found there was a taking of constitutionally guaranteed property rights (see insert on the police power). In 1901, a landowner went to court to challenge the law (Parker v. Commonwealth) and to collect damages. The court found procedural problems with the law but substantiated the state's claim that the public would benefit by maintaining the beauty of the capitol. The court found this goal just as proper as protecting people from loss by fire.

The court said it was legal "to save the dignity and beauty of the city at its culminating point for the pride of every Bostonian and for the pleasure of every member of the State." An important aspect of the court's decision was that compensation was deemed necessary, implying 1) that a taking had occurred and 2) that the law did not fall under the police power. If it had, compensation would not have been required.

The Copley Square restrictions were enacted in 1898 by the state legislature to control traffic and pedestrian congestion and meet aesthetic ends. The square's character was already firmly established by two beautiful and dignified buildings bordering it: on the west side was the Boston Public Library by McKim, Mead, and White (1888-1895) and to the east was Trinity Church by H.H. Richardson (1872-1877). To the
THE EXPANDING POLICE POWER

The Fifth Amendment of the U.S. Constitution states that any taking of property rights by government must be founded on some public use and must include compensation to the property owner from whom the rights are taken. The legal construct embodied in this process is that of eminent domain. It was the guiding philosophy for most matters of public control of property until the late nineteenth century. It gave property owners some assurance in property ownership.

Changes occurred near the turn of the century as land use laws were increasingly based on police power, a power vested with each state through the Fourteenth Amendment. The important distinction to be made between it and eminent domain is that the former does not require compensation as long as the property owner has been treated with "due process." This was an important change that struck at the sanctity of property ownership. It is upon the police power which most American land use and planning law now rests. Briefly, the police power is constitutional as long as property restrictions do not constitute a taking. In general, this means that the law must promote public health, safety, and general welfare, must not be arbitrary or capricious, and must be reasonable. 49
The character of the square was further enhanced when the Copley Plaza Hotel was built on the south side. Designed by Henry J. Hardenberg and Clarence H. Blackall (1912), it fell under the guidelines of the 1898 height restrictions: 100 feet along Boylston Street and 90 feet along the other three sides.

Like the State House restriction, this statute allowed for compensation and was taken to court, this time in the case of Williams v. Parker (1899). The case, said to be the first on modern zoning, was over whether a 10-story, 120-foot tall building could be built on the corner of St. James and Trinity Place, a site falling under the restrictions. The law was upheld in the Massachusetts Supreme Court as a legal use of eminent domain. But the court also said that the law could have been written using only the police power, and that this power could be used to aid the safety, comfort, convenience, and benefit of property owners generally. The court said:

It would be hard to say that this statute might not have been passed in the exercise of the police power, as other such statutes regulating the erection of buildings in cities are commonly passed.

Regardless, since the statute required compensation—that is, since
eminent domain was used--the court had to find that some public use was satisfied by it. They found one: by restricting heights, more light and air would enter the square, and people within it could see over buildings more easily. According to Norman Williams, Jr., most American zoning proceeded directly from this statement. Simply, it implied that public control of private land did not necessarily require compensation. 49

1904 HEIGHT LIMITATIONS...

In 1904, a commission was established to recommend new citywide height restrictions to supersede those in affect since 1891. The outcome was a division of the city into two districts--district A and district B. District A had a limitation of 125 feet, was only downtown, and was commercial in character. District B was residential and had a limitation of eighty feet except on streets more than sixty-four feet wide. In this case the limit was one and one-quarter times the width of the street to a maximum height of one hundred feet. Additionally, the State House and Copley Square limitations were kept. 49

The districting was significant: it was the first time an American city had different regulations for different districts. That is, it was the first time a city had been "zoned." According to Elizabeth Herlihy, this law was the "cornerstone upon which rests the principle of zoning for height throughout the country."
Regardless, the 1904 limitations did not sit well with everyone. The most important instance ended up in court and involved a proposed 125-foot building in a residential district facing the Boston Public Garden. The case, Welch v. Swasey, went to the Massachusetts Supreme Court in 1907 and the U.S. Supreme Court in 1909. Two critical questions were tested. First, can building heights be limited as an exercise of the police power? Second, under the same power, can areas of a city be differentiated by prescribing different height limitations for each area?

The courts apparently thought so and upheld the law as constitutional on both counts. The Massachusetts court's opinion noted that tall buildings on narrow streets can affect public health. The court's opinion states:

The erection of very high buildings in cities, especially upon narrow streets, may be carried so far as materially to exclude sunshine, light and air, and thus to affect the public health. It may also increase the danger to persons and property from fire, and be a subject for legislation on that ground. These are proper subjects for consideration in determining whether, in a given case, rights of property in the use of land should be interfered with for the public good.

The court also said that higher land values and greater demand for space downtown were sound rationale for allowing taller buildings. The U.S.
Supreme Court agreed with these points, adding that delimiting areas of the city was a proper use of the police power.49

Still, the courts' approval did little to quash opposition to the law. Following are reactions to the 1904 law as revealed in 1916 at hearings held by the Commission on Height of Buildings. The hearings were a litmus of then contemporary attitudes about city building and the role of the government in intervening in private property. They reveal a struggle to understand the workings of real estate markets, strategies to maximize investment returns on property, and the effects city policy can have on each of these. Thus, under a seemingly simple matter--building height regulations--lay a rich sampling of important issues.

THE 1916 HEARINGS

The purpose of the 1916 hearings was to determine if district A's boundaries should be extended. Participants came with pro and con views about equally represented, though some participants represented very powerful interest groups, most notably the Massachusetts Real Estate Exchange (MREE) and the Boston Real Estate Exchange (BREE). Members of these groups generally wanted to see the boundaries relaxed or removed entirely. The strongest advocate for maintaining the boundaries was Nathan Matthews, an attorney who had chaired the commission that
established the 1904 regulation.

The arguments embedded within the minutes of the 1916 hearings were about health and safety, economics, and aesthetics.

Debates about public health and safety were similar to those in other cities at the time, though less emphasis was placed on them here. The reason is that the Boston hearings were dominated by real estate and business interests. If more people with public health backgrounds had participated, health and safety concerns would have been represented more strongly.

For one, it was clear that light and air were considered important to people's well-being. A trustee of the Boston Public Library, Colonel Benton, created an image of buildings inching up in self-defense against neighboring tall buildings that "stole" light and air from the areas around them. Nathan Matthews, in an effort to marshal support for maintaining the boundaries, said

Would you, as public officers, condemn the poor people of this city—the poorer people, those who have to work in offices, to work in darkness... Gentlemen of the commission, this world was created for light. That was the first purpose that was indicated by the Creator when he made it.

Matthews, despite those pleas, claimed congestion was the worst problem facing cities and that tall buildings were adding to the problem.
He asserted that if given his way in 1904 the law then would have held all buildings to a 100-foot limit. That way business would have been more evenly distributed throughout the city, congestion downtown would have been dissipated, and everyone would have benefitted. He said the 125-foot limit was set because so many buildings in the area were already that height; it was not set, as many thought, to distinguish between commercial and residential uses. In other words, the "zoning" of the city into areas of use was accidental. On the other side of the issue was an architect who saw congestion not as a problem but rather a benefit of centralization. He gave an example of a downtown shopper who, with no trouble at all, could go to all of the major department stores in the city.\(^8\)

Fire safety was also assumed to be affected by tall buildings. On the side of keeping buildings low was a fire engineer, Mr. Gorham Dana, who noted that the average fire loss in U.S. cities was $2.50 per capita while in Europe it was $.20 to $.40. It was his opinion that 125 feet was too tall for then contemporary fire-fighting equipment. On the other hand, advocates for taller buildings claimed that building code standards mandated "first-class" construction for such buildings, whereas lower buildings could be "second-class." This raised the
question of whether it was better to have a city of tall first-class buildings or one of lower second-class buildings. Insurance rates were used to show that skyscrapers were not especially dangerous, and indicated, in fact, that some high buildings were safer than many lower ones.8

Discussions on aesthetic issues did not consume much hearing time, though interest was plainly revealed. One occasion for this was when participants were considering changes to the Copley Square regulations. One group that voiced their concern was the trustees of the Boston Public Library. They argued for maintaining the existing height standards in order to help preserve the architectural scale of the library. A point was also made that the city now had a City Planning Board which was concerned with the irregularity of building heights and the fact that they hindered achievement of "the city beautiful."8 This was, of course, a reference to the city beautiful movement, then in good currency. Finally, Edward Warren spoke on the importance of aesthetics and other related matters:

While, of course, individual injustice should always be carefully considered, I think the interest of the whole city at large is one we should never lose sight of. I think questions of light and air, the beauty of the city, things that will make it a better place for all, rich and poor
alike to live in, are questions we should have very much at heart.

Given the make-up of the hearings' participants--mostly businessmen with personal real estate holdings or clients with the same--it was not surprising to find economic issues to be the salient ones. Five such issues were revealed: economic height, real estate markets, property values, equity, and flow of capital.

The economic height of a building is that height at which the return on investment is highest. On the first day of the hearings, George Washburn, president of MREE, commented that nearly all members of the exchange wanted restrictions removed so that a decent return could be made, even if it meant going higher than 125 feet. It was their opinion that limitations were unnecessary because building heights would adjust themselves naturally: investors would not build to a height with an unreasonable return. He pointed out that in New York (where there were then no restrictions) the heights of buildings were determined in this way. Moreover, height restrictions would have kept some buildings from being built in New York, just as they had in Boston. 8

Frederick Woodruff, a real estate broker, claimed that two or three additional stories above the current limits would help raise building
returns from two to four percent to six percent or more. He had run pro formas to check this and had concluded that, under the present limits, capitalists would be reluctant to invest their money in 80-foot, 90-foot, or even 100-foot buildings. Two hotels, the Copley Plaza and the Brunswick, indicated that they thought building higher was more profitable. A Copley representative said its stockholders had "a rather hard road to hoe" under the present height restrictions. The hotel was filled and needed more room, and going up to 125 feet would do the job less expensively than acquiring and building on adjacent property. The Brunswick representative said they wanted the right to go to 125 feet though they would not do it until the character of the area was more firmly established. 8

Nathan Matthews presented research findings to show that higher buildings were uneconomic because of a lack of demand for tall buildings. He pointed out that of the 342 estates in the Boylston Street district, not a single owner had approached the Commission with a desire to build higher. He argued also that going twenty-five feet higher would be damaging to real estate as a whole, assuming that only a few property owners built higher. His logic was that tall buildings stole light and air from shorter neighbors, making them dark, less marketable, and less
valuable. Owners of the shorter buildings would be tempted to build higher—in an effort to regain light and air—when it came time to re-build, but that might not be for many years to come. Presumably, they would not build taller until demand justified doing so. Thus, many suffered for the economic benefit of a few owners of taller buildings.  

Matthews also conducted a survey of Boston's 125-foot office buildings. He found, happily, that there were only seventy-eight, concluding that such a small number "disposes completely of the notion that capital is tumbling over itself to build these 125-foot buildings in the city." He did not reflect on whether the height limitations were the cause of the low number; he simply assumed that a lack of demand was the reason. He looked at those buildings within the seventy-eight which he could find information on to see whether they were profitable. He found common stock prices for twenty (they were held by trusts) but found only four of these selling their stock at par value. The remaining sixteen were selling at an average of $62 on the hundred, representing a loss of some $7,500,000 from first costs. He had provided consultation on another twenty or so of the original seventy-eight buildings and knew that none of them paid an income to warrant selling them at anything near first costs. Finally, by comparing his findings with building and site
characteristics, he arrived at the conclusion that financial advantages accrued to skyscrapers when light was available from three or four sides. In other words, access to light and air, not building height, made buildings profitable. But why build high? Matthews concluded it was for one or more of the following reasons: partly for investment, partly through ignorance, for commercial advertising purposes, to have the family name on a building, because of architects who want to display their talents, and in self-defense of those nearby who might themselves build tall. 8

The opposing view did not let Matthews' case rest. George Washburn noted there was no appreciable opposition to extending district A boundaries and that most evidence was in fact in favor of doing so. Furthermore, if Matthews had looked further he would have found returns on low buildings every bit as dismal as those for higher ones. In other words, the variables affecting building profitability were evidently more complex than building height and access to light and air. Washburn added that the lack of visible, present demand for 125-foot buildings did not bother him; the Commission was deciding for the future, and who could tell what demand it might bring. 8
Matthews, furthering his cause, asserted that property values in Back Bay and along Boylston Street had, since the 1904 restrictions went into affect, jumped forty-seven and seventy-three percent respectively. Additionally, many landowners in the areas had received, according to the law, compensation from the city for value taken. Thus they had benefitted from both an unearned increment on their property and from public compensation.

Washburn countered, pointing out that Matthews had failed to consider what had happened during the same period to property values in district A and other areas of district B. Washburn alleged that district A values had likely increased commensurately and that Back Bay values had more to do with location and prestige than with lower building heights.

One of the more important issues was that of equitable treatment under the height limitations. Some felt it was inequitable for property on one side of a boundary--at most a street--to be subject to a lower limit than that on the other side. A common plea was to eliminate districts and put everybody on an equal basis. A case in point was made by Boston University which wanted to build a 125-foot high education building, but found a 100-foot height limitation on the site. They felt that they should be allowed to build to 125 feet just as property
owners in district A could.

