THE TOWER
A STUDY IN CHANGE OF MEANING

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To Stanford Anderson,
an enduring inspiration;
and also to my best friend, Don.
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ABSTRACT

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ABSTRACT

The historical transformation of the meaning of the tower is studied in this thesis through a series of descriptive essays that as a whole, reflect, reinforce one another, and in so doing reveal common or related characteristics to tower building across time.

Each essay represents a contextual framework; the meaning of the tower, suspended in the framework, is revealed through the characteristics of appearance, function, and purpose, their interrelationship, and their relationship with the given set of historical and environmental conditions. When a tower acquires a powerful context-independent meaning it has achieved the status of a myth or an idealized image.

The analysis of the essays isolates themes, or continuities of the characteristics of meaning across historical and environmental frameworks, and defines them with examples and comparisons from the essays.

When the skyscraper is evaluated with reference to the themes, its meaning in relationship to towers of the past and to the framework of the present day is elucidated.

Thesis Supervisor: Stanford Anderson
Title: Professor of Architecture
I wish to build a building twice as high as the Eiffel Tower, placed in the middle of the heartland of America, as our new Capitol.

Philip Johnson

"25 Cultural Wishes for the New Year"
New York Times
December 28, 1980
INTRODUCTION

It is not hard to realize that we perceive the contemporary skyscraper very differently from towers of the past. But it is much more difficult to understand why. The intent of this study is to show how the meaning of the tower has changed, from the earliest towers constructed to the skyscraper of the present day. Prior to the initiation of an investigation on the nature of the tower and its historical transformations, the scope of the pursuit should be delimited by definition of the phenomenon examined. Gwilt's Encyclopedia of Architecture of 1851 provides a pre-skyscraper definition of tower:

A lofty building of several stories, round or polygonal.

Sturgis' Dictionary of Architecture and Building of 1902 offers a post-skyscraper definition:

A structure, of any form in plan, which is high in proportion to its lateral dimensions; or which is an isolated building with vertical sides and simple character, even if not high in proportion or a part of a structure higher than the rest, but always having vertical sides for a part of its separate and detached altitude; or, in buildings erected for defence, a projecting part, nearly equivalent to a bastion, often, but not always, higher than the curtain.... Also, in fact though not in name, the high many-storied office buildings or skyscrapers of the United States, when assuming the form of a shaft of uniform width and depth, high in proportion to horizontal dimensions, and rising above surrounding structures.
The most obvious source is Webster:

1. A building or structure designed primarily for elevation that is higher than its diameter and high relative to its surroundings, that may stand apart (as a round tower, campanile, or pagoda), be attached (as a church belfry) to a larger structure, or project above or out from a wall, and that may be of skeleton framework (as an observation or transmission tower); 2. A structure or mass in the form of or resembling a tower... 3

Sturgis considers the skyscraper a tower, even though it is not called one, but Webster assumes that the skyscraper is not a tower, only a structure that happens to look like one. Such confusion over the definition of the tower implies that it is not understood fully why the skyscraper is perhaps not truly a tower, nor why it has assumed such a dramatically modified role in the twentieth-century cityscape. To understand why a transformation has occurred in the way we perceive the tower, one must understand how the meaning of the tower has changed, not only currently, but since the time the earliest tower was constructed. Examination of the meaning of a tower to a particular place and time, or context, can be initiated by knowing what it looked like: whether it was tall, what shape it was, whether it appeared to be open or closed, how it was constructed, whether it was attached or unattached to a larger structure, what its internal structure and system of vertical circulation was, and what was the nature of its stylistic detail. We also must know something about its function, its utilitarian value, or day-to-day use: whether it was used as a watchtower, for fortification, as a bell tower, or a lighthouse, a place for working or living, or whether it had any function at all. More importantly we must understand its purpose: why was it actually built?
Perhaps to scale the heavens, or to view the earth, to compete, to legitimize authority, as a civic landmark, or for purely practical reasons. An investigation such as this one provides us with a detailed description of the tower, certainly an extension of the dictionary definition, but does not provide us with a complete understanding of the meaning of the tower to a given place or time. Meaning can only be truly understood as part of a larger contextual framework, historical and environmental, a framework with which continual interaction occurs, where an ascribed meaning is reinforced, shaped and gradually modified. Specific purposes for building, utilitarian demands, or aesthetic considerations, have at times remained continuous across particular contextual frameworks, have disappeared as frameworks have transformed, have recurred in later frameworks, or have been initiated as part of a new framework. As individual aspects of meaning they are continually shifting, meaning is continually transformed. In retrospect they appear as themes and through their comparative nature provide an insight into transformations of both meaning and context. The following essays represent a series of studies of context and meaning of specific towers at a static location and time. The analysis isolates themes that have appeared across particular contextual frameworks and examines their internal transformations. It is believed that such an investigation will provide new insight into the towers and frameworks under consideration, including towers in the framework of the present. Overall, the question that demands an answer is: how has the meaning of the tower changed, and what implications, if any, does this have for the twentieth century skyscraper?
BABEL

