WHY THE SKYSCRAPER?*
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IT MAY seem superfluous in these days to explain what a skyscraper is; nevertheless, its present definition is relatively recent. In the multivolume edition of 1933 the Oxford English Dictionary lists six definitions for "skyscraper." The first, a nautical meaning, is a triangular sky-sail. Then follow several colloquial meanings: a high-standing horse; a bicycle with a very high wheel in the back; an exceptionally tall man; and an exaggerated tale, or "tall story." Finally comes "a high building of many stories, especially one of those characteristic of American cities." Here we get into geography: in 1933 skyscrapers were apparently to be found more extensively in American cities than in cities in other parts of the world. However, the single-volume Oxford Illustrated Dictionary, published in 1962, gives only the last meaning, the many-storied building, and location in American cities is not mentioned, which indicates an evolution not only in the term but in the areal distribution of the structure.

This was a significant change. Indeed, the skyscraper has over the last twenty years come to be an important geographical phenomenon, for several reasons. First, it stands for a specific formula in land use. Second, it reflects a certain type of economic activity, with economic and social connotations rooted in some locations and not in others. Third, it is found mainly in large cities, and especially in American cities. Fourth, it is a distinctive landmark, stamping an original imprint on the urban landscape. We speak of a group of skyscrapers as forming a "skyline," a term commonly accepted to describe certain landscape characteristics of downtown districts in large cities. And finally, it is a phenomenon that is spreading all over the world, to the point where it has become typical not just of American cities but of the architecture of our time. As the skyscraper has spread to other continents, one may even wonder whether it still has the same meaning and function it had in the beginning. These trends may be better understood if we ask, and try to answer, the questions, Why have skyscrapers been built? And when and where?

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HISTORICAL BACKGROUND

Since the most impressive skyline in the world—in extent, density, and height—is definitely in Manhattan, many people think that the birthplace of the skyscraper was on that crowded island, and perhaps for the simple reason of lack of space. But this is not so. The skyscraper was born at the end of the nineteenth century in Chicago, a city much less hemmed in by nature but with a strong tradition in daring architecture. The first such building was the Home Insurance Building, ten stories high, designed by William Le Baron Jenney and completed in 1885. The fact that it was built for an insurance company is noteworthy for our understanding of the entire phenomenon, as we shall shortly see.

The multistoried building of considerable height was made possible by a remarkable contraption, the passenger elevator—an American invention now just about a hundred years old. Lifting devices had been operated for specific purposes for a long time. The use of a pulley to move things vertically, particularly in wells, is ancient, and animal-powered devices to lift heavy weights have been known for centuries around the Mediterranean world. But a passenger elevator, merely to transport people up and down within a building to save them the trouble of walking up and down stairs or ramps—that was something new, and the idea probably came out of the coal mine.

The first passenger elevator officially recorded, and definitely an ancestor of the present ones, was installed in 1857 by the Otis Elevator Company in a not very high building in New York City. It was soon followed by others. Indeed, European visitors to the city in the 1860's were impressed by the elevators in the hotels.

The first elevators were hydraulic, and their rise was limited by the physical laws of the pressure of the water column. An elevator could be lifted by hydraulic force to a height of eighteen or twenty stories, but not much more than that, especially in the nineteenth century. To be liberated from this ceiling, architecture needed the electric elevator, which made its appearance about 1887. From then on, the height to which people could be lifted mechanically was no longer restricted by physical laws, and the sky became the limit.

Still, there were other restrictions, in the weight the structure could carry. Walls of masonry were heavy and if very high would crush the foundation of the building. In the 1870's and 1880's the idea developed of using a cast-iron skeleton frame and covering it with whatever masonry was necessary to mask it. Later the cast iron was either complemented or replaced by steel. The first very high structure of cast iron and steel was completed in
Paris in 1889—the Eiffel Tower. This shaft rises almost one thousand feet above the ground, nearly as high as the Empire State Building constructed in Manhattan half a century later, but the tower had only four stories. It was, said the architectural profession, not a tower but a huge bridge that Eiffel had made to stand up! However, the elements were there. The metal skeleton and the passenger elevator were the two technological innovations that made the skyscraper feasible.

Little by little, especially during the 1890’s, it became feasible to build the steel skeleton stronger and higher; around it only thin curtain walls were needed, to serve merely as an enclosing screen or wrapping. Such walls could be made of the kinds of materials that were at hand if they had the necessary strength and malleability. In short, the principles of construction that led to today’s glass towers were already available in the late nineteenth century.