Equity came up also when Nathan Matthews, while reminiscing about how the 1904 limits were set, said that the Commission then was compelled to allow 125-foot buildings in district A. This was because many buildings had been built that high already; it would have been inequitable to keep owners of nearby lower buildings from being able to do likewise. However, Isaac Woodbury asserted that the 125-foot limit was set to please downtown interests—that is, the old estates still holding their money in Boston. Their political clout was, in his view, responsible for keeping the city from being progressive.8

An interesting and related argument put forward by John J. Martin, former president of MREE, was that height restrictions impeded development because they were subject to change. That is, the law lacked predictability. Martin said that property falling under an 80-foot or 100-foot limitation would not be improved if, in a few years, the boundaries might be changed to allow 125-foot structures. He asserted that if boundaries were fixed, landowners would hasten to improve their property.8

One of the purposes of the MREE and BREE was to promote commercial and industrial growth of the city. They felt it should occur unimpeded where it would, not simply in the downtown, district A area. Exchange
members generally felt that height limitations frustrated this goal.

George Washburn pleaded to the Commission to consider the future of the city and give to communities like Dorchester, Charlestown, and South and East Boston the same rights it had given the old families--the downtown interests--of Boston. He found it insulting that Boston was the only large city in the U.S. with a single major business center. Patrick Kyle, a member of the Charlestown Improvement Association, concurred and noted that Charlestown was well-served by railroads and therefore well-adapted for business. He claimed height restrictions were keeping Charlestown from developing the way it should by hindering the flow of capital to that district. Apparently, other districts falling under the limitations were suffering similarly. 8

Height restrictions were also blamed for scaring capital away from and out of Boston, further hampering the goals of the real estate exchanges. Frederick Woodruff, a real estate broker and member of both exchanges, complained that Boston capital was leaving because legislation had ruined the real estate business in Boston. Investors knew they could make more by investing in Atlanta, Kansas City, or Spokane. He admitted that the inability to add two or three more stories to a building was not the only problem; land values in the city were partly
to blame too. His point, simply, was that if investors could realize a seven or eight percent return, the economic growth of the city would be strengthened.8

A related concern was that other cities and states were competing with Boston and Massachusetts for capital investment. This was apparently understood by the state legislature, which was in the process of revising the property tax system, a system blamed for chasing millions of dollars out of the city and state. One who felt strongly about such competition was W.L.F. Gilman. He said that the Commission and others should employ every means available "to give (Boston) a chance to be as big, wealthy, and great as the city that competes with (it)." Vividly portraying the problem of height restrictions and capital investment was a comment made by a prominent real estate trustee who was liquidating all his Boston holdings.

...we are legislated to death, restricted to death, and they have put the screws to us so hard that we are practically screwed to death....

An amendment extending the boundaries of district A was passed in 1916 by the state legislature. Speculation could be made about what swayed their decision, especially in light of a letter from George...
Washburn to the Commission chairman. Washburn wrote that MREE would fight Nathan Matthews "in the most vigorous fashion, and the Commission would be backed up by the most vigorous, progressive, and effective organization in the Commonwealth in all matters pertaining to legislation."

Implied, of course, is that political pressure played a critical role in the extension.

The extension of district A was not the end of development restriction changes in Boston during that time. In 1917, a state referendum to decide whether land use controls should be implemented passed with 161,214 in favor and 83,095 against at the state level, and 34,953 in favor and 8,673 against at the local level. In 1923 the allowable height limit in district A was raised to 155 feet, and in 1924 the 1904 restrictions were superseded by a comprehensive zoning plan. Elizabeth Herlihy said it was difficult to assess the latter's economic impact on the city, but claimed it succeeded in encouraging building development, protecting residential areas, and stabilizing property values.\(^{20}\)

An ironic note on all this is offered by a 1922 letter to the Chicago Real Estate Board (which was that year looking into the question of building heights) from William Chamberlain of the BREE. He wrote that height restrictions were responsible for development of previously
underdeveloped land and for generally increasing all land values. This was, of course, antithetical to the arguments the BREE and other Boston real estate interests had made six years earlier.
Chicago during the last half of the nineteenth century was a boom town. From 1850 to 1870 its population grew tenfold—from 29,963 to 298,977—and by 1871, the city had, for numerous reasons, become the focal point of U.S. commerce. The agricultural potential of the Mississippi Valley was being realized, bringing to the city rapidly growing grain and meatpacking industries. In turn, these brought financial institutions, mills, grain storage facilities, and stockyards. An extensive railway network linked the city in all directions to centers on the east and west coasts. Also developed were waterways. Chicago's ideal location on the Great Lakes, in conjunction with canals which had been dug, were instrumental in making the city an important shipping port. With the rail and waterways came increased shipments of raw materials. Between 1860 and 1871, lumber shipments increased three and one-third times, coal shipments increased six and two-thirds times, and the value
of manufactured iron and steel products increased five times. In short, the city had become a center of agricultural and industrial growth and wealth.

Unfortunately, the fire of 1871 devastated much of what had been built to accommodate this growth. The almost total loss of office space created immediate demand for new office buildings. This demand was successfully met in downtown (the Loop) where, within one year, it had been largely reconstructed with four and five story buildings of brick and stone. Built also were a few buildings of six, seven, and eight stories.22

Economic demands for new buildings and evolving building technologies presented new opportunities to talented Chicago architects. Collectively they came to be known as the Chicago School, an informal group that included some of the pioneers of skyscraper design: William Le Baron Jenney, Louis Sullivan, Daniel Burnham, John W. Root, and William Holabird, to name but a few.2 Jenney's Home Insurance Building (1885) was an early example of the potential of steel-frame construction. Burnham and Root's Monadnock Building (1889) is considered by some to be the first skyscraper, despite its masonry structure. Tall buildings, like these, did not at first meet with overwhelming public acceptance, so
fig. 20: Chicago, Masonic Temple, Burnham and Root

fig. 21: Chicago, Monadnock Building, Burnham and Root
Chicago builders, assuming this hesitancy would vanish, often built to an acceptable and rentable height but overstructured the building to allow additional stories to be added later. It seems that hesitancy turned to acceptance with construction of Holabird and Roche's Tacoma Building (1889). The decade following its completion saw a burst of skyscraper construction in the city including, for example, Burnham and Root's Reliance Building (1890-1894) and their Masonic Temple (1892).

Of Chicago School architects, Louis Sullivan probably stands out as most influential. He saw in the skyscraper and developing technologies new opportunities for self-expression. The steel frame had freed architects from the trabeated forms used since the days of the Greeks and Egyptians and the domed and arched forms of Roman and Gothic times. Accordingly, Sullivan led a campaign to strip skyscrapers of their popular neo-classicist stylings. He desired an unprecedented expression for this new architectural form and for the materials from which it was built.

What is the chief character of the tall office building? And at once we answer, it is lofty... It must be every inch a proud and soaring thing, rising in sheer exultation that from bottom to top it is a unit without a single dissenting line.

Lewis Mumford has criticized Sullivan's statement and stated the reality
fig. 23: Chicago in 1874

fig. 24: Chicago, the Loop more recently
of skyscrapers a little more truthfully:

"...in actuality, height in skyscrapers meant either a desire for centralized administration, a desire to increase ground rents, a desire for advertisement, or all three of these together—and none of these functions determines a "proud and soaring thing."

To Mumford and others—debates of style aside—the bottom line on skyscraper commissions and their architects' creativity was satisfaction of the economic and status needs of a growing corporate elite.

In time, opposition to skyscraper construction in the Loop emerged. Behind the complaints were landowners and merchants outside of the Loop who wanted to see lateral rather than vertical expansion; skyscraper owners who wanted to keep the monopoly on height that they had; and owners of older, lower buildings who protested increased tax assessments and loss of tenants (they were fleeing to the new skyscrapers). These complaints led to early height control legislation. In 1892, an ordinance was passed, but then vetoed, to limit heights to 150 feet. The following year, 1893, a 130-foot limitation was passed that remained in affect until 1902. This limitation increased construction away from the Loop and brought construction in the area to a standstill. As a result, Loop office space was hard to find and demand was high, a situation that brought a fifteen percent increase in Loop rents. To
alleviate the problem, City Council passed an ordinance in 1902 to allow heights of 260 feet.\textsuperscript{22} In 1910, the limit was lowered to 200 feet only to be raised ten years later back to 260 feet.\textsuperscript{35} Unpredictability like this was difficult to deal with. Property owners had had the maximum height limitation changed so often and so arbitrarily that, for them, it was time for something to be done. That something came in the form of a zoning ordinance proposal by the city's Zoning Commission.

THE CREB HEARINGS........

To aid the Commission, the Chicago Real Estate Board (CREB) investigated the topic of building heights. In April 1922, the Zoning Committee of the CREB was directed to establish a Citizen's Committee to hold hearings to find out more about this matter. It was important because the zoning ordinance proposal classified each area of the city into non-overlapping use and volume districts. The latter embodied height limitations. The objective of the hearings was to make equitable and permanent height recommendations to the Zoning Commission.\textsuperscript{35}

The hearings of the Citizen's Committee lasted six months. The study, at the time, was said to be the most comprehensive ever prepared, as Edward Bassett of New York noted: "No city in the United States certainly, and very likely no city in the world, has ever before prepared
The effect of Boston's 1904 height regulations was an accidental differentiation between residential and commercial districts. It did not explicitly control land use, and was therefore not a comprehensive zoning plan.

The first comprehensive zoning plan was passed by New York City in 1916. The ordinance met the requirements of a state enabling act which, in effect, transferred police power from the state—the repository of that power—to the city. This gave to the city the right to pass laws intended to protect the public's health, safety and general welfare; laws that would be constitutional as long as they were not confiscatory, arbitrary, or unreasonable.

The ordinance controlled use and bulk by limiting improvements on property in three ways: regulation of use, building heights, and site coverage. These variables were delineated on three separate maps of the city, so landowners had to refer to all three to know what improvements they were allowed on their property.

Access to light and air was clearly one motivation for the zoning ordinance. In fact, Seymour Toll, in his book Zoned America, comments that the Equitable Building, a forty-two story skyscraper rising straight from its property line, foreshadowed a possibly undesirable New York City environment: "The...Equitable Building carried the development of the skyscraper to such intolerable extremes that, beyond any other structure, it may be isolated as the one building which was the final cause of zoning law." Another motivation for the ordinance was to control density.

The ordinance's height restrictions were based on street width multiples, a system where the allowable height for a building is dependent upon the width of the street that the property fronts and the height district it falls within. There were five districts. The maximum height allowed in each was one of the following: two and one-half, two, one and one-half, one and one-quarter, or one times the street width. The underlying
reasoning of the system was to allow sunlight into streets and the lower floors of buildings. An imaginary line called the angle of light was established. Buildings could step back above the street width multiple height as long as they did not penetrate the imaginary angle of light. This effected the "wedding-cake" forms of early twentieth century skyscrapers in New York. Notably, the angle of light concept had been understood in the days of Leonardo da Vinci and Sir Christopher Wren, but then a reasonable building height was a generous one-half times the width of the street.

There was also a tower privilege. It allowed a tower to any height as long as the area it covered did not exceed twenty-five percent of the site area. The tower and stepping back privileges of the ordinance resulted in striking architectural forms but also in a loss of density control.

New York's ordinance became a model for cities across the country. By 1922, the year the Chicago Real Estate Board was holding its hearings, zoning had spread to New England, to Florida, and as far away as California. Consequently, there were countless places the Board could look for instruction. The state of the art of zoning as they found it in 1922 looked something like this:

**Boston:** passed in 1914
- two classes: A, 125 feet
- B, 80-100 feet

**St. Louis:** passed in 1918
- five classes: 45-foot, 60-foot, 80 foot, 120-foot, 150-foot

**Newark:** passed in 1919
- five classes: 35-foot, 50-foot, 85-foot, 125-foot, 150-foot

**Pittsburgh:** proposed
- five classes: 2-1/2, 3, 6, 8 and 10 story
Testimony was heard from experts on an extensive list of subjects: light and air to streets and buildings, street and transit congestion, fire and panic, health issues, zoning experiences in other cities, and the economic height of buildings. The issues that surfaced were primarily about public health and safety and economics.

Like the Boston hearings, health and safety was a topic of focus, but unlike those hearings, the participants in Chicago heard evidence presented by experts in the field of public health. Again, the major concerns were about light and air, congestion and fire.

Light and air were presumed to be consequential to both physiological and psychological well-being. Professor George C. Whipple of Harvard University, an authority on sanitation, spoke of the far-reaching attributes of sunlight: "Health is more than the absence of disease. It is something positive, and involves physique and vitality, and it is mental as well as physical." Participants addressed directly the sun's ability to kill bacteria. The health editor of the Chicago Tribune, Dr. W. A. Evans, went into considerable depth on the findings of health research on this topic and noted the time it took for the sun to kill certain disease-causing bacteria. Professor Whipple commented on the sun's ef-
fects on mold, fungi, and infection. Furthermore, he asserted that sun-created air movements were important because they carried away germs and bacteria. Discussions on the importance of sunlight were often highly descriptive. The chief sanitary inspector for Chicago saw the lack of it leading to physical problems like eye strain, nervousness, and loss of color, appetite, and weight; mental problems including depression and irritability; and moral degradation, this point based on what the Bible said about men "who loved darkness rather than light because their deeds were evil." Another participant claimed that electric lights, the source of light when sunlight was lacking, had no germ-killing powers and made goods look awful and people look like corpses.