And they said one to another, Go to, let us make brick, and burn them thoroughly. And they had brick for stone, and slime had they for mortar. And they said, Go to, let us build us a city and a tower, whose top may reach unto heaven; and let us make us a name, lest we be scattered abroad upon the face of the whole earth.

Genesis 11: 3-4

Early nomadic peoples were facilitated in their labors by favorable conditions of climate and soil and settlement was generated in propitious geographical regions such as the alluvion of the Nile, the fertile lands of the Tigris or those of the rivers of China. Rural villages, as a result of intensified anxiety and aggression, soon transformed into burgeoning walled urban communities. Hammurabi laid the foundations of Babylonian power nineteen centuries before Christ, when the legendary eighty-two articles of his code were dictated to him by the sun-god Shamash. He emphasized the King of Gods, Marduk, as demonstrated in the construction of the Marduk temple Ensanglia and the terraced tower Etemenanki. Etemenanki, later rebuilt in about 625 B.C. under Nebuchadnezzar, who succeeded in making the second Babylon even greater than the first, was to become known as the Tower of Babel.

According to Nebuchadnezzar, "the lord Marduk commanded me concerning Etemenanki, the stated tower of Babylon, which before my time had become dilapidated and ruinous, that I should make its foundations secure
in the bosom of the nether world, and make its summit like the heavens."\(^1\) As a result of this Tower, Babylon in the Old Testament account disproportionately dwarfed all other cities in pride.

Reconstructions of the walled city of Babylon show it bordered by the Euphrates and two large canals. Located near the Hanging Gardens, the Tower was approached through the Ishtar gate, one of the eight broad gates dedicated to the guardian divinities, along a paved lion-flanked processional way. The ziggurat form, upon which the Tower was based was often more wide than high, more a hill than a tower. But Nebuchadnezzar's structure, though retaining the steps, made them wide and steep while greatly increasing the dimensions of each tiered level: from the 109-foot-high base of the Tower rose a 59-foot-high second terrace, surmounted by four terraces, each approximately 20 feet high, and topped by a 48-foot temple that created the highest step, accessible only to priests. The ancient traveler Herodotus of Halicarnassus described the approximately 300-foot high tower in an account of his journey to Babylon in about 460 B.C.:

... a solid tower was constructed, one stadium in length and one stadium width. Upon this tower stood another... All eight towers can be climbed by means of a spiral staircase which runs round the outside. About half way up there are seats where those who make the ascent can sit and rest. In the topmost tower there is a great temple, and in the temple is a great bed richly appointed, and beside it a golden table. No idol stands there. No one spends the night there save a woman of that country, designated by the god himself, so I was told by the Chaldeans, who are the priests of that divinity.\(^2\)
Without actually breaking tradition, the first great tower had grown out of a previously terraced ziggurat structure. The Babylonians did not see the earth as a ball or disk, but as a pyramid of seven terraces, in acknowledgement of the seven "planets" (five planets were known at this time, in addition to the sun and the moon), with the dome of three heavens above and the ocean flowing around. In this image Babylon, actually Bēb-īlānī, or gate of the gods, was situated on the uppermost terrace. The stepped pyramid dominated the city of Babylon as a replica of the Babylonian conception of the world. Etemenanki appropriately stood for "House of the Foundation of Heaven and Earth."
The ziggurat structure was considered by the Babylonians to be a link between heaven and earth, the cosmic mountain made from primeval chaos and symbolizing the original unity of earth and heaven. By ascending the seven stages or the seven planetary spheres, the priests attained the summit of the Universe. But according to Mircea Eliade, this symbolism of climbing and of stairs actually belongs to the archaic content of the human psyche and is not a "historical" creation, not an innovation dating from a certain historical moment. The act of climbing or ascending symbolized the way towards an absolute reality, representing the end of the profane human condition, embodying associations of sanctification, death, or deliverance. The stair performed the function of the bridge or ladder between heaven and earth as seen in a dream by Jacob: "And behold! The angels of God were ascending and descending on it." 3