Chicago, of course, was not the only city to build skyscrapers. New York City soon began to catch up, first with a few rows of high buildings. In 1892 the New York City Building Law made provisions for skeleton construction that gave some assurance of control and strength for the building of high towers. The first of the buildings now standing in Manhattan that was a true skyscraper is the curiously shaped Flatiron Building, completed in 1902. In 1908 the Metropolitan Life Insurance Tower was opened, and in the next few years New York kept producing buildings of increasing size. In 1913 a height of sixty stories was reached with Cass Gilbert’s Woolworth Building, a much more daring structure than any previously built.

In 1916 the City of New York adopted a “Building Zone Resolution,” which established legal control over the height and arrangement of buildings and imposed a progressive setback of exterior walls above a height determined according to the rule of the “sky angle.” That was the beginning of the lean towers rising above a much wider base; the grouping of these towers took on the form that evokes the image of “skyscraping,” or the indented skyline.

Thus several technological and legal factors contributed to the skyscraper’s shape. And to them must be added also a certain taste for building in height.

THE SPREAD OF THE SKYSCRAPER

In foreign encyclopedias and dictionaries one finds different characterizations and definitions of skyscrapers. The strongest anti-skyscraper stand I have found is in the Soviet Encyclopedia, in the edition dated 1954.1

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Fig. 1 (right)—The Palace of Culture in Warsaw, a gift to Poland from the Soviet peoples, completely dominates not only its surrounding park but the city as a whole.

Fig. 2 (below)—Skyscrapers Moscow-style. These two are viewed from the square in front of the Kazan’ Railway Station at left.
Neboskrēb, the word that means "skyscraper" in Russian, is defined as a multistoried, high building, again characteristic of American cities, and its existence is explained by the excessive greed of the capitalists who want to make the most they can out of a piece of real estate. The entry also indicates that as a result of skyline building some American cities, and especially downtown New York, are built up in such a disorderly mass of overpowering structures that community values and architectural quality are destroyed in the city. The skyscraper is condemned both as an architectural style and as a social or economic phenomenon.

But in the last dozen years Moscow has built at least eight skyscrapers—which they call "tall buildings"—that dominate any panoramic view of the Soviet capital (Fig. 2). Photographs of these buildings, especially the Moscow State University and the Hotel Ukraine, reveal that they are reminiscent of the skyscrapers of Chicago or New York in the early part of this century. They recall such structures as the Wrigley Building in Chicago or the Waldorf-Astoria Hotel in New York. Such resemblances show that even the Soviets, despite their virtuous condemnation of skyscrapers, could not withstand the modern urge—a strong one—to build them. Moreover, it was the Soviet authorities who directed the erection in the middle of Warsaw of the Palace of Culture (Fig. 1), which dominates the Polish capital.

In 1962 officials in charge of housing programs in Sweden told me how annoyed they were that small towns, with perhaps ten to twenty thousand inhabitants, each wanted a high tower. They were asking for a skyscraper, whether for apartments or some other use, as a matter of self-respect. Every city now has to have a high-rise building, since without it the city lacks status. Travelers in both South America and Africa know how impressive a skyline many of the cities have (Fig. 3), and these cities are not running out of space!

Some areas, however, have resisted the skyscraper much more stubbornly than others. Among those that have held out against it for some time are not only the Communist countries but places where the greed of the capitalists may be just as great as it is in New York or Chicago and where the same economic factors and trends in real-estate values could be expected to operate. London, for example, until recently had only one skyscraper; now it has half a dozen. In Paris one skyscraper has recently been completed, and a second, which will be a tall tower above a vast lower project over the Montparnasse Railroad Station, is just beginning to rise. Several earlier plans for

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high towers in these congested cities were defeated. In Paris especially, where the Eiffel Tower has become a beloved monument, such opposition to the skyscraper may seem surprising.

THE SKYSCRAPER AND THE CATHEDRAL

The skyscraper as a structural form poses two basic questions. First, is it essentially the result of a technology that is imposed, or is there an economic necessity for it? Second, does it herald some new kind of art or taste that impels architects to build in this form? Recently an article by Aldous Huxley about beauty in modern art was called to my attention, one of the last articles the novelist wrote.3 Huxley begins with architecture and paraphrases Henry Adams about the great achievements of the Middle Ages in construction and in art, comparing them to those of our time and symbolizing the essential difference between the men of the Middle Ages and ourselves: “With their kind of power our ancestors built cathedrals; with ours we

broadcast Westerns, make ice cubes, run computers. ... We are primarily technologists; they were primarily metaphysicians. That is why they built Chartres and we build the New York Hilton."