There was another side to the issue. Mr. Tyson, a real estate expert, commented that the causal relationship between skyscrapers, dark streets, and germs was largely theoretical; that electrical lighting and mechanical ventilation had been much improved, thus making the argument of dark and poorly ventilated spaces unjustified; and that skyscraper offices were a refuge away from street dirt and noise, and surrounded by good light and air. Edward Renwick, an architect, asserted that the retail spaces of skyscrapers (the first one or two floors) were in fact better ventilated than similar spaces in lower buildings. His logic
was that tall buildings were like chimneys in that inside air movements cleared the lower floors of stale, germ-laden air. F. W. Fitzpatrick, an architect who had designed skyscrapers and helped establish building code standards to make them safer, felt that as you went higher "the happier is your environment." He added that "ventilation, street cleaning, smoke-prevention, prevention of spitting, etcetera, would not be bettered because of lowering our limits." Moreover, he bluntly questioned the importance of direct sunlight by making the observation that many people tried to avoid it: some tenants preferred north orientations because direct sunlight disturbed their work; curtains on windows with other exposures were often drawn for the same reason; and factories were known to paint over their south-facing windows. Finally, near the end of the hearings, after days and days of discussion on light and air, Fitzpatrick made the important point that street orientation was just as critical as street width and building height, the two variables always considered when light and air were discussed. Other than this one time, street orientation was never discussed and never appeared in early height restrictions.

It was generally acknowledged that skyscrapers increased congestion, but it was not plain whether they deserved all of the blame.
Fitzpatrick said they were simply more conspicuous and that retail uses and legitimate theatres were equally guilty. Dr. Evans, a skyscraper critic, remarked that the increasing traffic volumes in the Loop were having deleterious effects on health, as were other symptoms of congestion. These included dirty streets, spitting, and lack of light and air. He said that things like these increased the occurrence of coughs, colds, influenza, pneumonia, and even more severe problems like tuberculosis, diphtheria, and cerbrospinal meningitis. In addition, they contributed to eye strain, headaches, fatigue, and work inefficiency. Finally, congestion also threatened citizen safety because of the increased number of automobile accidents.

Subways were seen as a cause of congestion and, by some, a solution to it. Edward Bassett believed they were the latter, predicting that Chicago would soon have subways and that they would clear the streets of pedestrians. However, a local traffic engineer, R. F. Kelker, felt subways would multiply the problem. He believed that the number of subways required to get people out of the Loop would add tremendously to sidewalk congestion. Sidney Williams, another engineer, agreed and said that New York's subways were crowded on the day they opened. Furthermore, he noted that the transportation improvements being discussed for Chicago
--double and triple decked streets, and construction of new boulevards--
would only increase congestion by urging more people to buy automobiles
and to come downtown. In the end, these improvements would add to the
taxpayers' woes while making congestion worse.35

Others saw economic benefits to increased transportation and con-
gestion. J.H. Prior, also an engineer, held that transportation was a
responsibility of government and public subsidy by which many benefitted:
the rider who had improved access to places, the landowner who was sell-
ing or leasing property and could thus get a better price, and the indus-
trial interest who could get skilled labor to the workplace easier.
Moreover, congestion was positive and desirable: it increased business
transactions and some people found it enjoyable.

Though forty-five years had passed since the fire of 1871, the
fear of a recurrence was clearly on some minds. Sidney Williams spoke
of the dangers of a fire in the Loop. He alleged that the loss of life
would be increased as a result of fire-fighting equipment being hindered
by traffic congestion and people trying to evacuate the area. He claimed
that fire-resistant construction held little salvation--building contents
could ignite with ease, regardless. Other design features were similar-
ly useless: provisions for egress--like elevators and stairways--were
apt to fill with smoke, fire-escapes were useless above six stories, and installation and maintenance of standpipes was often insufficient. A fire department official, John Plant, emphasized that fire-fighting equipment was ineffective above the fifth or sixth floor and surmised that few occupants of tall office buildings knew the locations of fire escapes and stairways.35

Of course others played down the threat. Bassett claimed that New York's Woolworth Building was as safe as most low buildings, thanks to its modern, internal fire-fighting equipment. Fitzpatrick said the solution to fire prevention was not making buildings shorter but instead compelling owners to make them more fire resistive. He claimed—showing immense personal faith—that in a large fire tall buildings actually protect the buildings downwind!

The economic effects of height restrictions were an important point of discussion, though somewhat less so than in Boston's hearings. Discussions on building economy focused on the question of economic height, again, that height at which the return on investment is maximized. Explained at the hearings were the grounds for the idea: at a certain height additional costs for increased elevator and structural capacity, combined with the rentable space that is lost with these
increases, take away from a building's profitability. Two studies on economic height were presented at the hearings, each rather convincing. Unfortunately the economic height differed for each. The difference seems to be attributable to the fact that one study was a national survey while the other was based on Chicago conditions. If anything comes out of the discussions on building height, it is that it is dependent on local conditions.

The first study was presented by Earle Shultz, president of the National Association of Building Owners and Managers. It was a study of the gross income, net income, and expenses of 185 buildings located in forty U.S. cities. An important trend it indicated was that expenses (gross minus net income) grew at a faster rate than net income, implying that increased expenses would offset increased income at some point. He found that point, the economic height, to be at twenty-four stories.35

The second study was undertaken by an architect (and advocate for lower buildings), George Nimmons. He ran pro formas on hypothetical buildings five to thirty stories in height in five story increments. Given his assumptions and estimations, the economic height of a Chicago skyscraper was twenty stories with a return on investment of about seven percent at that height. Nimmons felt that the risks of skyscraper
Edward Basset confirmed that economic height was variable not just from one city or block to another but also on the same site over time. He commented that experiences in New York had shown that a single twenty-one story skyscraper on a block has a better return than when that block fills up with twenty-one story structures. Additionally, tall buildings steal light and air from neighboring lower buildings, making them less desirable and lowering their returns. Telling the owners of lower buildings that they could build higher did little in the way of appeasing them.35

Testimony at the hearings accused the skyscraper of being a speculator's dream; one noticed by both real estate brokers and city tax assessors. Nimmons hypothesized that property values were inflated when real estate brokers realized that the rents collected from a given piece of property would be higher if buildings were taller. An owner realizing an increased monthly income could then conceivably pay back on a larger debt service. Nimmons implies that property sellers felt this was justification enough to raise property values. He went on to say that higher property values and rents had materialized in all communities where a building considerably higher than the city's average height
was built. It was his opinion that height limitations would curb this cycle of artificial inflation of property values and rents. In other words, if the potential to build exceedingly high was not there, the temptation to raise property values would be eliminated.

There was evidence that height limitations helped property values in other ways. George Mortimer, a businessman, noted that New York's zoning had helped stabilize and improve property values in general. And William Chamberlain of the Boston Real Estate Exchange cited that height controls in Boston had effected a more even distribution of development throughout the city and had helped control great disparities in land prices.

Worth mentioning at this point are insights from another source: Homer Hoyt's *One Hundred Years of Land Values in Chicago* (1933). Careful research on his part showed that prior to Chicago's skyscraper boom land values in the Loop were based on construction of a six-story structure. An impressive, profitable looking financial set-up could be produced if a skyscraper was assumed to be built on a piece of property valued in such a way. This alone was incentive enough for some people to build taller. Further impetus was added by the prestige of building a skyscraper or occupying an office in one. Prestigious buildings and
heights could demand higher rents, further adding to property values. Together, such influences resulted in a marked increase in Loop property values between 1889 and 1891 and culminated in revaluation of all downtown property based on a sixteen-story building sitting on each site; this at a time when twelve to sixteen-story buildings covered no more than seven percent of the downtown district. The slogan of the day became: "Tear down that old rat trap and erect a sixteen-story building!" Even if landowners elected not to, when it came time to sell their property they priced it as if they had, adding more fuel to spiraling land values and building costs. 22

Hoyt points out that the entire Loop could not have gone to sixteen stories without creating an oversupply of office space. In fact, in the early 1890's an oversupply did occur, causing an exodus from older, outmoded properties in the Loop. Based on sixteen-story property valuations, the return for some of these older structures dropped to two percent. Additionally, the concentration of more people in skyscraper areas generated even higher property values, especially when retail uses accompanied the buildings. 22

Looking back, then, it seems that the skyscraper set in motion a spiraling cycle of increased height, leading to increased land values,
leading to increased height and concentration, leading to increased land values, and so on.

Earl Shultz also presented a study indicating a causal relationship between the ups and downs of Chicago's building industry and height controls. His conclusion was that controls slowed construction. He alleges, for example, that the 130-foot limit enacted in 1893 drastically reduced office space construction until 1901 when the limit was raised; and that between 1909 and 1914 the threat of reducing the limit resulted in a flurry of building activity. For the most part, the study was convincing. Still, August Gatzert, a merchant from outside of the Loop interested in seeing stricter height limitations imposed, commented that another decline Shultz had pointed out--between 1914 and 1920--coincided with World War I, and certainly it must have had some effect. Implied by this is that other influences--e.g., economic cycles or, as Mumford has pointed out, a shortage of steel because of armament production--could be partly or wholly responsible for the downturn.

**EPILOGUE**

The mandate of the Citizen's Committee was to help CREB make a recommendation to the Chicago Zoning Commission on the issue of building heights, which it did. The Citizen's Committee itself made no
recommendations, but during the closing days of the hearings George Nimmons, a staunch supporter of lower limits, made his own zoning ordinance proposal. Briefly, it called for height controls based on street width: 180 feet on streets 66 feet wide and less; 200 feet on 80-foot wide streets; and 220 feet on 100-foot wide streets. His proposal also called for tower and step-back privileges. Conversely, the Zoning Commission's ordinance allowed buildings in some areas to go to 264 feet with tower and step-back privileges also allowed. Nimmons maintained that his "moderate" height proposal was better because it would help stabilize land values and benefitted ninety percent of the landowners rather than only a few. 35

The Zoning Committee of the CREB, after some debate, recommended Nimmons' proposal. Attached to the recommendation for these lower limits were a number of considerations, many reflecting an awareness of the public interest: first, public welfare would have dictated even lower heights had that been the only consideration; second, no injustice was perpetrated against land owners since the capacities of streets would be reached far before the city was filled with tall buildings; third, business would be more evenly distributed through the city; fourth, a lower return on investment was realized in buildings over twenty
stories; fifth, by actual count, Chicago's streets were the most crowded in the world; and, sixth, all other cities passing zoning ordinances were reducing their height limitations.  

It was to no avail. The city adopted in 1923 a zoning ordinance designating each piece of property by allowable use and volume. There were five volume districts, each designating a maximum height and volume that could be exceeded under certain conditions. Moreover, there was a tower privilege for each district. The per floor area of a tower could not exceed twenty-five percent of the site area nor one-sixth of the allowable building volume below the tower. The intent of the volume districts was to regulate the height and bulk of buildings, the intensity of use of a site, and to control the amount of open space around a building. The concept of volume districts at first seems quite unique. However, the standards indicate that the volumes are dictated by maximum heights, step-backs, and towers, the same as they were in New York. Worth noting is that controlling the intensity of use (i.e., controlling congestion) cannot be done well by limiting volume or even height alone. Under either system, a developer could simply lower ceiling heights to increase the number of floors, thereby increasing the intensity of use. Clearly, what needs to be controlled are
fig. 27: Chicago 1922 Zoning Ordinance, Use and Volume Districts

Use and Volume District Maps
The use district map and volume district map consist of blue lines in map, the symbols and indications of the districts are shown. The five districts, presented on the map, are districts, districts, and districts. The symbols of the districts, symbols, and indications are superimposed on sections of the use district map. The volume district boundaries and volume district symbols and indications are superimposed on sections of the volume district map.
floor areas.