The Biblical story of the Tower of Babel appears repeatedly in medieval and Renaissance literature and art where it is treated as a historical incident with strong moralistic overtones. Of particular interest is the devotion to it by Athanasius Kircher, the most prominent of latter-day Christian Hermetists, whose fundamental Christian beliefs were based on an astrologically ordered cosmology. The most famous Jesuit of the seventeenth century and a man of vast and heterogeneous learning, he was devoted to providing a scientific underpinning to the crumbling structure of Hermatism: with him the Hermetic tradition of the Renaissance effectively ended. Part mystic and part scientist, he ventured into mystical architecture with Arca Noe, published in 1675 and its complement
4. Athanasius Kircher, displacement of the earth's center of gravity by the Tower of Babel

Turris Babel, published in 1679. The Biblical account of the Tower of Babel, condensed in a few verses, provided little content, so the latter reconstruction was more arduous than the first. The basis of the mystical importance of the Tower for Kircher was that he believed it was grounded on the capital sin of pride and therefore a symbol of those who chose to remain outside the fold of the Catholic Church. The erection of the Tower by Nimrod, which Kircher assumed proceeded for a half a century, was based on ambition and pride and consequently could only end in confusion, as the Biblical account stated. Speculation of the height reached by the Tower had of course been attempted previously: St. Jerome had claimed it was 4,000 feet high and Philo argued that
its summit was 5,000 feet or 1,000 feet higher than the loftiest mountains on earth. Avoiding simple numerical estimates, Kircher set out to disprove that it was the celestial world the Bible was referring to when it stated Nimrod desired to reach heaven. He demonstrated through diagrams that to gain this height would have meant building a tower five times the earth's sphere, therefore displacing the center of gravity. He continued his interpretation with the claim that Nimrod, despite his pride, was probably the greatest architect that ever lived. This was demonstrated in his comprehensive understanding of the theories of architecture, matched only by his immense knowledge of its practical aspects. His organizational skills were displayed in the vast preparations he undertook for such an extraordinary endeavor: the numerous meetings with subordinates, coordination of multitudinous dimensions and careful selection of appropriate materials. His astounding technical capabilities were demonstrated by the procurement and operation of hoists, cranes, and other mechanical contrivances that certainly were marvels of engineering. Although he must have possessed exceptional intelligence and strength of character, he also lusted for power, was impious, cruel, and of unbounded rapacity. Worst of all, he spread idolatry among his subjects, causing them to build toward the sun. Kircher continued his analysis with a physical description of the Tower: it was circular in plan, helical in elevation, and shaped much like a cochlea. This type of structure lent itself well to the transportation of materials skywards. Kircher's depiction of the Tower through engravings was an influence on the later paintings of Pieter Brueghel.
André Parrot, who has currently studied the meaning of the Tower, states that the general approach to the interpretation of the story in Genesis II has been to seek a moral rather than historical truth. Adopting a theological bias, a severe judgement is often made on the motivations for undertaking such an enterprise: by building their city and their Tower with a success that is due to their being united as one people speaking one language, the Babylonians aroused the jealousy and wrath of God; their achievement, which others may have copied, was an intolerable threat that God suppressed without hesitation, creating confusion and scattering them. Later commentators have gone out of their way to justify this severe condemnation, denouncing the subtle paganism present in even the most religious being that wished to ascend to heaven by any means available and force the deity to come down. But Parrot believes that the Babylonians had no such intention. If they were to be blamed for approaching heaven to be near their gods, then we must also condemn in the same way all of mankind's initiations such as the towers of Notre Dame and the spires of Chartres Cathedral. He states that the Tower of Babel is the Cathedral of Antiquity or perhaps more blameless, for at the time the Cathedrals were built mankind had experienced a divine revelation. In the third millennium before Christ the human race was only feeling its way, their hands clasped in prayer and their eyes raised towards the heavens; although worshipping false gods, the essential step to look beyond this world had been taken. Referring to the purpose of the ziggurat, Parrot finds reinforcement for his premise: the Tower of Babel was a
stairway to heaven and the temple it supported was, after all, a gate. 5

Alexander the Great found the Tower a heap of rubble in 331 B.C. when he entered the old metropolis of Babylon in the course of a bloody, triumphant expedition through Asia. The glamor of the city did not vanish completely and its name was so highly regarded that upon return seven years later, albeit with a greatly reduced army, he decided to establish his residence there, a new location from which to exert his imperial influence. He ruled a half year longer. In this short time, he hurried reconstruction of the Tower, which he had previously ordered be started on his first arrival. Twenty thousand soldiers and workmen, essentially slaves, had to carry away the ruins of Etemenanki and clear the building site, but construction was never started. Alexander the Great died on June 13, 332 B.C.: for Babylon this meant the loss of its last chance to become capital of the world as perceived in its time. Its prominence began to wane, its population declined, its palaces crumbled. From this point on little was known of the previously flourishing desert metropolis.