This is not quite a fair comparison, but as he develops his views in the article Huxley recognizes that man does not live by bread alone and that he does not live by faith alone, either. Faith is not enough to build vast and magnificent cathedrals such as those constructed during the twelfth to the fifteenth century in so many European cities. Technological knowledge was also needed, and confidence in the technological ability of the people to build. For it was not easy at that time to embark on such huge enterprises; relatively, it was much more difficult than to build a modern skyscraper.

Still, there is some kind of symbolism that architecture applies to the materials with which it works, and that symbolism expresses not only a psychological, intellectual state of mind but also a social system. Cathedrals were built because at that time a great church was the symbol of the community in the hands of God. The huge nave was supposedly capable of enclosing the entire population of the city, and even more, for on holidays people came from the countryside around. Essentially, the cathedral was a kind of meetinghouse. And it had to express in many ways all the lore and the emotions of the community, and to be, as such art historians as Émile Mâle* and Henri Focillon have shown, an "encyclopedia," put together piece by piece, of stone and glass. We must think of what the sculptured figures described, of what the stained-glass windows represented, recounting the stories of the Bible, of the Crusades, of the famous heroes of the time, of the best and most beloved things or important notables of the city. As the rays of light streamed into the cathedral through the stained-glass windows, animating their images, coloring the interior, the vast structure would come alive.

By contrast, there is a certain impersonality, something abstract, about the skyscraper. Some may say that this impersonality fits our times, because as a people we are so mathematically or materialistically minded, or perhaps we just like to take one pattern and put it in another perspective. It has been suggested that the skyscraper is merely a three-dimensional variant of the gridiron street plan made to stand up vertically instead of lying horizontally, an interesting view in a century of abstract art. However, the matter is not quite so simple as that. The modern skyscraper was not so impersonal to

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* The basic study of the cathedral as a "book of stones" is by Émile Mâle: L'art religieux au xiiié siècle en France (Paris, 1925).
start with; it once had decorations and embellishments. But admittedly it is
growing more and more impersonal, and perhaps this trend better reflects the
modern social philosophy of the common man. There may also be some-
thing else that pushed all those towers up toward the sky, that fostered the
use of such designs to express modern thrusts—something other than just the
need to house the crowds of workers.

THE CASE OF MANHATTAN

In the December, 1963, issue of Show, the distinguished architect Wolf
Von Eckardt reviewed the major projects of urban renewal in sixteen large
American cities. His interesting article, full of information and wisdom,
begins by commenting on New York City’s “spectacular comeback.” Indeed
it is striking as one remembers how everybody was “selling down the river
the future of New York City” in the years 1945 to 1949. It was commonly
agreed that New York would decline in importance in the future. The city
was not advantageously located for the era of airplane travel, and the time
seemed past when transport by sea made it essential to have the country’s
main economic center a seaport.

It was also agreed that Manhattan Island was far too crowded, that the rest
of New York was too blighted, and that the costs of improving the situation
would be prohibitive. Every major corporation that did not have particularly
local roots—and even some that did—was planning new headquarters else-
where, in Chicago, Denver, Los Angeles, and so on. In a few lines Von
Eckardt sums it up: “I rejoice in the city’s spectacular comeback—a boom of
new apartment buildings, and some one hundred and fifty new office towers
built since the end of World War II, when the Cassandras pronounced
Manhattan doomed to the fate of a congested poorhouse.” In the last dozen
years more than a hundred apartment buildings or hotels have been built on
the island, each with more than twenty stories and therefore in the old sky-
scraper category. But the office-building towers alone would form quite a
skyline anywhere. Practically all of them are located below 60th Street, and
the crowding of the sky in the hub of New York is becoming unpleasant
unless seen in a far perspective.

In January, 1964, plans were announced for the building of a World
Trade Center on the lower West Side of Manhattan, along the Hudson River.