At any rate, what was the ordinance's impact? Homer Hoyt pointed out that, for one, the Loop's twenty-two story plateau of pre-zoning controls had been marred by twenty or so towers dotting the skyline. Too, increased height limitations in hand with real estate boom years had fueled "building replacement," a practice engaged to increase the economic productivity of a piece of property, even if it meant razing an otherwise good building. Few sites downtown had not been built on at least three or four times, and, in fact, by 1930 seventy percent of the cubage in the Loop had been built since 1900. There were also 5000 amendments to the zoning ordinance granted in the first ten years of its existence. Evidently landowners had had no trouble getting higher and better uses approved if they so desired. In Hoyt's words, the ordinance "did not impose a very serious limit on the use of land."

fig. 30: Chicago, excerpt from 1922 ordinance
Contrary to popular belief, Pierre Charles L'Enfant did not consider building heights in his planning of Washington, D.C., even though he wanted views within the city enhanced. His intentions for these views are manifested in the width and orientation of the main avenues and the use of the city's natural topography to highlight monuments. The earliest expression of the need for height controls originated with President Washington and Thomas Jefferson, then Secretary of State. One of Jefferson's responsibilities in the newly-formed government was to act as liaison between L'Enfant, President Washington, and a three-member commission appointed by the President. This commission was to aid in the city's planning and development. Inquiries by the President and commission on city planning matters received enlightened replies from the well-read and travelled Secretary of State. For example, a November 1790 note from Jefferson commented that Paris had height
controls for houses to make them convenient, easier to manage in case of a fire, and low enough to allow light and air into the streets. In a note from March 1791 he asserts that a similar limit would be good for the Capital.\(^9\)

Continued discussion resulted in the first two building regulations for Washington, D.C. They became effective on October 17, 1791. One stipulated masonry exterior walls and party walls for all houses. This was to help control the spread of fires. The second limited the height of houses to forty feet generally and to no less than thirty-five feet on avenues. The result of the regulations was unfortunate. Houses following their standards were too expensive for most laborers, keeping them from settling in the city and thus impeding the city's development. The regulations were suspended in 1796 and continued to be so during the terms of Jefferson and Monroe. It was not until the end of the nineteenth century that building heights again became a pressing issue in the Capital.\(^9\) The balance of this chapter looks at height regulations enacted for the city during that time.
fig. 32: L'Enfant's plan for Washington, 1877 copy

fig. 33 (above), 34 (right): 1901 planning of the Capital's monuments
Modern height regulations for Washington have their roots in a regulation passed in 1894. A building permit was issued that year for the Cairo Hotel, a 160-foot tall, steel-frame structure. (It is still the tallest privately owned building in the city.) Negative reaction to the approved structure was immediate. The Washington Evening Star of August 27, 1894, remarked that such a structure might be desirable in a "commercial city," but not a nation's capital. The Board of Commissioners for the District of Columbia quickly enacted building height regulations to cut off any tide of similarly tall buildings. The regulations included three standards: first, no building height was to exceed the width of the street it fronted on; second, no building in residential areas was to exceed 90 feet; third, no building in commercial areas was to exceed 110 feet. Not surprisingly, the explicit grounds for the standards were the need for light and air, the threat of fire, the limitations of fire-fighting equipment, and protection of property values.9 The implicit grounds were that as the Capital, Washington's cityscape had to satisfy an important symbolic need; it had to express the city's role as the home of the federal government.

During the 55th Congress (1897 to 1899), the House Committee on the District of Columbia was given the responsibility for questions pertaining
to District building heights. All such matters were to be sent to the Committee for their recommendation, then forwarded to Congress for approval or disapproval if an exemption was being requested. This meant that congressmen, not local officials, decided if taller buildings than allowed by law could be built in the Capital.

In 1899, Representative Joseph W. Babcock proposed a legislative bill to make the 1894 regulations statutory law. The bill included two provisions altering the earlier limitations: first, the 110-foot height limitation for commercial areas was changed to 130 feet on avenues 160 feet wide; second, the limitations did not apply to federal and municipal buildings. In arguing for the bill's passage, the House Committee asserted that skyscrapers were becoming a nuisance in many cities and that the solution was to impose height limits. They noted that Boston and Chicago had done this, setting maximum heights of 125 and 130 feet respectively. The 1899 law was modelled after theirs and went into affect on March 1, 1899.

A bill modifying the 1899 limitations came before Congress in 1910. It allowed an additional twenty feet in height, with height not to exceed 130 feet, for fireproof construction on business streets. This was argued for on the grounds that demand for taller buildings existed
in the business district. The bill met with some opposition, but apparently only one senator wondered if liberalizing building heights would harm the city's beauty. Also, as originally proposed, the bill would have allowed 160-foot tall buildings on a single block along Pennsylvania Avenue. This sparked a public outcry, especially since it sailed through the Senate with little debate, thus appearing to be a case of blatant favoritism. The May 5, 1910 edition of The Washington Evening Star said: "This is the most pernicious form of legislation... (height restrictions) should apply without exception to all classes and all individuals and all blocks, and should not be waived... for the benefit of the favored few." The Star discovered later that a hotel interest had requested the 160-foot limit for the length of the avenue between 1st and 15th, and that somehow this had been misunderstood by the Senate. The bill was redrafted with a 160-foot height allowed between 1st and 15th along Pennsylvania Avenue and was signed into law on June 1, 1910.9

Over the years a number of bills for exemption from the 1910 law have come before Congress. There have been seven in all, of which two are described below: the Harrington Hotel and the National Press Club.
The Harrington Hotel requested an exemption to allow a 130-foot tall building in an area with a 110-foot limitation. Existing in the area were a few hotels of the height being requested. These had been built before the 1910 law was in effect.36 Both Houses of Congress were concerned that allowing the exemption would set a precedent and increase the frequency of such requests, thereby voiding the intent of the 1910 law. The request also surfaced a number of pleas to keep the city's aesthetic qualities intact. A Senator, Mr. King, felt strongly that the city's architectural harmony and beauty would be destroyed if building heights varied too much, and Representative Blanton said the Capital should be "a city of beauty rather than a city of commercial uses." Still, except for a few comments like these, the proposed exemption met with little opposition, an important reason being precedent set by the existing hotels. The upshot was that the amendment passed on January 21, 1925.9

The bill for the National Press Club exemption came before Congress in 1926 and asked to allow a 150-foot building. This was in excess of the height allowed. The arguments that ensued were heated and an administrative idiosyncracy added some interest. Taking the latter first, it should be pointed out that Congress established zoning for Washington,
D.C. in 1920. This law prescribed no height limitations, per se, but gave to a Zoning Commission, also established by Congress, the discretion to set limits as long as they did not exceed those established in 1910. Accordingly, the Zoning Commission put in place 40-foot, 55-foot, 85-foot, and 100-foot height districts.\(^\text{32}\) The district boundaries did not match perfectly the 1910 limitations. The Club's site was simultaneously within 110-foot Commission district and under a 130-foot 1910 limitation. Thus the proposal was twenty feet above one rule and forty feet above another. The final height allowed was 140 feet, halfway between a 20-foot addition to each limit.\(^\text{9}\)

The debates on the exemption were lengthy. The Club's arguments were these: heights of existing buildings near the site were in excess of the proposal (these were built before the law was enacted); light and air would not be cut off from the wide, bordering streets; there were no protests from adjacent property owners; and the proposed height helped maintain a "uniformity of skyline," an important intent of the 1910 building law. These arguments were convincing enough to get the Club what it wanted (almost) but were not so convincing as to vanquish all opposition. Senator King expressed anxiety over the city's aesthetic
qualities. He claimed that the Capital would never be beautiful if greedy interests were allowed too much leeway, that nations were judged by their architecture, and that there is a "universal desire" to have capitals of beauty. He worried too about setting precedents, disclosing that he had already been queried about giving similar privileges if the bill passed. Another Senator, Mr. Harreld, was similarly concerned and asserted that it was unfair to treat one person or group differently from others. If he supported this request he would have to support all others like it. A Representative Hill was worried about a growing trend "to destroy the zoning regulations and other precautions which (had) been enacted in order that the Capital city should retain and develop its unique beauty."

Other Congressmen argued for the exemption. Senator Harrison mentioned that property values had risen in the Capital just as they had in other large cities and that unduly harsh limits would retard development of the city if builders were forced to build such low buildings. Senator Bruce felt a little differently. It was his contention that the city could have been the most beautiful in the world but had missed the opportunity. Since it was too late, burdening the District with stringent height limits would only short-change the material needs of
citizens by restraining the large business interests to which he felt the city was entitled. This was especially important since business was playing an important role in the rapidly growing city.9

The National Capital Park and Planning Commission was established in 1924 to oversee District parklands and help preserve its natural features. These responsibilities were found so linked with other concerns that an act to broaden the Commission's mandate was soon passed. Their responsibilities grew to include, among other things, schools, airport siting, highways, and zoning.33 The Commission looked seriously at zoning and, within that topic, building heights. They found that a trend towards relaxing the city's height limits was having negative impacts, especially as regards access to light and air and increasing traffic congestion. Notably, cutting off light and air--rather than harming health--was seen as injurious to Washington's tree-lined streets, an amenity of consequence given the city's sweltering summers. Traffic congestion, they pointed out, would increase pressure on public services and, therefore, on municipal finances. For example, costly improvements to sewer and water systems and streets and avenues would be needed.33
The Commission also expressed concern over property values and economic equity. The unearned increment enjoyed by recipients of height exemptions were considered inequitable since neighboring property owners were denied for an undetermined amount of time the natural increment they deserved. Such exemptions inflated the recipient's property value and deflated everyone else's, a disparity that was increased further by property taxes which, in the Capital, were based on what might be built rather than what was built. The Commission also saw the exemptions as blighting. They commented on studies of New York skyscraper districts that found such areas enjoyed terrifically high valuations while areas nearby were losing tenants and experiencing disinvestment. Height limits, they said, would keep this from happening, would help maintain the existing citywide property value average, and would allow nominal valuation increases for many landowners rather than extreme ones for a few.

The Commission also expressed interest in the Capital as a national symbol. They pointed out that the dome of the Capitol Building, the embodiment of American government, was fast becoming lost amongst penthouses and water tanks. Their view was that "from whatever direction it is seen the Capitol dome should look down upon the
spectator from a height and dominate the city over which it was intended to preside."

More emphatic in this respect was the Washington Committee of 100, a group concerned with, among other things, the Capital's beauty. They argued that architecture is an index of civilization and that Washington should represent that fact. They said Washington should be the most beautiful capital in the world; it should provide a setting that would communicate to diplomats and tourists from abroad the pride Americans hold for their country; and its beauty should instill patriotism and set an example for U.S. citizens to carry back to their hometowns.

In sum, building height debates in early twentieth-century Washington were simultaneously different and similar to those in other cities. They were different in that the city's beauty and symbolic purposes were of utmost importance in terms of presenting a memorable image of America and its government. Such concerns were primarily of national rather than local interest. On the other hand, it was apparent that building heights were understood to be linked, as in Boston and Chicago, to city development, real estate economics, and health and safety. The fact that they received less emphasis in Washington can be
explained by the Capital's unique position and responsibilities.
CHAPTER 5: TOWARDS THE CITY EFFICIENT

Business came to a standstill in the spring of 1933; the old dreams had vanished and with them all traces of the City Beautiful. A new world was to confront the American people after 1933, and to the City Efficient would now fall the task of trying to solve a multitude of urban problems and of stemming the growing disorder of the urban scene.

ref. 45, p. 234

NEW ARGUMENTS ............... The end of World War I brought with it significant changes to the U.S.'s role in the world. Now a world leader and creditor, many of its most prominent citizens were acquiring international stature and amassing unprecedented wealth and power. Christopher Tunnard wrote of this time:

It was the America of the Jazz Age that loomed so large on the international scene in the decade following the First World War. For the first time Americans were called on to assume responsibilities they had never held before, as they became bankers and manufacturers of the world. J.P. Morgan and Company was working closely with the Banks of England and France; Dillon Read and Company was financing the steel and coal magnates of the Ruhr; and Henry Ford was scattering subsidiaries like seeds over the face of the earth.

Times were prosperous, at least for a while. Though the Depression was soon to come, a building boom brought on by corporate expansion allowed architects to continue designing skyscrapers. Among the many skyscrapers built was the Empire State Building, for many years the world's tallest building. Completed in 1930 and designed by Shreve, Lamb and
Harmon, its 102 story steel frame was erected at the rate of one floor per day, an achievement made possible by superior job coordination and a work force of some 3500. Despite this, the Depression and an oversupply of office space in New York left it largely vacant for many years. Vincent Scully asserts that as such it symbolically marked the end of some forty years of eclectic, Beaux-Arts skyscraper design.45

Skyscraper debates also continued to flourish, and not just in organized debates. Daily newspapers, trade journals, and magazines brought the topic to the public's attention, summarizing the issues discussed in the preceding chapters and raising some new ones as well. One probable reason for the public's interest was simply the growing number of skyscrapers. New York epitomized the trend. In the decade following World War I buildings more than 150 feet tall had been built in the city at a rate of over one hundred per year, and the number of non-residential elevators had reached 15,600.42 Some people were becoming wary of so many skyscrapers and their effects on cities and each other. Henry James, who had been a consultant on the Regional Plan for New York, bemoaned the tendency for skyscrapers to huddle together, driving up property values and thus paving the way for more of their own. He feared a glut of skyscraper space, a commodity difficult to consume quickly.
and impossible to export. It was his opinion that the height and location of skyscrapers, a minority of any city's buildings, had adverse effects on the welfare of the entire city. Henry Curran, a former borough president for Manhattan, cautioned that the growing number of skyscrapers was bringing visual disarray to city skylines and taking away from the beauty of existing skyscrapers. The attractiveness of the Woolworth and Singer towers in New York had been destroyed in this way as had that of the Chicago Tribune Building. He added that the architectural ideals of the City Beautiful movement—e.g., classically proportioned and embellished buildings—were being destroyed by the abundance of tall buildings.