The Babylonians had exploited the early construction technique of mud brick and bitumen in their magnification of the conventional ziggurat form to an inflated scale, creating a structure higher than any built previously, metaphorically impelling the mountain summit, the gate of the gods, the city of Babylon towards the cosmos. Though in accordance with tradition it functioned typically as a step-
ladder for priests, the Tower of Babel was also an expression of a religious society that believed it was the locus of the world; it was a civic status symbol. Various interpretations put forward in the past and current scholarly speculation do not diminish, but only fuel the significance of the Tower; on a mythical level it will always represent the quintessential Tower of over ambition, arrogance and pride, the moral lesson for the hubris of mankind.
ALEXANDRIA: THE PHAROS

Founded by Alexander the Great in 332-331 B.C. and planned by Dinocrates, one of his generals, Alexandria became the first city to bear the name of its founder rather than of a god or mythological hero. On a narrow neck of land between Lake Mareotis and the Mediterranean, opposite the Island of Pharos, the Greeks had created their last and probably their greatest city-state: the waning Egyptian capital of Memphis and scattered minor villages became a backdrop for this wealthy metropolis, the cross-roads of three continents, and major commercial center specializing in the trade of papyrus, glass, perfume, ivory and silver. On the basis of such commercial wealth under the dynasty of the knowledge-acquisitive Ptolemies who assumed power after the death of Alexander, Alexandria soon became regarded as the world center of the sciences. Scientists had the first zoological garden in history at their disposal. Euclid, the father of geometry did his teaching and research work at the Museum in Alexandria and Archimedes of Syracuse frequented it on a regular basis. Eratosthenes measured the size of the earth and came within fifty miles of its true diameter, Hipparchus made the first attempt to catalogue and map the stars and their movement across the heavens, and Hero devised the first steam-engine. The historian Strabo who visited Egypt about 25 B.C. reported what he saw: the 100-foot-wide porticoed Canopic Street

5. Hermann Thiersch, Reconstruction of the Pharos at Alexandria, elevation
Early Reconstructions of the Pharos at Alexandria

where the main agora and civic center were located, two harbors, palaces, the Museum, two libraries, the theater, the sacred temples Caesarion and Timonium, and the prominent Pharos, or Lighthouses of Alexandria.

On the Island of Pharos, joined to the city of Alexandria by a dike about 900 feet long, the great Pharos was built between 283 and 247 B.C. by Sostratus of Chidus. Planned by Ptolemy I Soter and inaugurated by Ptolemy II Philadelphos, it was dedicated to the Savior Gods on behalf of the navigators. It initially functioned as a daytime landmark until the first century B.C. when it was converted to a lighthouse. According to a survey made by Ibn al Shalikh of Malaga who lived in Alexandria in 1165-66, the
tower stood on a vast massive masonry platform about 350 feet square and 25 feet high that acted as a barrier against the sea. From the center of the platform rose the first section of the tower, measuring about 100 feet square and 230 feet high, containing a wide internal stair and fifty chambers housing offices and military barracks. From a platform at the top, the next stage rose 115 feet in the form of an octagon 55 feet across the that housed two stairways; above this was a cylindrical section containing the lantern about 30 feet in diameter and 85 feet high. At the time of this survey, the original top that had supported a statue of Poseidon had been replaced by a small mosque from which apparently a light signal was still displayed. In its original form it was probably about 450 feet high, only 20 feet lower than the pyramid of Cheops.\(^2\)

Reconstructions by Hermann Thiersch show it externally to be a heavy, closed structure, regularly punched with small deep voids at the office levels, its massiveness articulated with columns and piers and softened at the edges with ornamental
vestiges of Greek culture denoting a veneration of the sea. The importance of the immensity of this structure cannot be overestimated: constructed of fired brick and faced with marble, it was the tallest roofed tower ever built until eclipsed by the steel-framed skyscraper of the early 20th century.

Although Alexandria is the first lighthouse for which a written record exists, it does not mean that there were no earlier ones, as it is unlikely that a building so magnificent and so successful would have been a prototype. Another lighthouse, Aegea, in Eastern Cilicia, was represented on a Syrian coin in 197-64 B.C. At about this time lighthouses must have become a familiar sight in coastal cities as indicated in a description given of the Pharos at Alexandria by Pliny in A.D. 77, translated in the sixteenth century:

"the use of this watch tower is to shew light as a lanthorne and give direction in the night season to ships for to enter the haven and where they shall avoid barrs and shelves; like to which there be many beacons burning to the same purpose, and namely at Puteoli and Ravenna."