5 Wolf Von Eckardt: Metropolis USA: A Judgment on 16 Cities, Show Magazine, Vol. 3, No. 12,
1963, pp. 78–81 and 142–152.
6 Ibid., p. 79.
Fig. 4—Model of the proposed World Trade Center in New York City, showing the main plaza and the two great towers, each 110 stories high. (Photograph courtesy the Port of New York Authority.)
This will consist of twin towers above an open plaza surrounded by much lower buildings on a sixteen-acre site (Fig. 4). The towers will have 110 stories each and will rise to 1350 feet, higher than the Empire State Building. The entire project will contain about ten million square feet of floor space to rent (that is, besides the corridors, foyers, and so on). Some people feel that with 150 or more postwar office towers Manhattan has already overbuilt, but apparently there is room for more skyscraping. The World Trade Center is being developed by the Port of New York Authority, an agency of New York State and New Jersey, and there is every reason to expect that it will rise as planned. Legislation for its construction was supported by New York City and was passed by the legislatures of both states by 1963.

The Office Industry and the Skyscraper

There must be good reason behind New York’s unquenchable thirst for skyscrapers and the spread of this structural form throughout the world, despite the severe esthetic criticism the existing structures have aroused. The reason may be that the skyscraper is not only a landmark and an art form; it is also the expression of a social and intellectual revolution characteristic of our era. Skyscrapers are, in fact, highly functional buildings. It is noteworthy that the first skyscraper in Chicago and some of the early ones in New York were built by insurance companies—that is, by companies whose business is entirely bureaucratic. Their work is all on paper and in transactions. The expression “office industry” is a debatable one, but so far as it is in use let us stress its significance: to perform its function, an office industry does not need anything but space for executive offices, filing and clerical work, meetings, discussions, and the like. The insurance companies are not the only ones characteristic of the office industry, and not the only ones to locate in skyscrapers, of course.

Some of the high towers are hotels, a use of space rather obviously associated with the kinds of transactions that go on in offices—a large agglomeration of offices would naturally attract a great many visitors to the city for short periods. Some are built for apartment houses or for parking facilities or for both, as is illustrated by Chicago’s Marina City (Fig. 5). But basically the skyscraper expresses the need to accumulate floor space for offices and related activities.

Until recently, there seemed little demand to provide so many offices in the centers of the smaller cities, but now, with the rapidly growing urban populations, this demand appears there also. Thus in 1959 Houston, Texas, had only four tall buildings rising above the general level of the spread-out
Fig. 5—The twin towers of Marina City, Chicago, with combined living, parking, and marina facilities. Behind them, in the middle distance, is the squat bulk of the Merchandise Mart. (Photograph courtesy of Suter, Hedrich-Blessing, Chicago.)
city; today it has many more. One of the four, a rather fat building, was a hotel, another was a Veterans Hospital, and the remaining two were private medical buildings in which offices and other facilities—for consultation, for treatment, for laboratory analysis, for radiology and similar technical specialties—had piled up on top of one another. This raises another point. Medicine today is becoming highly specialized; a really sick person seldom accepts just the judgment of a general practitioner, and he in turn often wants his patient to be examined by specialists, and these specialists may need a corps of technical assistants. Medical practice is much better integrated if the whole complex is housed in a massive building in which one can move from one facility to another simply by crossing a corridor and taking an elevator. Hence large hospitals all around the world are increasingly being built in high-rise fashion.

A modern skyscraper provides concentration for many interconnected activities. Most of them do not have the ten million square feet of floor space that the projected New York World Trade Center will have, but many easily contain a million square feet or more. If such an area were distributed horizontally it would require a great deal of land. It would also greatly increase the distance, and therefore the time, needed to go from one office to another and would be more costly to service adequately. In the skyscraper the same amount of floor space does not require the same cost and traffic time, because of that excellent means of rapid mass transit, the elevator.

Some years ago I had the opportunity of witnessing the change made by a large organization from an enormous one-story office building, with only a small part on a second floor, to a tall, compact tower. That happened in 1951, when the United Nations Secretariat moved from the Sperry plant at Lake Success, Long Island, where it had been since 1946, to the now-familiar great shaft on 42nd Street on the East River (Fig. 6). In the Lake Success building people spent much time walking around the corridors. I recall often taking a visitor through that maze when I worked there in 1946–1947; if you did not want him to get lost you had to see him to the outside gate, where he would emerge saying, “Oh, now we have come out of the underground.” The building was not underground at all, but since it had originally been a large wartime industrial plant, with windows on the periphery only, sunlight entered few of the offices. The structure was air-conditioned and well lighted, but in it one felt as if one were in a cave.