Congestion was also discussed in the press. Raymond Hood, a skyscraper architect, claimed that skyscraper-induced congestion had brought demand for subways to help alleviate the problem; unfortunately, though, new skyscrapers followed the new subways bringing with them even more congestion. Too, property owners began raising property values in anticipation of subway construction that had not even begun, thus setting off the common pattern of spiraling land values. Curran maintained that public expenditures for subways shortchanged other public services like schools, parks, and playgrounds. Congestion and elevators were
also linked. Harvey Wiley Corbett, a skyscraper advocate and architect, alleged that tall buildings saved cities from congestion because of elevators which transferred horizontal movement into vertical. As the argument went, this kept people inside buildings and off of streets and sidewalks. He went on to say that skyscraper districts helped to ease congestion by virtue of densities which put most everyone in the district within walking distance of each other. Thus, even if people had to leave their buildings, at least they did not have to use a car, the source of most congestion.\textsuperscript{6}

The economic height question continued to be elusive. In 1927, the National Association of Real Estate Boards offered a $1000 reward to anyone who could come up with a firm answer. Fred E. Reed, a vice president of that association, said that several factors needed consideration: city size, site value, site accessibility, and the height of surrounding buildings. Implied, of course, is that there is no universal economic height.\textsuperscript{6}

Also in the 1920s, there emerged a notion that skyscraper problems were inexorably tied to densities and open space. Ralph Walker, an architect, posited that skyscrapers would one day dot suburban areas, and that there would be expanses of open space between them.\textsuperscript{18}
Similarly, Henry James said that spreading skyscrapers some distance apart would have definite benefits, for example more light and air and reduced congestion. Finally, a businessman from Los Angeles passed on the experience of a corporation that had moved from the city center into the midst of suburban tranquility: their employees were happier, business could be done more leisurely, and patronage had increased. Ideas about the positive attributes of mixed-use development also surfaced. Raymond Hood, for instance, imagined a skyscraper elevated on columns. The ground floor would be left for walking, motor vehicles, and parking. This would be followed with, first, multiple floors of shops and theatres, then offices, then clubs, restaurants, and hotel accommodations, and above all this (in the sun and fresh air) would be apartments. Mass production of the automobile and the highways it spawned were major forces for cities and regions to contend with. Wealthy families were leaving or moving to new districts within cities, and slowly following them were immigrants finally able to afford housing outside of the poor neighborhoods they had once been herded into. Still, the slums remained. Not everyone could afford to move and those who could were typically replaced by blacks trying to get away from the prejudice of the South. Against the backdrop of changes like these—and the problems they
caused--came a move to better understand the making of cities: a move from the City Beautiful to the City Efficient. This was likely best represented by the Regional Plan of New York and Its Environs. Completed in 1929, the study investigated urban and regional planning concerns like highway traffic, transit, public recreation, neighborhood and community planning, and economics. The concept underlying the study was that the region should be the base for master planning. There was also a growing understanding of the space economy of cities, the best example being a recurring pattern of urban land uses uncovered by Eduard C. Lindeman and Nels Anderson. The pattern was of concentric circles with a city center of high-rent office and commercial uses in the middle. This was surrounded by increasingly large circles of 1) an area of transients, 2) working-class neighborhoods, 3) a ring of single-family residences, and 4) the suburbs.45

Following the Depression were new opportunities and ideas that were to influence the course of American (and worldwide) architecture and planning. For one, the New Deal and the radical political and economic reforms it embodied were born. Among the programs and agencies it brought were the National Housing Act of 1934 and the U.S. Housing Authority of 1937. These provided an impetus for publicly subsidized housing, much
eventually to be accommodated in skyscrapers. The roots of this idea—and countless others that influenced American designers—lie with then contemporary architecture and planning theories emanating from Europe. Like the Bauhaus, most had political and social underpinnings. Additionally, their influence on Americans was abetted by the immigration to the U.S. of some of Europe's most talented designers, among them Gropius, Breuer, Moholy-Nagy, and Mies van der Rohe.

One of the most important architectural theories to come from Europe was Le Corbusier's "five points." These called for buildings to be 1) raised from the ground on pilotis, with 2) roof terraces, 3) free plans, 4) horizontal windows, and 5) free facades. Presented in 1927, these features represented a fundamentally new aesthetic in which buildings were given maximum access to sunlight and air and the ground plane was freed for automobiles, pedestrians, and open space. As noted earlier, some American skyscraper architects were talking of similar possibilities, though their aesthetic expressions were quite different than Le Corbusier's.

Also important at this time were the ideas of Mies van der Rohe. Some of his early proposals presage the majority of skyscraper designs of the last thirty years; for example, his 1921 design for a glass
fig. 38: Le Corbusier's five points, 1927, compared to then contemporary standard construction

fig. 39: Mies van der Rohe, 1922, reinforced concrete building

fig. 40: Mies van der Rohe, 1921 glass and steel skyscraper
skyscraper and a 1922 design for a reinforced concrete office block. He said of these proposals:

The office building is a house of work, of organization, of clarity, of economy. Bright, wide workrooms, easy to oversee, undivided except as the organism of the undertaking is divided. The maximum effect with the minimum of means. The materials are concrete, iron, glass. Reinforced concrete buildings are by nature skeletal buildings. No noodles or armoured turrets. A construction of girders that carry the weight, and walls that carry no weight. That is to say, buildings of skin and bones.

This statement and Le Corbusier's five points capture much of the modern movement aesthetic. The aesthetic was quickly embraced by many American architects but with little if any consideration for the political and social foundations upon which it had been based. Slick and functional, it in time became the style of new American skyscrapers and a new symbol for the country's corporate elite. It was invoked whenever the wealthy wished to present themselves in a progressive and powerful way.16

European theorists also influenced American notions of urban design. One of the most important influences (mostly European but not entirely) was the Congres Internationaux d'Architecture Moderne (CIAM). Formed in 1928, the CIAM was a forum to discuss architecture and town planning.
and the role they should play in helping to improve urban settings.

CIAM's most important discussions on these matters came in 1933 when the group's emphasis moved from a mixture of architecture and town planning to entirely the latter. The document they produced was the Athens Charter, "the most Olympian, rhetorical, and ultimately destructive document to come out of CIAM." One of its 111 propositions proclaimed "the city no longer serves its function, which is to shelter human beings and shelter them well." Much of the blame for this was placed on the profit motive, a goal they claimed ignored any consideration of sound planning principles. Consequently, they called for a cadre of qualified planning specialists to see that such principles were adhered to.

One of the most destructive principles was the rigid zoning of dwellings, recreation, work, and transporation. Today, the negative consequences of this separation of functions are well understood. One of its worst outcomes has been that many areas of our cities are now lifeless and unsafe for much of each day. Another destructive principle was that of a single form or urban housing in "high, widely spaced apartment blocks wherever the necessity of housing a high density of population exists." This formalized a notion that skyscrapers could accommodate housing, whereas previously they had been limited to retail, office
fig. 41, 42: Le Corbusier's Ville Radieuse
and hotel uses.

CIAM's principles were given physical form (at first only on paper) through numerous urban design proposals. These proposals are significant in that they provided an image of how skyscrapers could be incorporated within new urban forms; forms which would purportedly help alleviate many urban problems, including those associated with skyscrapers. The most significant early examples came from Le Corbusier: for example, the Ville Contemporaine (1922), a city for three million that Vincent Scully claims, because of its diagonals and axiality, is a direct descendant of L'Enfant's plan for Washington; the Plan Voisin (1925), a scheme of straight motorways and cruciform skyscrapers that was to be laid over the fine-grained, chaotic pattern of Paris; and Ville Radieuse (1928-1946), an evolving scheme which had as one of its main components dwelling units in skyscrapers. Like Le Corbusier's five points for a new architecture, these had significant impact on architecture and planning. He reveled in the thought of city dwellers enjoying sunlight, fresh air, and "high" living; he saw great potential in the automobile and claimed that "a city made for speed is a city made for success;" he raised buildings to free the land for travel and then created
fig. 43, 44 (above): Le Corbusier, 1925, Plan Voisin

fig. 45, 46 (below): Le Corbusier, 1922, Ville Contemporaine
hierarchical street networks; and he promoted the notion of towers in vast, green open spaces, an idea with urban form consequences antithetical to traditional patterns of blocks and street walls.

In sum, the effects of these ideas on cities have been stupefying. One important outcome has been highrise housing, a trend which picked up in the U.S. and Europe after World War II. Among early U.S. examples were Metropolitan Life's Stuyvesant Town (1947), a project for middle income families, and the Alfred E. Smith Houses (1948), a low-cost public housing project. This pattern of housing was accepted uncritically at the time, with little thought given to its social and behavioral impacts. Such concerns, well-known today but maybe still not considered enough, include problems of child rearing, resident safety, increased segregation of the poor (usually minorities), and effects on existing neighborhoods. As such, highrise housing has been an important focus of man-environment studies and numerous debates. For example, these issues were critical in stopping Cedar-Riverside, a large-scale, mixed-use development in Minneapolis.

Another outcome of Le Corbusier's projects has been countless large-scale redevelopment projects. Regarding American examples,
Vincent Scully has said

Cataclysmic, automotive, and suburban: these have been the pervasive characteristics of Urban Redevelopment in America...they are exactly in accord with the most persistent American myths and desires: the city is bad, tear it down, get on the road, be a pioneer, live in Greenwich like a white man. So redevelopment became a way to appear to plan but not really to plan. It encouraged all kinds of forces that existed; real-estate men, automobiles, and so on, and it came to function as such forces suggested or required.

Redevelopment has been indulged in with great zeal and has come to be criticized for numerous reasons: it tends to destroy existing social patterns, encourages jarring physical discontinuities, increases traffic congestion, requires larger streets and highways to service it, inflicts environmental impacts, and so on. In the U.S., redevelopment is sometimes associated with public housing for the poor but most often associated with large-scale commercial and office ventures. The latter, in particular, has brought an onslaught of skyscrapers and changes to American cities and has given an ever-increasing visibility to powerful, corporate interests.

In sum, despite the early debates, skyscraper construction has flourished largely to satisfy the ever-present corporate needs of expansion and prestige. Skyscrapers have also found new usefulness in the form of highrise housing. Architects and planners, rather than
trying to restrain skyscraper construction, have acknowledged their problems and developed theories of city design to (supposedly) incorporate them in sensitive ways. Today, it is widely recognized that these theories have fallen far short of expectations, resulting not only in more skyscrapers but also the host of problems mentioned above. As the problems have persisted, so have the debates.
The old city grew beautiful by accident, the new one is growing ugly by design.

San Francisco is blessed with a beautiful and distinctive setting: a hilly peninsula surrounded by the waters of the Pacific Ocean and San Francisco Bay; rolling hills which afford views to the land and sea and help create places with their own identities and meanings; special places like Nob Hill and Telegraph Hill which are known to resident and visitor alike. Herb Caen, a journalist, has commented on the residents' feelings:

"The San Franciscan never tires of looking at the face of his city...There is always a stray strand of fog across the sun to cast a new light over the rambling hills. The San Franciscan likes to look at his own city, as though to remind himself of his singular good fortune."

The city's gridiron street plan confronts the natural topography to produce the steep streets the city is famous for. Historically, these have been lined with low buildings known for their ornateness and human scale. Development in the city is also very dense. The city's 700,000 residents are packed some 16,000 per square mile, making it,
fig. 49: San Francisco, districts and landmarks

fig. 50, 51 (below): San Francisco, density, texture, and detail
next to New York, the second densest city in the U.S. Another important feature is the city's open space. Parks and public lands are irreplaceable, but more immediate are, again, the streets. The views, sunlight, air, and space for strolling they provide are, for some neighborhoods, the only place these can be enjoyed. According to Alan Jacobs, former director of the city's planning department, the care people give to their houses and front yards attests to their care for the streets and the city.

Caring for the city has manifested itself in many ways. For example, residents struggled for some fifty years to save and restore the Palace of Fine Arts. Deep-felt concern for the quality of urban life and respect for the city's heritage is also testified to by things like neighborhood sponsored downzoning, an anti-freeway movement, opposition to BART, an increased interest in preservation, and, important to this study, the opposition to skyscrapers and their effects on the city's cherished skyline.

Skyscrapers have replaced the hills, views, streets, and fine-grained neighborhoods as the dominant element in the cityscape, and as such have been the focus of heated, citywide debates over who the city is for and the kind of place it should be. The debates, likely the most divi-
sive of their kind in recent U.S. history, had sides roughly drawn between corporate interests (and the politicians that catered to them) and almost everyone else.

The corporate elite of the city were, and presumably continue to be, interested in seeing San Francisco maintain its position as the cultural and financial center of the Bay area and seeing it establish itself as a gateway to Asian markets. This last goal was apparently clinched by 1970 when a report by the Wells Fargo Bank claimed that the "most important stimulus to San Francisco's economic base has been increasing involvement in this century in Asian geopolitics." Success in this respect was confirmed by increased volumes of exports moving through city customs between 1964 and 1968: a 35 percent increase to the Philippines, 61 percent to Japan, 80 percent to Australia, 171 percent to Thailand, and 300 percent to the Republic of Korea. Significantly, the same report boasts that between 1965 and 1968 the value of skyscraper construction in the city hit $256 million, three times that for all of the 1950s. Most was attributable to the city's largest landowners and taxpayers; for example, the Bank of America, Transamerica, The Wells Fargo Bank, and Bechtel. The development they promoted helped centralize banking, insurance, and commercial activities downtown."
An important component to all this was BART, dubbed at the time "the largest single act of urban design currently underway in the United States." Sold to the public as an anti-smog, anti-traffic alternative to the automobile, its most important attribute was the ability to get workers and shoppers to the central business district and its skyscrapers. In short, BART was to be good for business. It would invigorate downtown activity, thus bringing about higher land use and increased densities, non-residential employment, and property valuations. According to a former San Francisco mayor's son, the city was to become another Manhattan.