Representations of these fire beacons have been discovered on medals and coins, bas-reliefs, lamps, vases and other period objects: The lighthouse had become a symbol of seaports. A Roman bas-relief, now in the Vatican museum, shows a number of figures personifying marine cities and recognized as such by the association of each with a lighthouse.

After Rome acquired greater power as the capital of the Empire, Alexandria was still able to exert a
tremendous influence on the formation of major policies. It retained its commercial and intellectual status and became known as the greatest trade center in the world. At Alexandria, Vespasian had himself proclaimed emperor in 69 A.D., and following him a long train of emperors continued to frequent the city. It began its decline when Caracalla, who ruled from 211-217 A.D., having been mocked by the citizens, proceeded to massacre a number of its youth. It continued to suffer a slow decline similar to that of Babylon: today its site is a mass of ruins.

The Pharos lasted for over a thousand years until destroyed by an earthquake in 1375. On a practical level it had functioned originally as a signpost and later as a lighthouse; one can also assume that the offices and barracks were utilized on more than an occasional basis. But the immensity and grandeur that led to its designation by the people of antiquity as one of the seven wonders of the world was not required to fulfill everyday uses such as these. Like other lighthouses of the time it was a symbol of a seaport, but surpassing the Tower of Babel, it additionally became the tallest tower ever constructed. Perhaps for its learned creators the erection of the lighthouse was the exercise of a technical possibility, another scientific experiment. Nevertheless, it can only be inferred that the Alexandrians had enhanced the expression of civic pride that had its beginnings in Babylonia: the Pharos was intended to be a landmark that celebrated and propagated the magnificence of Alexandria as the commercial and intellectual pivot of contemporary world culture.
ROUND TOWERS

The Romans exerted their constructional daring with the erection of amphitheaters, triumphal arches, and temples to their gods. Their version of the tower, the stubby turres, appeared as an articulation in palace and fortification design, but as builders they refused to aspire skywards. However, with the development of Christianity there were unprecedented social requirements for architecture; within this new context the tower would make a highly significant original contribution to Early Christian design. By the sixth century towers became established as important ancillary elements in church architecture. Their demand as functional components of an ecclesiastical establishment can be traced to two contemporaneous early developments. First, bells were introduced into church services in the fifth century and within the following century became popular with ecclesiastics and the public, leading to the inevitable development of a belfry integrated in the body of the church.¹ Second, when persistent and repeated attacks of the barbarians necessitated the construction of fortifications, the early towers that had initially been built adjacent to Syrian churches for purposes of defense were renewed in continental Europe near ecclesiastical establishments, the most substantial and capacious refuges.² The initiation and increasingly widespread use of the tower marked an acknowledgement of verticality in church building.
which became characteristic of Early Christian architecture and appeared at its culmination in Gothic architecture where every soaring line of structure followed the vertical impulse.

Prior to the fifth century there were probably Christians in Ireland, but St. Patrick can be attributed with the spread of Christianity and the resulting establishment of contact with Gaul and, in all probability, Rome. But from the middle of the fifth century until nearly 150 years thereafter, due to the advance of the English into Britain from the east and south and barbarous invaders from Gaul, Ireland became isolated from the influences of central and southern Europe. Outside the Roman sphere of conquests, it did not have to confront the inclination to adopt the Roman methods of building; consequently its architecture, like its culture, continued indigenous forms. Later renewed communication with England and continental Europe, primarily through the travels of monks, did not prompt the Irish to give up their native style of construction. The vast majority of the buildings of Ireland, including churches, were made of wood although some were constructed of stone without mortar. For reasons of protection from the weather and foreign invasions, and as a result of the increased contact with continental Europe, an evolved method of stone and mortar church building developed. The first mention of an authentic stone church was made in 789. Shortly thereafter, the earliest Round Towers were constructed.
It has been suggested that the tower type reached Ireland through Brittany. Both were simultaneously subject to Norse invasions so it is not surprising that both should adopt a similar method of protection and defense. Towers resembling the Irish Round Towers no longer exist on mainland Europe probably because they have been almost wholly destroyed or replaced by later towers. Viollet-le-Duc attributes the origins of the detached cylindrical towers to the Eastern cylindrical pillar, perhaps the result of an influx of Byzantine workmen into Northern Italy to the Court of Charlemagne in the late eighth century. Remaining examples of these influences in Europe are typified by the towers of S. Appolinaire in Classe and S. Apollinaire Nuovo in Ravenna which were constructed within a century after the first Round Towers appeared and were to become precedents for later elaborations such as the campanile at Pisa, where the tower type was merged with the local decorative marble arcade. Only the oldest and simplest
examples of this tower type exist in Ireland, as indicated in the fundamental quality of the cylindrical stone form and the primitive conical stone roof. 3