In the new glass tower overlooking the East River, there are some parts in the center of every floor where not much outside light penetrates, but most of the floor space is fairly well in touch with the outside. At least nobody has
Fig. 6—The United Nations building as viewed against the midtown skyline of New York City. The tall structure just to the right of the scalloped Chrysler Building spire is the new Pan American World Airways Building, with a heliport on its roof. (Photograph courtesy Pan American Airways.)
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much doubt about the altitude at which he is situated! However, people on the United Nations staff soon began to protest. They no longer spent much time in transit between offices, but they missed meeting one another and the nice chats they had had in the corridors. In the new building, even if they met someone in the automatic elevator, there was no time to talk. Thus the established system of community communication, the exchange of news and views, had been disrupted as rapid vertical transit replaced the more leisurely horizontal variety. Habits and schedules had to be rearranged, and the transition took years. For the very special system of communication needed inside the Secretariat, and for some particular purposes, it is hard to say which is preferable, the corridor or the coffee break. But in efficiency of work and in time spent in door-to-door inner traffic, the vertical system brought about a tremendous saving.

THE EVOLUTION OF THE LABOR FORCE

The basic question of why we need the skyscraper mode of life brings us to another of the skyscraper's functions. The main reason for its development is not the intensive use of real estate, though the real-estate market has done very well with the high towers, nor is it the efficiency of office organization. The skyscraper is an expression of the social evolution of employment, of the labor force today.

It is a long-accepted truth that the labor force is leaving the farms and going to the cities. Therefore the cities are expanding. But why do they have to expand in height? They used not to; they grew sideways. Urban sprawl is still with us, but it is not necessarily in opposition to building in height. The real point is that employment is no longer going into manufacturing pursuits or the manipulation of goods as it once did. Besides the exodus of people from farms to cities, two other migrations are displacing labor. First, the exodus of the manufacturing plants out of the densely built-up urban centers, and particularly out of the cores of the cities, is an important trend; the warehouses follow the factories, and consequently the storage and processing of goods in bulk are both going out of the cities. Second, these two capital sectors of economic activity are replaced in the heart of the modern metropolis by the influx of white-collar labor of a special kind.

A significant trend, denoting rapid change, has developed in nonagricultural employment in the United States in the last twenty-five years. Employment in nonagricultural establishments—which covers most of the labor

force—totaled 32.4 million jobs in 1940, rose to 45.2 million in 1950, and reached 58.2 million in 1964. Thus from 1950 to 1964 there was an increase of about 13 million jobs, or some 28 percent. This increase was unequal in the various categories of employment. Mining, as is well known, declined rapidly: from about 900,000 workers in 1940 and in 1950 to 635,000 in 1964. Contract construction, on the other hand, has been one of the boom activities in recent times. As a result of all the building, of urban sprawl and skyline rise, employment in contract construction increased from 1.3 million in 1940 to 2.3 million in 1950 and 3.1 million in 1964. In the manufacturing industries employment rose from 11 million in 1940 to 15.2 million in 1950 and 17.3 million in 1964; this means an increase in the last decade and a half of only about two million jobs. Transportation and public utilities increased from 3 million in 1940 to 4 million in 1950 and remained at about the same level from 1950 to 1964. This is important; in the growth of the labor force now taking place in the service industries, transportation and the utilities—the traditional services par excellence—are not instrumental.

It is in the other service industries that the most rapid growth of employment has taken place recently. Wholesale and retail trade employed 6.75 million people in 1940, 9.4 million in 1950, and 12.2 million in 1964. The rapid rise in the 1950-1964 period was due mainly to retail trade. However, this rate of growth was slow as compared with the expansion of employment in the “financial community”; that is, in financial, insurance, and real-estate operations. This sector of the labor force grew from 1.5 million in 1940 to 1.9 million in 1950 and 3 million in 1964, a rise of more than 50 percent. This rate of increase is matched by the so-called “miscellaneous services” (medical services, radio and television, news agencies, the hotel industry, and so on), which employed 3.7 million people in 1940, 5.4 million in 1950, and 8.5 million in 1964. Finally, another fast-growing sector of employment is government, which increased from 4.2 million in 1940 to 6 million in 1950 and 9.5 million in 1964. The increase in the last fifteen years was largely due, not to federal employment, but to employment by state and local governments, which alone accounted for more than three-quarters of the total increase in all government employment.