The fear that the city would be "Manhattanized" was critical to raising opposition to skyscrapers and, secondarily, to BART. Too, it was an important stimulus for development control measures enacted in the late 1960s and early 1970s. During this time, large-scale development increasingly met with public opposition. For example, in 1968 there was public outcry over a development that would have ruined views to and from Coit Tower. By that time the impacts of such development were becoming well-known: shadows, widened streets, increased traffic, loss of historic landmarks, and destroyed views were unfortunately all
plausible. People were also becoming increasingly sensitive to the
destruction of the city's Victorians and the "plastic" apartments put
up in their places. In sum, there was a growing concern for the social
and physical excesses of large-scale development, for conservation of the
city's heritage, for the effects of rapid growth, and for the form of
the city.

In the 1960s, maintaining the physical attractiveness of the city
was an ad hoc affair, primarily because there was no citywide plan
against which to check development. In response to this shortcoming,
the city implemented three development control measures aimed at bal-
ancing public and private interests: the downtown zoning plan, the urban
design plan, and a height and bulk ordinance. The first was not city-
wide but the other two were.

The downtown zoning plan was put in place in 1967. Among its pro-
visions were a reduction in prime office and commercial space, a re-
directing of such space towards transit stops and away from residential
and historic districts, height limitations in critical areas (some for
the first time), development bonuses for plazas and transit stop links,
and reduced development intensities through a lower allowable floor area
ratio--14:1 instead of 16:1. Unfortunately, bonuses could accrue to
a ratio of 24:1. This was hardly in line with lower development intensities and prompted Alan Jacobs to say that Manhattanization was still possible. But in defense of the plan, he also noted its laudable goals: downtown should be compact and transit-oriented; its retail continuity should be retained where possible; parking should be kept away from its center; and the number and size of downtown office buildings should be reduced. 23

Although an important first step, the downtown zoning plan did not address citywide urban design issues. To better grasp these, the city planning department embarked on an urban design plan in 1968. They began by commissioning eight preliminary reports and three special studies on topics like street livability and urban design principles. Compiled between December 1968 and October 1970, the reports and studies had the dual purpose of, first, informing citizens and decision-makers and, second, encouraging interest and support. 23 They succeeded, but equally effective were the skyscraper controversies raging in the city. For example, the Transamerica Building and a waterfront highrise proposal by U.S. Steel both helped raise the public's consciousness and anger.

In 1971, three years after the urban design study was begun, a plan was passed with overwhelming public support. Worth noting is the
The relationship of a building's size and shape to its visibility in the cityscape, to important natural features and to existing development determines whether it will have a pleasing or a disruptive effect on the image and character of the city.

In brief, the urban design plan addressed design quality through objectives, principles, and policies for four major areas of concern: city pattern, conservation, major new development, and neighborhood environments. Also included were preliminary height and bulk limitations. Bulk was important to control since wide buildings could block views and could, depending on their context, be out of scale with built and natural forms. The height limitations were expressed as ranges which were to provide a starting point for establishing specific limitations, these to be completed within six months. When complete, they would become part of the city's zoning ordinance. The principles behind the preliminary ranges were straightforward: tall slender buildings on top of hills can emphasize natural land forms; selectively placed tall buildings can aid orientation within the city; tall buildings should...
not block views and should be harmonious with the scale and character of their contexts; and, in keeping with existing patterns of development, buildings along the waterfront should be kept low.\(^{24}\)

The preliminary height limitations met these principles. There was an overwhelming 40-foot limit throughout the city with taller buildings allowed on selected hills and near activity centers (e.g., transit stops). Lower buildings were designated at the base of hills and in valleys with, however, one exception—downtown. An unlimited height was allowed there, supposedly to permit tall buildings to cluster and form a man-made hill.\(^{23}\)

Some cities deal with height and bulk on a discretionary basis in order to have flexibility in responding to special conditions and to encourage more desirable outcomes. But in San Francisco, such open-endedness would have left the possibility for higher and more intense development, an end to be avoided since it would lead to another confrontation. Accordingly, the interim height and bulk ranges were to be reviewed publicly so that specific limitations could be set.\(^{23}\)

Public response to the preliminary limits revealed a certain amount of discontent. For one, people were shocked to discover that these were the first such controls for many areas of the city. Additionally, there was a sense that the limits were too lenient—the sentiment for
stricter controls was surprisingly widespread. For instance, residents of Russian Hill (where towers had been allowed under the urban design plan) became dissatisfied when they more fully understood the consequences of towers in their neighborhood. As a result, they demanded a 40-foot limit for the district. There was little testimony favoring height increases, except in a couple of instances near transit stops and from a few individual property owners. Downtown interests were primarily concerned that the planning department valued aesthetics much more than economics and that the department had too much discretionary power. Knowing that the height limits would be fixed helped in this last respect.

As enacted, the height and bulk ordinance was molded to fit public desires, with a total of twenty-seven height districts designated. In general, the limits were scaled down from those proposed in the urban design plan. The most notable change from the plan's original principles was elimination of towers for visual emphasis of hills.

Still, ardent skyscraper opponents felt immense frustration over the urban design plan and the height and bulk ordinance. They argued that the regulations catered to business interests that were bent on
destroying the city as it was. Their position on the subject is con-
tained in The Ultimate Highrise, a collection of articles and research
findings aimed at building a strong, anti-skyscraper constituency.

Another set of research findings comes from a group formed in 1943,
the San Francisco Planning and Urban Renewal Association (SPUR). Ac-
cording to the opponents' own description, SPUR is a moderate, private-
ly financed citizens group usually sensitive to development issues in
the city. They purportedly take a citywide view of design, land use,
and environmental planning issues. In the interest of pinning down
tall building effects, they organized and published a study, the Impact
of Intensive High Rise Development on San Francisco. It covers a di-
verse range of topics and is structured around five scenarios. Scenario
#1 is a status quo representation of the city in 1974. The other four
represent forms the city might take by the year 1990, and vary by the
amount of growth (high versus low) and height of development (existing
limits or a more restrictive 160-foot limit). More specifically:

Scenario #2: postulates 10 million square feet of new office
space, 4,600 new hotel rooms, all built under the existing (1974) height
limitations.

Scenario #3: postulates 30 million square feet of new office
fig. 53: SPUR study element flow chart

fig. 54, 55: two SPUR study scenarios
space, 6,600 new hotel rooms, all built under the existing (1974) height limitations.

**Scenario #4:** postulates 10 million square feet of new office space, 4,600 new hotel rooms, all built under a new height limitation of 160 feet.

**Scenario #5:** postulates 30 million square feet of new office space, 6,600 new hotel rooms, all built under a new height limitation of 160 feet. 36

Following, then, is a summary of the findings and arguments of the aforementioned sources. Together, they surfaced four major areas of concern: safety, quality of life, aesthetics, and economics.

Comments on skyscraper safety issues were about fire and earthquakes. These have special significance to San Franciscans because of the Fire of 1906 and the city's location in an earthquake zone.

Highrise opponent Michael J. Cussen, in *The Ultimate Highrise*, claimed that new skyscrapers are more dangerous than old ones, mainly because of the plastics used for interior furnishings and finishes; that the fire department ladders are too short, making many fires inaccessible to firefighters; that fireproofing is inadequate; and that vertical shafts within tall buildings allow smoke and heat to move...
easily throughout. He alleged that it was only a matter of time before a disastrous fire struck. SPUR dealt indirectly with the threat of fire by addressing the cost of fire fighting. Contrary to what opponents argued, SPUR noted that national and local trends indicated a decrease in the frequency of fires in highrise areas; that new codes compelled better construction for such buildings; and that over the years, San Francisco would become safer. The reason for this was that newer, fire-resistant construction would supposedly replace older, fire-prone structures.36

Living in San Francisco instills one with respect for earthquakes. Skyscraper opponents are quick to point out that it was not until 1947 that the city required earthquake resistant design for buildings and that in 1969, five buildings built to these standards collapsed in Caracas, Venezuela. Investigators from the San Francisco Bay Guardian dug into old records and came up with a long list of buildings which did not meet these standards, but they found local officials reluctant to condemn them since doing so would take them off of the city's tax rolls. The SPUR study only mentioned earthquakes in passing, remarking that human life and material damage are the two things to be most concerned with.36
Quality of life issues in San Francisco were of great concern, especially to the SPUR researchers. It is important to note that such issues, for the most part, were not significant in the earlier debates in Chicago, Boston, and Washington. They became more so during the intervening years as certain issues—like public health—took a somewhat lower profile. In addition, the breadth of skyscraper impacts grew and came to be better understood. Included among these are environmental impacts (wind, noise, and air quality) and social behavior impacts (use of open space and livability).

A frequent complaint of tall buildings is the wind conditions they effect at street level, conditions which are uncomfortable and can be dangerous. Through mathematical models, the SPUR researchers tested the effects of buildings likely to be built under each scenario. The findings show that buildings can either provide shelter from the wind or make conditions worse; that the severity of winds at the base of tall buildings depends on the dimensions and placement of buildings around them; and that taller buildings produce worse wind conditions than shorter ones, but that 160-foot buildings (i.e., scenarios #4 and #5) are still tall enough to induce severe winds.36

The SPUR researchers were also concerned with noise. They isolated
two kinds linked to urban development: that generated by increased motor vehicle traffic and that generated by increased construction. Traffic noise intensity, duration, and size of area affected all grew with increased development. The most important variable was not the height of a building but the amount of office space it accommodated. Not surprisingly, they found that traffic noise can disturb sleep, interfere with conversations, and, if excessive, impair hearing. As for construction noise, the form of new development was important. Taller development (like that in scenarios #2 and #3) generates such noise for a longer period, whereas lower, more spread-out development (like that in scenarios #4 and #5) distributes the noise over a greater area. Except for the busiest streets, construction noise was found worse than traffic noise and, like traffic noise, could lead to hearing impairment and speech interference. It does not disturb sleep as much as it is generally limited to the daytime.

Researchers organized by the San Francisco Bay Guardian found that skyscrapers cause vast amounts of air pollution which, when linked with water pollution, would cost the city $1 billion to clean up (no time limit given). They did not pinpoint the sources but blamed a good portion of it on commuter (i.e., non-resident) congestion and on the long-
term effects of BART. They said the latter would make air quality worse because the system's capacity was limited and it would stimulate skyscraper construction. Together these implied a dramatic increase in congestion. The SPUR researchers looked at air quality at a more local level—that is, what happens to it around buildings themselves. They found more sources of air pollution (i.e., more congestion) with scenarios #2 and #3, the taller, denser development forms. This meant higher carbon monoxide levels in these cases, a particularly harmful situation under stagnant air conditions. They found, however, that gentle wind conditions flushed air pollutants more effectively from around tall buildings than from around low ones. Finally, they expected levels of pollution to decrease as more automobiles became equipped with emission control devices.

As urban areas become built up, the open spaces afforded become increasingly valuable. With this in mind, the effects of skyscrapers on open space use was investigated by the SPUR researchers. They were interested in four determinations: first, whether tall buildings affect the areas served by open spaces; second, whether the use levels of such spaces were related to their visibility; third, the user's perceptions of highrise impacts (e.g., wind and shadows) on open space character;
fig. 56, 57: examples of SPUR's open space studies
and fourth, the impact of the various scenarios on the city's open spaces.
Among the things they did was map use patterns and service areas for six
parks and two plazas. Regarding their questions: use areas were affected
in that fewer people "behind" highrises used the open spaces; people who
cannot see such spaces from home or office use them less often; highrise
impacts on open space affect the very amenities users are seeking, for
example, sunlight; and scenarios #2 and #3 (the taller, denser scenarios)
would be most detrimental to open spaces since they created the highest
demand within the most limited area and, by virtue of their height, pro-
duced the most negative impacts. 37

The SPUR researchers also investigated the relative livability of
highrise and lowrise residential blocks (a highrise block was a mixture
of high and low residential buildings while a lowrise block had only
low). They were interested in the continuity between individual dwelling
units and the rest of the block (i.e., the residents' sense of territory)
and in the tensions between neighboring behavior and personal privacy.
It was their hypothesis that tension and continuity were affected by
highrises in residential areas in these ways: they increase the densi-
ties of people and motor vehicles; they produce dramatic physical changes
in terms of size, design, and symbolism; they close down views and
openness; they overlook their lower neighbors; and their residents are often demographically distinct. They found that one-third to one-half as many outdoor activities occurred on highrise blocks even though two to four times as many people lived on them; that lowrise blocks had three times as many conversation groups and people engaged in maintenance tasks, two times as many residents relaxing, and two times as many children playing outdoors; and that there was a discernable increase in pedestrian and vehicular traffic on highrise blocks (resulting in streets less likely to be used for activities other than driving). In sum, they found highrise blocks less livable.