Considered the most poetic of all Celtic architectural creations, the graceful, tall and delicately tapering Round Towers embody the coarseness and bravura of Northern design. Varying in height from 50 to 125 feet and in diameter at ground level from 14 to 16 feet, they rise from a base consisting of a double or triple plinth. The wall is thickest, approximately four feet, at the base of the tower and it diminishes in thickness as the tower, with height, diminishes in breadth. Including the floor level at the doorway elevated high above the ground, they contained four and often more stories as indicated by offsets, corbels and stair holes for joists. The floors and the spiral stair connection between them were constructed of wood. In almost all cases, one window occurs at each floor level, except at the highest level where there are generally four windows, often oriented in the direction of the cardinal points. The tops of the doorways are flat or semicircular; the windows have flat, round or triangular heads, however what is semicircular outside is sometimes square inside and a head triangular externally may be internally semicircular or square. Jambs at openings are inclined, but not splayed. The tower was intended to end with a conical stone roof, but in later periods battlements were substituted or in many cases roofless towers were left to deteriorate at the top. With few exceptions, they stand isolated from accompanying ecclesiastical structures.
As other venerable monuments, the Round Towers were an inspirational source for the exuberant antiquarian imagination. Some claimed they were embedded deeply in antiquity and therefore pagan. Some speculated that they were perhaps tombs, fire temples of Persian origin, Buddhist temples, temples of Vesta, astronomical observatories, or minarets from which to proclaim Druidical festivals. Others believed they might have been first built by the Danes, or were intended to be anchorite pillars, or penitential prisons. Substantiation for this type of myth-making was often based on unfounded assumptions, mis-translation of false etymology, misquotation of existing works and quotation of imaginary works.

A more scholarly approach to the interpretation of the fundamental purpose of these towers was taken by Arthur Champneys in *Irish Ecclesiastical Architecture*. First, he claims, the towers were ecclesiastical. They were invariably associated with a church or group of churches to the west or northwest of the church entrance door which faced the door of the tower. Second, they were used for defense purposes, or as refuges into which the monks or clergy might flee taking with them their books, relics and church plate. A conclusion such as this one may be suggested by the mutual orientation of the church and the tower doors, but it is substantiated by the fact that the tower door, or double doors, secured by iron fastenings, was raised 6-10 feet above the ground, accessible only by ladder. Additionally, openings were provided at floor level for dropping stones or shooting arrows at besiegers and an opening was provided above or beside this tower door, probably for a similar purpose:
persons trying to force the church door would become victims of the arrows shot from this window or the doorway. The greatest weakness of the tower when needed for defense was the susceptibility of the exposed wood on the interior to fire, although fire-gutted towering masonry shells often continued to function as places of refuge. A third purpose of the tower was its function as a cloicthech or bell-house. The topmost level with its many openings was ideally suited to this use. Fourth, according to Viollet-le-Duc, they were used as watchtowers, a reasonable supposition, because from their heights it was possible to command a wide, distant view overtopping the low rises of the earth. Also, the upper windows occasionally corresponded to the approach roads of the monasteries. Fifth, the tower was intrinsically a landmark designating a church or monastery. According to Viollet-le-Duc, it was likely that a light would be placed in the top windows at night, as was the custom in smaller towers in French cemeteries. Finally, although it may not have been a deliberate intention, the Round Towers provided unity to the ecclesiastical establishment over which they presided. Standing isolated they were nevertheless an integral piece in the grouping of churches and other small related structures, usually surrounded by an enclosure.