To understand better what is actually happening, it is necessary to analyze the statistics of employment in manufacturing, which still is by far the largest category of nonagricultural employment, with about 30 percent of the total. Within the manufacturing sector the Bureau of Labor Statistics distinguishes two major categories: production workers and nonproduction
workers. Nonproduction workers are those who work in management, research, financial operations, sales, marketing, economic analysis, and legal departments. They are on the company's payroll but are considered nonproduction workers. From 1950 to 1964 employment in manufacturing establishments increased by only 13 percent, from 15.2 million to 17.3 million, but these 2.1 million additional jobs were not for production workers. The number of production workers in manufacturing has since 1950 remained almost constant, at about 12.5 million (12.8 in 1964), while production itself has been rapidly increasing. From 1950 to 1964 the total manufacturing production of this country increased by at least 60 percent in volume, the population increased by 40 million, and the rise of the per capita consumption rate of the population kept pace.

The same situation has been recognized in agriculture for a long time. To produce more on the farms, and to produce it better and more cheaply, a great many people must come off the farms. In the industrialized countries at least, the fewer farmers left on the land, the more efficiently they usually produce. This trend, for similar reasons of mechanization, automation, and rationalization, is reaching into manufacturing production, and it is affecting the processes of manipulating and transporting manufactured goods. A few years ago in New York there was a joke that if one projected into the future the rise of employment in finance, banking, and insurance in the United States over the past twenty years as a percentage of the total labor force the curve would reach 100 percent about 2056; that is, by the middle of the next century everybody would be employed in banking! The same kind of projection could be done for government employment or for education, where the curve is rising even more steeply—so steeply, in fact, that everyone would be a professor before everyone would be a bank teller.

But the real point here is that those sectors of employment which were, and still are, regarded by the classical economists as external activities because they did not seem to be important elements in the economic process (production through processing and distribution to consumption)—those external activities are now becoming major sectors of employment. They were, of course, peripheral to the economic process of old. It was useful to have people to do the research, take care of management, look after speculation and investment, gather and spread information, but though qualitatively important, quantitatively the group was negligible. Now their number is increasing fast: nonproduction workers employed by manufacturing establishments numbered 2.7 million in 1950 and 4.5 million in 1964, by
which time they constituted more than one-quarter of all manufacturing employment. To understand what this means, think of the skyscrapers in Manhattan, many of which bear the names of manufacturing corporations. The older ones may display the names of insurance companies, but there are also the Chrysler Building, the General Motors Building, the RCA Building, and Lever House. Still newer ones have been built by Seagram, Union Carbide, Sperry Rand, and Corning Glass. Now we see why the total employment in manufacturing establishments in Manhattan may be high, but the figure does not simply represent people who work at producing manufactured goods; it largely represents people who work in the offices, the brain and nerve centers of the corporations.8

A Transactional Civilization

Technological progress is aimed at liberating us from the hard, compelling work of production so that we can indulge in something else—administration, communication, art, research, and also leisure. To run our plants and factories, what we depend on most is not the supervision of the machines or the transfer of the goods, but the effectiveness of communication. How well do the persons in the offices and the professions understand what they say to one another? How well informed are they when they enter into the transactions among themselves that decide the fate of the rest of the economy—in agriculture, manufacturing, transportation, public utilities, and the like? There is an “abstract transaction factor” here, which encompasses not only management but also the entire financial community associated with management. The exchange of information—whether it is scientific or political or economic—is a part of this as well. It is not enough to have data recorded on paper; they must be correctly understood and competently weighed, otherwise their worth and efficiency will be diminished. Proximity and direct communication promote better understanding. In skyscrapers grouped in the city a million white-collar workers can be close to one another. They can meet easily to exchange opinions, transact business, acquire information, and obtain whatever expert interpretation, legal counsel, or technological advice they may need.

8 For an elaboration of this theory, though without specific reference to the architectural consequences, see Jean Gottmann: Megalopolis: The Urbanized Northeastern Seaboard of the United States (New York, 1961), Chapter 11 (pp. 565–630), “The White-Collar Revolution.” It should also be noted that in 1958 the manufacturing industries in Manhattan employed 471,208 persons, with a payroll of $2.17 million, of whom 132,000 were nonproduction workers earning $881,000. Thus 28 percent of the jobs, and 40 percent of the pay, in manufacturing were nonproduction. By 1965 these percentages will have risen greatly.
One of the large buildings of Chicago that can be classified as a skyscraper, though not one of the highest, is the Merchandise Mart. It exemplifies an essential urban function for which the city since ancient times has been the center: a meeting place for the market. The city was also the place for the administration of justice, for the management of politics, and for the observance of rites on religious holidays since the dawn of history. These functions brought the cities into being, and no other helped more in their development than the market function. The Merchandise Mart offers basically the same thing as is achieved in every market. It was Chicago's good idea to gather some of the exhibits of merchandise under one roof, to receive the wholesaler customers, and to give them a choice among a great variety of goods and prices; space is leased to anyone who wishes to offer his goods. The project contributed to Chicago's role as a great trading center. More and more cities are finding it desirable to have adequate buildings for national or international conventions. Material goods are no longer the only important objects of transaction; "marts" are needed for such matters as scientific, political, economic, and technological information. Why all the professional meetings and conferences that take up so much of our time today? Because that is how we give and receive ideas, data, results of work in office, field, and laboratory. In meetings we can test these things, we can choose among them, and we can make as certain as possible of adequate interpretation.