Debates on aesthetic issues were unexpectedly scarce in *The Ultimate Highrise*. What was mentioned was better covered in the SPUR study, which investigated views and citizens' impressions of the city. Views were addressed by looking at blockage of existing and creation of new view opportunities by tall buildings, and by looking at who benefitted and lost under a variety of conditions. Specifically, the researchers analyzed nineteen building heights between 80 and 550 feet above sea level. The results: existing views accrued to those residing in the upper floors of downtown highrises and those on Nob Hill; scenario #3 (the high growth, taller scenario) obstructed more existing and
provided more new view opportunities than the others; the greatest number of new view opportunities under all scenarios went to downtown office workers and visitors to the city (i.e., an abundance of non-residents) while the greatest losses were suffered by those living on Nob Hill and those in the lower floors of buildings downtown. The most direct relationship which emerged was that the higher new construction is, the greater the loss of existing view opportunities. 36

The researchers surveyed workers and residents for their impressions of the city's skyscrapers to find, first, what they were and, second, how they jibed with the scenarios. Aesthetics were found to be the most important evaluator of citywide quality, and the taller scenarios, #2 and #3, were found frequently at odds with respondents' aesthetic sensibilities. Their most frequent complaint about the city's highrises was a "loss of unique San Francisco character," and the preferred vantage point for viewing highrises was from far away. At the district level, aesthetics were the main criteria for judging neighborhood quality (eighty-four percent) and commercial district quality (seventy-five percent). Most respondents (sixty-two percent) said they would avoid living in areas with highrises. It was also found that what passed for a highrise was not tall by today's standards: the median definition height was 14.7
Included in the survey were open-ended questions to elicit impressions of skyscrapers. On the positive side were statements like:

- feeling of progress in the finest city in the world,
- sense of being within a city,
- multiply access to view, sun,
- magnificent profile of towering high-rise buildings,
- rather than small, low flat old buildings that remind me of the past and old days.

And on the negative side were statements like:

- I remember the very beautiful view I used to have,
- shut out light and air,
- bring more traffic,
- bleagh--let New York have them,
- money talks, that's all there is to it,
- launch Transamerica pyramid into orbit and plant a giant Redwood tree in its place

The economic issues which surfaced were quite different from those at the turn of the century. There was not, for example, any debate on the economic height of buildings nor much on tall buildings' effects on property values. To believe these subjects were unimportant is misleading; their lack of visibility is a result of the sources of information and the fact that the issues are subtly buried within others. At any rate, the economic issues discussed included employment and municipal costs and revenues.

A former mayor of the city, Joseph Alioto, said "we need tall buildings because they give us jobs and taxes. Like others, he assumed
High-Rise Descriptors - Positive

a sign of the big city
necessary to life of a big city in restricted area
feeling of progress in finest city in the world
I like them; it gives the city a majestic look.
High-rise is a part of the urban scene; part and parcel of city's life.
Gives me the feeling of living in a City.
High buildings...is a city, not a town.

Without downtown highrises there would be no downtown (other than a Milpitas main street).
Looks good in downtown area; high-rise should be restricted to downtown area.
Don't mind them in downtown area. They are economical and useful there - providing they are not giants.

Riches of this country
increasing importance of San Francisco in world finance and trade
San Francisco becoming headquarters city
teeming pulse of San Francisco financial center (2) (1)
center of commercial activity (2)
San Francisco financial center of West (3)
West Coast Wall St.
distinction of San Francisco from other cities
I like the big buildings; gives me a feeling of being in N.Y.
catching up to New York big city look
sense of being within a city
Makes me feel I am in a metropolitan area.
how skyline and general appearance of San Francisco has changed in past 20 years

multiply access to view, sun
getting views for occupants
They stabilise the wind.
add to the overall beauty of the entire city
enjoy a few of the new buildings
I happen to like high-rise buildings.
I like the new buildings with plazas and some greenery.

High-Rise Descriptors - Negative

no view left
destroys view
obstructs view (10)
views blocked (22)
views closed
cut off view (8)
cut off vistas
spoils view (3)
taking view away (3)
encroach on many people's view (2)
close off air and view
block scenery
obliterates scenic view
cannot see the Bay (3)
unpleasant to look at (32)
I remember the very beautiful view I used to have.

high-rise very unpleasant to look at and destroy what might otherwise be a pleasant view

less sunlight
shut out light and air
Sun can't get to streets. (2)
shuts out sun (3)
loss of sunshine
blocks sunshine
cut off sunshine (3)
cut out sunshine (2)
blocks sunshine (3)
cut off light (3)
blocks out sky
never sunny
obstruct light
evelope smaller buildings
shadow other buildings
Makes it dark in daytime.
Living space on the dark side would be like a grave.

full of corridors of wind
cause downdrafts
make wind tunnels (5)
(Dislike viewing high-rises on windy, shady side (because) so goddamn cold and windy, any view is foul.

(1) Frequency of mentions.

fig. 58, 59: examples of impressionistic responses to San Francisco's skyscrapers, the SPUR study
skyscrapers would bring employment to the city. Greggar Sletteland, writing for *The Ultimate Highrise*, asserts that such logic is akin to saying highways provide transportation--the cause and effect relationship is not all that clear.\(^5\)

Sletteland complains that skyscraper advocates have a short-sighted view of employment generated by skyscrapers: they fail to assess honestly who gets the jobs and the kinds of jobs they are. Advocates in San Francisco asserted that skyscrapers provided numerous support jobs like bellboys, retail clerks, and restaurant employment, as well as technical and professional jobs. Sletteland disagrees, pointing out, first, that service jobs are dead-end and poor substitutes for the secure blue collar jobs lost when the skyscrapers came, and, second, that most of the increase in service jobs comes from tourism and health care. He alleges that only twenty-five percent result directly from the business sector and, moreover, that skyscrapers will destroy the reasons tourists come to the city. He points to a noticeable decline in tourism during 1969 and 1970 and remarks that, should the trend continue, a lot of low-skilled jobs would be lost.\(^5\)

Sletteland also looks at the relative strength of employment sectors. He cites that during the 1960s the total San Francisco labor
force moved up 60,400 with white collar jobs accounting for nearly seventy-four percent of the increase. Furthermore, a disproportionate number of those jobs went to people commuting to the city, while few went to the city's underemployed. He claims that such dramatic jumps in white collar jobs have a negative impact on blue collar jobs: new offices drive up property values and taxes thus forcing manufacturing and trade industries out of the city. As evidence, he points to a decrease in blue collar jobs of some 14,000 during the 1960s, a decade of unprecedented skyscraper construction in San Francisco. Further frustrating this trend was urban redevelopment which was eliminating smaller, more marginal businesses.

The findings of the SPUR study corroborated some of Sletteland's, though their numbers were sometimes different. They agreed that the 1960s had brought a decrease in the city's manufacturing jobs (they said 13,000) and an increase in central business district jobs. One shocking statistic was that employment for the county (including the CBD) had risen by some 60,000 while that for the CBD alone had risen 80,000, an indication of phenomenal growth in finance, insurance, real estate, services, and government. However, the SPUR researchers took a less calloused view of these changes. They agreed with Sletteland that
highrises do not by themselves create jobs. But instead of blaming highrises for altering employment opportunities, they were inclined to say that changing employment opportunities effected increased highrise construction. But they were quick to note that a simple one-to-one relationship between the two did not exist. For example, for one five year period (1969-1974), three times as much office space had been built than the increase in office jobs called for. They explained the slack, in part, through changing vacancy rates, changing standards for office worker space, and demolition and underutilization of existing office space.  

SPUR researchers also tracked the breakdown for office, hotel, and construction employment under each scenario. Not surprisingly, each was higher under the high-growth scenarios, #3 and #5.  

Who works downtown? Though an oversimplification, the SPUR researchers found that the prototypical office worker in 1974 was a thirty-five year old white male, married, and without children. He lived outside of San Francisco and commuted to work via public transit to a $14,000 per year professional or technical job. The prototypical hotel worker in 1974 was a thirty-six year old white male, married, and without children. He lived within San Francisco and commuted to work via MUNI to a $7,100 per year service job. SPUR researchers said the city's
expanding office sector reflected demographic trends. Though not indicated by the prototypes above, the trends were towards a younger population, less likely to marry, and with fewer children for those that do.  

The effect on city coffers is indicative of whether skyscrapers are a benefit to a city—is there a net gain or loss when costs and revenues are tallied? The answer to this question varied for The Ultimate High-rise and the SPUR studies. The former found that skyscrapers were an economic liability for San Francisco. Their research showed that the downtown highrise district cost the city $5 million more in 1970 than it produced in revenues; that the district's proportion of the city's property tax revenues had dropped by sixteen percent compared to what it had been before the skyscraper boom of the 1960s; and that transportation costs to service the skyscraper district would total some $5 billion over the next ten years.  

One opponent, Michael Metcalf, claimed that those who argue that highrises widen the tax base are misled (or lying) if one considers that skyscrapers simply reaccommodate office workers already in the city. He claims, too, that the property tax paid per occupant is lower for skyscrapers. As an example, he notes that the Bank of America building paid taxes equal to $638.70 per occupant but replaced a number of lower
buildings which, when totaled together, paid $660.57 per occupant. He underplayed the fact that the bank building's occupancy level of 5,000--and growing--had replaced 425 workers. Metcalf also noted that the CBD's portion of the tax base had decreased over the years.5

Greggar Sletteland brought up the issue of the costs of increasing density, noting that former New York Mayor John Lindsay claimed that high density "is responsible for inevitably higher costs for every conceivable service." Such was born out by statistics presented which indicated that per capita expenses for public expenses increased as population and density increased. For example, Sletteland points out that the highrise district took 22.9 percent of the fire Department's budget but only occupied 3.4 percent of the city's developable land. He did not remark that the central business district accounted for 20.8 percent of the city's assessed value.5

The SPUR study, on the other hand, found fiscal benefits to all four scenarios. They compared the scenarios by focusing on three questions. First, what would be the net effect of costs and revenues? If the net was negative, the new revenue sources would have to be found. Second, even if revenues exceeded costs, would the level of development exceed existing municipal service capacities? If it did, then infra-
structure improvements would have to be financed, possibly offsetting otherwise beneficial gains. Third, would height limits for new office and hotel construction help avoid reaching these capacities? In other words, are height controls fiscally effective.36 Regarding the first question, revenues exceeded costs for each scenario, but the surplus was greater for #3 and #5, the high-growth scenarios. As for the second question, no scenario exceeded existing municipal service capacities. And as for the third question, slightly greater fiscal benefits accrued to the taller developments when judged against the comparable lower ones. This was because taller development resulted in less demolition of existing tax-producing properties and had higher construction costs, thus increasing the property taxes that could be assessed against it.36

Looking at municipal costs, SPUR research did not substantiate the soaring costs claimed in The Ultimate Highrise. In fact, increases were rather low. One reason was because many contemporary hotels and offices provide in-house police and security, thus relieving the city of those responsibilities. SPUR also established that police costs did not increase with higher buildings, a claim made by some skyscraper opponents. Fire protection costs were found to be fairly stable since modern architectural and building code standards compelled generally fire-resistant
construction. Sewer cost impacts were minimal under all scenarios, a point explained in part by a capital improvements program then in the process of upgrading the existing system. Water service costs were also largely unaffected—from the city's fiscal view—because the water department is an independent agency which collects its own user fees. Finally, school costs were slightly higher for #3 and #5, the high-growth scenarios. 5

EPILOGUE

The more pertinent urban design implications and recommendations suggested by SPUR are worth mentioning. For one, the lower height scenarios were found to affect more than twice the area of the comparable taller scenarios (i.e., comparing #2 to #4 and #3 to #5). However, the lower ones would not significantly harm historic districts whereas the taller ones would harm them visually. The economic benefits from all of them were comparable (and positive), but the lower ones had fewer negative environmental impacts—for example, sun, wind, and open space use. Also, the SPUR researchers were critical of the city's regulations which they alleged did not consider the pedestrian environment as well as they might have. The study recommended that an overall downtown open space and pedestrian walkway system be designed which all subsequent development
would have to adhere to. Where has all the debate and research on San Francisco skyscrapers led? Apparently, years of controversy, untold costs for studies, and one of the most admired urban design plans of recent times have done little to dim the process of Manhattanization. This was attested to by Sally Woodridge, who said in 1980 that "nearly ten years of unchecked development had confirmed environmentalists' worst fears." In 1979, because of this continued development, another referendum to limit the height of buildings was put up for public vote. It proposed lowering the present 700-foot limit downtown to 260 feet and giving bonuses for preservation of registered historic landmarks and provision of housing. It addressed many of the problems mentioned before: air, water, and noise pollution; traffic and parking problems; demands on public services; and creation of a "dark, windy, and uninviting downtown." Like Alvin Duskin's initiation from the early 1970s, it failed to pass.

fig. 60: Coit Tower
Since the late 1950s, there has been increased interest in modifying Washington's 1910 building height law, even though many people feel that doing so would infringe upon the integrity of L'Enfant's plan. Major infringements to date, however, have not come from buildings exceeding the 1910 limits; except for a few exemptions, none of them extreme, architectural development has kept to the letter of the law.

Instead, the threats have come from intrusions into the plan, architectural and otherwise. To understand their nature one must understand the nature of the plan. In brief, it is an axial scheme with wide avenues radiating from and linking significant buildings and monuments; the intrusions have interrupted the views down these avenues.