When it was discovered by the Irish that a belfry, watchtower and keep were necessary and when war and pillage demanded a symbol of pride and power in Irish Christian architecture, a lofty stronghold was raised adjacent to the cottage church, often lifting the cross high on the conical roof, a beacon for
Christians, a warning to invaders. Eastern influences had made their way across the continent to the remote northern island where with the development of stone and mortar construction the Round Tower had its primitive beginnings. It was probably this primitive quality when contrasted with contemporary architectural conventions that fueled later mythological and mystical associations, some of which remain today, despite the attempts of historians to unravel the complex layering of attributions the towers have unceasingly accrued with time. Less a declaration of ambition and pride and more an elegant assertion of practical needs, the towers reigned delicately over the low undulations of the Irish landscape, as quiet but assertive reminders of the significance, solemnity and growing presence of the early Christian Church.
Prior to 800, the majority of early church buildings were built east of Italy and on the shores of the Mediterranean: Western European building at this time was generally a provincial adaptation of Roman architecture. Construction slowed as barbarians invaded the crumbling Roman Empire, at the time in the process of transforming into the Western European system of nation states. In the seventh century a new church architecture began to emerge that depended no longer on Roman Imperial practice, but on ancient themes reinterpretated by new economic conditions and the social practices of new populations.

Church buildings in Western Europe prior to the reign of Charlemagne were small compared to Roman basilicas or Byzantine churches of the same period. Even in Rome building had practically come to a standstill and the popes of this time, better known for their elaborations and formalizations of the liturgy, chose to restore existing buildings opposed to creating new ones.

With Charlemagne, a new period of building activity was initiated. Pepin the Short, who had defended Christendom from Germanic tribes to the East and the Moors across the Pyrenees, displaced the reigning but decaying Merovingian dynasty with new territorial claims, consequently gaining recognition from the
papacy through the elevation of his son Charlemagne as Emperor in the year 800. With this coronation, a new status of Holy Roman Emperor, Emperor of the West, was accepted and recognized by the Byzantine Emperor, and an axis was set up between the papacy in Rome, the seat of Christian spiritual leadership, and its new secular protector. This axis was to dominate European affairs prior to the Reformation when it waned in force until the abdication of the last emperor in 1804. Determined to express his combined orientation towards ecclesiastical and cultural matters in the establishment of a new built environment, Charlemagne turned to Constantine the Great, the Roman Emperor who was later considered the archetype of the Christian ruler, and became determined to make his court a cultural center that rivalled the Byzantine Emperor's court. Byzantine planning, exemplified in San Vitale in Ravenna, a Byzantine outpost and former imperial capital, was echoed in Charlemagne's most ambitious of church buildings: the octagonal Imperial Palatine Chapel at Aix-la-Chapelle. Although it additionally expresses the influences of a number of octagonal buildings in lands surrounding the Mediterranean, Aix-la-Chapelle was a building of its own time. It was smaller than San Vitale, and differed in character from Hagia Sophia, another suggested influence, and lacking the spatial complication of the former, instead it possessed similar qualities of smallness and solidity found in contemporary ecclesiastical buildings. The major surviving monument of Carolingian architecture, Aix-la-Chapelle has been suggested as the basis for the contrivance of the westwork, or as the "key" to the westwork question. 2
Architecturally, the westwork is considered a type of tower construction; in medieval writings it was referred to as a *turrīs*. The tower, from Carolingian times onward was one of the most impressive elements of medieval architecture. In ecclesiastical building it was found alone, in groups, or more characteristically incorporated into the structure of the church. As a constructional form the westwork was new and unique, a creation in its own right as opposed to an imitation of antiquity. From readily available precedents, the Carolingians adapted their own versions of such elements as columns and vaults and of spatial organization such as the basilica, investing these forms with a new meaning expressive of their cultural values. Judged today as one of the most significant phenomena in earlier architecture, scholarly controversy surrounds the significance and function of the westwork structure as a whole. In a description of St. Riquier it was claimed that monks and novices received communion at Easter and Christmas during
mass in the "upper west" portion of the church although the function of the vaulted ground floor was not clear. Perhaps westworks had various liturgical functions and significance related in some way to their dedication, an attribution governed by the relics they contained. The association of the altar with a relic was a fundamental problem in Early Christian church design; it was considered an ecclesiastical rule that every altar should contain a relic shrine of one or more martyrs. The conflation of the martyrium and the eucharistic church created the new planning problem of providing access to the relic to a large number of worshippers in such a way as to avoid interference with the celebration at the high altar. With the multiplication of relics and martyria, altars were no longer confined to the eastern end of the nave nor even the eastern extensions of the church. Altars were also added to the western end, the major martyia acquiring the character of independent "churches". Other speculation centers on the role of the emperor. It has been postulated that the westwork was the seat of the emperor in the course of his travels, or was understood as a church reserved for the emperor. These two premises may be viewed in a joint relationship to one another since it is possible that the emperor and his entourage could have made use of the westwork from time to time for their own purposes, though the function may have been primarily liturgical. Additional suggestions regarding the function of the westwork include a parish church, baptistry, seat of judgement, symbolic or operational fortress, mausoleum, and a royal chapel or in the case of later
westworks a loggia in imitation of the Palatine Chapel at Aix-la-Chapelle.  