The daily work of decision making requires consultations with many specialists; the specialists cannot be expected to gather where there are only one or two customers, but rather where there are several thousand.9 Also, the specialists prefer to be near one another. This proximity is what the proposed World Trade Center in New York intends to provide in its own field—"a one-stop service and information center for world trade."10 At least several million square feet of floor space is needed for such a purpose. Obviously these requirements mean high structures; in no other way could a comparable area be made available in the immediate vicinity of the large banks, insurance companies, trading houses, corporation-law firms, and other technological specialists. This is what makes the skyscraper and creates the skyline: the need for agglomeration. Now we begin to see in the skyline an expression of the intricate web and huge volume of communication generated by, and indispensable to, the modern transactional way of life.

10 The quotation is from a promotional brochure on the World Trade Center issued by the Port of New York Authority.
Consequences of Skylines

There have been precedents for today's skylines, particularly in the curious narrow towers—in which, however, many workers would not fit—of the medieval cities of central Italy. At the time that Florence was one of the leading centers in the then all-important world of the Mediterranean, hundreds and hundreds of towers pointed up to the sky in Florence, and in Bologna, in Siena, and in the smaller towns of Tuscany. In the small town of San Gimignano, now a famous tourist attraction, thirteen of the fourteenth-century towers are still standing and are well preserved. These miniature skyscrapers were usually put up by the notable local families, the merchants or bankers of that age. They were built partly for prestige, partly because they were the fashion, and partly because they provided a good defense device for the palazzos above which they rose. When there was a time of trouble in Florence, the winning party would commonly require the towers of the losing party to be razed. At least one case is on record when more than three hundred towers were knocked down in Florence alone by political decree.

When the Medici family asserted control over the management of Florence and concentrated all matters of government and most of the city's banking in their hands, only two towers were left standing. One, useful for scanning the horizon around the city, still rises above the then government headquarters, the Palazzo Vecchio; a smaller tower above the police headquarters, the Bargello. The medieval skyline of Italy may be related to the competitive and transactional mode of life of that time, and also to its intellectual and esthetic ideas.

The skyline expresses the need of concentration in a competitive civilization. If the American economy had come to be directed by a small number of persons who made all the essential decisions, the concentration of so many people and so many facilities for transacting business would not, perhaps, have been necessary. A free economy devours more space, more time, and more endeavor on the part of a much larger number of people. But crowding seems a price well worth paying for the freedom, the opportunity, and the many other benefits that derive from a free society.

The compulsion to gather in a central core so much space organized and equipped for white-collar work does not necessarily mean a compulsion toward dense grouping of residences nearby. In fact, the skyscraper contributes to the increasing sprawl, urban and suburban, of housing and of the economic activities, such as retail trade, that follow the customers. It is
impossible for all the many thousands of workers gathered in tall structures within a small area during office hours to live nearby. Moreover, the high price of land and services in the crowded downtown area adds prohibitively to the cost of living. The residences of the labor force must therefore spread out, and as a result the skyscrapers must be provided with rapid mass-transit facilities for passenger traffic, preferably at underground and elevated levels. In most of the European cities where skyscrapers are now rising the towers are on top of or near railroad stations that handle much suburban commuter traffic. In Chicago the Loop is still defined by the elevated rails that encircle it, and more high buildings are rising along or above the Illinois Central rail lines. In New York, the Pan American World Airways building has been built over Grand Central Terminal, and a massive new Madison Square Garden is being constructed over Pennsylvania Station. The World Trade Center was first proposed and planned in 1958–1960 with a different design from that which has now been adopted. It was to rise on Manhattan’s East Side, along the East River. In 1961 that proposal was approved by the New York State Legislature but was rejected by the New Jersey State Legislature. Since both states must agree to such an undertaking, the Port of New York Authority had to re-do the plan, to fit it to a site on the Hudson River. The new design is composed of differently shaped buildings and higher towers. In 1963 the New Jersey State Legislature accepted the revised plan.