For example, Pennsylvania Avenue is blocked to the southeast by the Library of Congress; nearly all streets southeast and southwest of the Capitol -- whether axial or otherwise -- are blocked by elevated free-
fig. 61, 62: Washington, D.C. today
ways, or railroad tracks, or end up in military compounds; and the
Robert F. Kennedy Stadium blocks East Capitol Street which was originally
conceived with a direct visual connection to the Capitol. Other intru-
sions have come from roads and highways indiscriminately overlaid upon
parts of the original street network. Much of this occurred in the 1940s
as automobiles -- and the suburbs -- became increasingly popular and as
fears of enemy attack brought decisions to disperse government functions
to areas outside of the city. The redirecting of traffic required to do
this resulted in overstressing, vacationing, and widening of some exist-
ing streets. 43

Though powerful, L'Enfant's plan cannot take such insensitivities
forever. Nonetheless, there has still been a recurring desire for taller
buildings. Being for or against raising the 1910 limits usually depends
on whether one takes a local or national view of the problem. Before
going into detail, it should be pointed out that this raises an important
contradiction: Is it possible for a national capital to be both a success-
ful capital and a successful city, or do the respective needs conflict
too strongly? In Washington, conflict between them appears to be strong.
Though information in this study is insufficient, one conjecture is that
monumental city designs -- like Washington's -- are more apt to raise such
conflicts, especially if the designs are rigidly adhered to.

This point aside, supporters of the local view in Washington have had an overriding concern for the local economy, feeling that relaxing height limitations would help invigorate it. In the early 1970s, Mayor Walter Washington, an advocate for this view, claimed that raising the limits would be "a positive approach to modern times and growing costs." Others agreed, including the City Council, the Zoning Commission, and a number of local architects and planners.9 On the other hand are those who assert that the Capital's significance extends beyond its boundaries. Their view is that increasing the limits would harm the city's symbolic skyline, a loss of some consequence to the country. Among those with this view in the early 1970s were the U.S. Commission of Fine Arts and the National Capital Planning Commission. The Fine Arts Commission has an advisory role over height, color, appearance, and texture of building exteriors in the federal core area.9 The National Capital Planning Commission is responsible for reviewing changes to the city's comprehensive plan.

Though generally opposed to raising the limits, the Planning Commission did authorize, in 1965, a study by architect Chloethial Woodard Smith, a study to see how the city's skyline might be improved. Her proposal was
to place high-rises at selected points within the city. This, she said, would improve the skyline by relieving it of its flatness, by helping frame views of monuments and by providing "gateways" at the city's major entrances. The study, which was widely distributed, met with immediate opposition and proclamations of the city's beauty. It suddenly became very fashionable to refer to the cityscape as serene and harmonious whereas boring and monotonous had been common adjectives before. Among the many opposed to her study was Chicago architect Harry Weese who found it inane to arbitrarily organize skyline features on purely aesthetic ground. He did not comment that this same motivation -- skyline aesthetics -- drove the enactment of the 1910 limits and that it was essentially as arbitrary as Smith's suggestions, maybe even more so. Regardless, the Fine Arts Commission found the proposal similarly offensive, proclaiming: "... we happen to believe in the L'Enfant Plan. It is the finest example of urban planning in the Western Hemisphere and we intend to keep it that way."

Shortly following Smith's study, despite the negative reactions, were a number of bills proposing to raise the Capital's height limit. The bills were substantively the same except with regards to whether 230 feet or 630 feet should be the new limit. The bills' most interest-
ing aspects were the purposes that relaxing the height limitations would satisfy. With a couple of exceptions, they were

To authorize realistic, economic, and modern building heights and bulk in the District of Columbia, to provide new housing and employment opportunities for all, to expand the tax base, to stimulate and assist efforts to break the poverty cycle and strengthen the economy...

These purposes sum up many of the arguments for raising the height limits, but it was not self-evident that doing so would help achieve them. As a topic of public interest, there were at least two sides to the issue. In the late 1960s and early 1970s, the various views found their way into the Washington press and other publications.

Press coverage of Washington's height limits dealt with quality of life, aesthetics, and economics. The first received scant attention whereas the other two were the subjects of considerable concern, this because of the special demands placed on the Capital.

In the press, the problems of light and air and congestion had more to do with comfort than with health and safety as in the earlier cases. Paul Tischler commented that congestion and tall buildings go hand in hand to make automobile travel and parking difficult, and that the loss of light and air makes areas around tall buildings uncomfortable and un-
desirable. Architect Arthur Cotton Moore disagreed that the city would become overly congested if the height limits were relaxed. He pointed out that the Capital, unlike Manhattan, was neither a financial center, a business center, a port, nor on a narrow strip of land.9

The symbolic importance of structures like the Capitol Building and the White House was a pertinent argument for maintaining the Capital's low profile. Numerous references in the press -- too many to mention -- recognized this. This, however, did not keep some authors from criticizing those who adhered to this stance too adamantly. Arthur Cotton Moore asserted that maintaining lower limits to allow monuments to dominate the city was a misguided action: by virtue of the city's topography, the 1910 law already allowed some buildings to stand taller than some of the monuments they were to protect. Jim Seymour agreed and said further that carefully placed skyscrapers would not impact monuments negatively. And Wolf von Eckardt, a champion of civic beauty, admitted that symbolic prerogatives, as important as they are, might have to be tempered given the realities of development. There was another twist to the issue of symbolism: What do skyscrapers dotting the Capital's skyline tell about the ethos of the city and the nation? One of the more surprising comments on this came from Nathaniel Owings of Skidmore
Owings and Merrill. He was opposed to tall buildings in the city, arguing that they represented a "mono-culture ... a mechanistic, scientific-oriented society." Carter Brown, speaking for the Fine Arts Commission, claimed that skyscrapers symbolized economic greed, something quite inappropriate for Washington. 9

Groups arguing to maintain the skyline often did so on the grounds that the city's scale was at stake. For example, the Fine Arts Commission had, for this reason, voted against a bill to increase the height limit. But advocates for taller buildings claimed that the argument did not mesh with reality. James Bailey pointed out that 90 and 110-foot tall buildings were hardly human-scaled -- all they succeeded in was making the Capital "the world's highest low city, a weird distinction comparable to that of being the tallest midget on earth." Jim Seymour, arguing much the same, quoted the New Yorker magazine on the topic of Washington's scale: "It's not even human-scale -- just a succession of thirteen-story dumplings."

Variety was a subtlety of aesthetics mentioned often by those who wanted taller buildings. Generally, they argued that the skyline was monotonous. Arthur Cotton Moore claimed that the city's zoning and height regulation resulted in a "short, fat, sexless" downtown. Alan
Lockman, also an architect, said as much, noting in addition that existing height limits and zoning compelled developers to use every square foot of space available. The result was developments without a trace of open-space amenity. He suggested that height limits be flexible and floor area ratios constant. This would foster architectural variety and urban open spaces without increasing density. And again from Jim Seymour quoting the New Yorker: "The District's commercial buildings all look like ice cubes emptied out of the same tray."

Debates in Washington about economic issues focused on development costs and the flow of capital. Increased costs to developers were crucial to the first; where development occurred and why was crucial to the second.

Development has become increasingly complex over the last century. More people, especially in larger cities, have an interest in (and some control over) development. For instance, city government, neighborhood and citizen's groups, financial institutions, and state and local governments are all likely to have some input. Arthur Cotton Moore remarked that this has added to development costs in ways that may improve a building's design but not necessarily its economic return -- in fact, they usually make it worse. Among the costs he identifies are fees for
architectural presentations to sell the project to the various actors, fees to attorneys to iron out legal roadblocks, and, particularly on larger projects, fees to various consultants for reports and guarantees demanded by government. It was his contention that the 1910 height limitations were out of sync with these new demands and that architects and developers had to be allowed more flexibility in order to develop buildings with reasonable returns. Raising the height limits, he said, would help. 9

Others disagreed. Paul Tischler asserted that tall buildings do not benefit from economies of scale: rather, increased construction costs bring a slight unit area increase as buildings get taller. He added, though, that savings on skyscraper operating costs might make up for this. Jim Seymour attacked the popular assertion that higher property values necessitate taller buildings. He claimed that a would-be developer should run a financial set-up for a piece of property on the market, basing his calculations on the highest and best use, his expected return on investment, and his anticipated site improvement costs. Thus, a fair market value for the property could be determined which could then be presented to the seller. If the seller finds the price too low (in other words, if the seller is speculating on the property) then the developer should just move on. 9 Of course, Seymour's suggestion is
simplistic; in a free-market economy a willing buyer can likely be found at or near the asking price anyway.

A number of writers complained that the city's height limits gave the suburbs an unfair advantage in attracting investment capital, or, conversely, that they scared it away from the city. The Washington Post, in an editorial in March 1969, remarked that employment centers were shifting to the suburbs because of the greater building heights allowed there. John Williams, writing in the Post a couple of years later, said that relaxing the limits would reverse this trend and help rejuvenate the inner city. Some blame for this trend was levelled against the federal government. Paul Thiry noted the government's large demand for office space and then criticized its practice of signing lease and lease-purchase agreements for office space in the suburbs. By doing so, it was perpetuating the trend of suburban growth at the expense of the city's welfare. Wolf von Eckhardt (whose viewpoint on building heights changes often) identified the same problem. He argued that raising the limit was unnecessary and that the federal government should take the lead by moving its offices back to the city. In time, he said, others would follow. He contended that the limits did not need relaxing because of the unrealized potential of the present zoning envelope. He said that if
it was fully realized, downtown employment would go from 1,000 to 13,000 with a commensurate increase in tax assessments.\footnote{9}

Eugene Meyer held that some people criticized those who wanted the 1910 law relaxed on the grounds that the latter, behind a masquerade of downtown development, were really interested in changing the predominantly black downtown into an employment and shopping district for white suburbianites. And, finally, Paul Tischler said that raising the height limits would have a deleterious effect since taller buildings would reduce the amount of land developed on (presumably because there was only so much demand for space). This would mean fewer buildings built and, as a consequence, a diminishing of newly constructed ground-floor retail space.\footnote{9}

The outcome of the ongoing debate in Washington has been the continued application of the 1910 building height law. But as might be suspected, this has not brought an end to the conflicts. A recent phone call to the National Capital Planning Commission revealed that the same issues are being discussed in the same ways they were before: architects claim the skyline needs verticality to relieve it of its monotony, developers claim narrower, taller buildings will bring higher rents, the Planning Commission
and others claim that federal monuments must dominate private buildings, and city officials claim that higher buildings would help the city fiscally.

This situation is unlikely to change in the near future even though Washington was given home rule powers in the late 1970s. The reason is that the structure of decisionmaking still puts all matters pertaining to the comprehensive plan, including building heights, up for federal review. Briefly, the comprehensive plan designates "federal elements" and "local elements" with the respective levels of government responsible for preparation of each. However, all changes to the comprehensive plan proposed by local authorities are reviewed by the Planning Commission and/or Congress to see that they do not conflict with federal needs. The bottom line is that Congress still has the final say in setting and changing Washington's building heights.
At this point, a few concluding remarks are in order. Clearly, each case presented is about much more than tall buildings: when aggregated, they tell us something about generic problems faced in acts of city building.

For one, the skyscraper debates indicate much about the values people hold for cities and the settings they provide. It is apparent that one set of values is about the economic objectives of groups and individuals; objectives often at odds with each other. Equally important are values about aesthetics, health and safety, and the quality of life. Struggles to mold cities so that they support these needs were often at the root of the debates. These values have been persistent, but their relative importance has varied over time. For example, the importance of health issues has subsided as public health and sanitary conditions have improved; and the emergence of quality of life issues
has come about because, first, these issues have become increasingly problematic as skyscrapers have proliferated and, second, for a variety of reasons—e.g., less concern about public health and greater concern for the environment—people now have the "luxury" and ability to deal with such matters. For much the same reasons, it is no longer simply city fathers or those entrusted with protecting the beauty of Washington who concern themselves with aesthetics.

The cases also show that skyscrapers were instrumental in bringing to the fore strains between private gain and public well-being. As such, they elicited some of this country's earliest development controls. Setting and administering these placed additional responsibilities on local government. For example, it was apparently a great challenge to set height standards that were both equitable and legal. The court cases and debates around such standards indicate that it was not always clear that these challenges had been met.

Balancing divergent needs also meant having to be clear on the effects of skyscrapers and development controls. This implied having some understanding of how cities functioned, and, in this respect, skyscraper debates were a barometer of that understanding. The early debates revealed an incomplete comprehension of things like office demand
and supply and the effects development standards have on the flow of investment capital. On the other hand, the recent debates indicated that there is today a better understanding of these and other issues. People now deal in more sophisticated ways with relationships between, for example, employment, municipal finance, and social and behavioral impacts. The upshot is that the skyscraper has forced people to improve their models of urban relationships and, thus, their ability to make predictions.

Finally, a disconcerting observation. If it is true that skyscrapers have presented occasions to be clearer about values, the balance between public and private interests, and our understanding of urban relationships, then why have the debates persisted? Plainly, one reason is that the motivations for developing skyscrapers--e.g., higher rents, prestige, and headquartering activities--still exist. Thus the number of skyscrapers continues to grow. Additionally, their prestige and rent aspects, in particular, necessitate increasingly higher buildings; that is, they perpetuate the trend of increasing heights. The dynamic of these two trends implies, first, that the impacts of skyscrapers are becoming more pronounced, and, second, that there is, as a consequence, an ongoing process of rediscovering skyscraper impacts. Ideally, one
would hope to find an equilibrium point which balanced private economic
gain and public well-being. However, with continued pressures to secure
the former and growing desires to protect the latter, it is unlikely
that this balance can be achieved for any great length of time. Until
it is, skyscraper debates will persist.


22. Hoyt, Homer, One Hundred Years of Land Values in Chicago, The University of Chicago Press, 1933.