One important factor in this decision was that on the Hudson side the new center is going to be on top of the Port Authority tubes that connect lower Manhattan with New Jersey under the river. The people who will work in the World Trade Center towers, many thousands of them, will be able to go down into the basement and take a rapid tube connection to the New Jersey side of the Hudson; this would not be the case were the center to be built on the other side of Manhattan, with better connections to Long Island. There is now a fair chance that Jersey City—which could benefit from some renewal—and other New Jersey areas will profit from the new center. This is a clear example of how the skyscraper affects urban sprawl, pushing it out in a given direction as a result of political decisions and existing transportation facilities.

As the skyscraper increases the sprawl, more is heard about subterranean transport—tubes and subways—and about suburban railroads. Does the commuting pattern ruin both the central city and community life in the region as a whole? Such an effect is doubtful. It is well known that the headquarters of some corporations in the center of New York had planned to move out of Manhattan, perhaps only to the Jersey side of the Hudson, or to the Bronx or Long Island. They explored how their personnel would like this, for they
need good personnel, the more so since their work depends heavily on the effectiveness of communication among their staffs. They need people who not only are competent but also have certain attributes. They found great difficulty in recruiting the same quality of personnel to work in outlying locations. Many still preferred to work in the city, where they had the choice of sophisticated stores, services, theaters, restaurants, and other places of entertainment.

**Skyscrapers and the Art of Living**

The curtain walls of the skyscraper office building are increasingly being drawn open. The steel and cement skeletons are now sheathed largely or partly with glass. The new fifty-story Pan Am Building in New York, for example, is enclosed by 240,000 square feet of tinted glass. Thus one who walks along the avenues in the relatively narrow canyons between glass walls or who works in one of those buildings sees more and more of what goes on inside the hundreds of windows up and down the street.

Let us return briefly to the concept of the medieval Gothic cathedral as an encyclopedia. Its high walls of rather narrow stone pillars let the light stream in from the outside through the wide windows of stained glass, and that stained glass provided a good part of the "book" that the cathedral was supposed to offer—the pictures of famous knights, of great heroes, of Biblical prophets, and so on. Today it is the common man's world that one views behind the tinted glass of the skyscraper's walls; from the streets the life inside the buildings can be followed. The inner life of the city, or at least of its downtown section, is projected toward the outside, toward the rest of the community. In the past it was the person inside a building who looked out to the street and who was the observer. Now it is the person outside the building who can "read," so to speak, an enormous window of "animated stained glass."

This kind of spectacle creates social and esthetic feeling; it is a certain expression of the art of living. Luxury offices or apartments provide interesting tableaus in these buildings, though the pictures may be less artistic for more ordinary occupants. Still another aspect of urban art is beginning to take shape owing to modern skyscrapers: the color of the light within the building can be coordinated or contrasted with the color and texture of the

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12 For interesting views and information concerning the new skyscraper architecture see Ada Louise Huxtable: *Four Walking Tours of Modern Architecture in New York City* (Garden City, N. Y., 1961).
Fig. 7—The spectacular new City Hall in Toronto, which has been described as "an oyster in a shell." (Photograph courtesy Canadian Government Travel Bureau, Ottawa.)
material framing the glass of the walls. This trend is visible along Park Avenue in New York, with the golden light of the Seagram Building framed in dark bronze, or the clear silvery light of the Union Carbide Building framed in glinting stainless steel. All this opens up a new avenue for art; it creates a unique atmosphere in the big-city canyons and stimulates the senses in this huge man-made milieu. The new City Hall of Toronto (Fig. 7), with its “opening oyster” design, symbolizes this modern trend toward an inward-looking but more open society and a freer architecture.

If people of certain occupations prefer to work in this environment it is because the skyscraper system, even when crowded, offers to the urban community a social life which is new, which is being arranged and elaborated, but which has not yet reached its ultimate kind of renovated Gothic expression. For it is a new Gothic in architectural style. It has excitement and beauty. All this, together with the economic functions that congregate here, causes the skyscraper to exhibit something fundamentally geographical that has to do with density of population and with kinds of economic activity that are growing ever more important. It has also to do with a landscape that has always expressed—not determined, but expressed—the social, economic, and intellectual evolution of a society.