The Chapel was part of an ensemble that also contained the Palace and an Audience Hall; the entire group was reminiscent of the Lateran Palace in Rome. In addition to the Byzantine characteristics expressed in the Chapel, such detailed considerations as the designation of the Audience Hall as the "Lateran" and the erection of a statue of Theordoric the Great, alluding to similar monuments found in Constantinople and Rome, reinforced the importance to Charlemagne of the model of Constantine as the archetypical Christian ruler. Located on the southern end of the ensemble, the Chapel was the climax of a vast composition that measured about 300 feet on the principal and transverse axes. At the western extremity of the main axis there was an entrance into the Audience Hall. It contained galleries on two levels and was dominated by the monumental westwork facade of the chapel. Here the emperor would make appearances in a tribune to a potential crowd of 7000 people. The cylindrical turrets of the westwork housed spiral staircases that rose up to a throne room at the tribune level and continued higher to a small reliquary chapel where Charlemagne housed an extraordinary collection of relics. Between the west towers on the exterior there was a tall recess forming an apse-like configuration that addressed the audience hall. The westwork connected the Chapel at the tribune level with the court and the Palace. An annular gallery extending in both directions from the throne, divided from the large octagonal central space by a columned screen, joined it to a sanctuary situated on the opposite side of the Chapel. At the ground level the same annular
aisle embraced the central space of the church, connecting the deep porch entrance of the westwork to a sanctuary opposite the entrance and located below the upper sanctuary.

The westwork at Aix-la-Chapelle, though differently proportioned, is partially dependent on the narthex of San Vitale. Flanking this narthex are two round stair towers, one of which was extended upwards to form a cylindrical belfry when Benedictines took over the church in 910, indicating that initially these towers, like the towers at Aix-la-Chapelle, had originally served as a means of vertical circulation rather than as belfries. The motif of the twin-towered basilica facade had been known in the sphere of influence of Constantinople as early as the fifth century, where twin-towered palace gates had been understood as symbols of rulership. The pair of pylons located at the entrance way to the exterior propylea of the late classical temple of Baalbek constructed in the first and second centuries were inherited by a basilican church erected in its main courtyard, the first church to possess a truly monumental entrance way. It was this precedent that was probably followed, although much less conspicuously, in the fifth century facades of Syrian Early Christian churches such as the church at Qalb Lavzeh. Although there may have been continuity in the idea of paired towers as a symbol of rulership, the Syrian scheme of towers hardly affected early Western church architecture. The development of imposing Romanesque facades occurred as a separate sequence; prior to the development of adequately sized bells, there was virtually no use for towers on church facades, a
probable explanation for the late appearance of great towers after the Syrian scheme was discontinued. Prior to the construction of the belfry at San Vitale, Benedictine monks had built some of the earliest known square belfry towers that were actually vertical extensions of the veritable Roman turres integrated into the construction of the church. The earliest towers of this type were not systematic in their location with regard to the church and probably had little relationship to the development of the Romanesque façade.

Through an understanding of the westwork, one is able to grasp the transformation of Carolingian ideas into Romanesque forms: the triple-towered west front as well as the twin-towered façade were already present in the westwork of the Aix-la-Chapelle where one
finds the essential elements of the square central tower structure and the two symmetrical round staircase turrets. In the Ottonian age the figure of Charlemagne had assumed a stature equal to Constantine's, leading to a revival of Carolingian motifs in "copies" of Aix-la-Chapelle, such as the Minster at Essen constructed in the early eleventh century. Here a curious half-hexagon with galleries strongly resembling a fraction of the Palatine Chapel was built as a west front. 11 Above it stands a square facade tower framed by two stair turrets, a startling deliberate juncture of the facade of Aix-la-Chapelle with a basilican church forming a triple-towered west front. It has been called a "classic example of Ottonian 'interpenetration'." 12 The later west front of the abbey church of Notre-Dame at Jumièges, located just outside the vague boundary lines of the Ottonian realm and constructed in the second half of the eleventh century, shows instead careful assimilation of westwork components. Extended in height, the stair towers have become lofty belfries. The disposition of the interior spaces is suggestive of a westwork and it is apparent that the facade with its projecting center portion is an extension of an earlier westwork "tower" structure, but the result in its entirety is an Early Romanesque twin-towered facade. 13 The motif of the twin-towered Romanesque facade, essentially a transformation of the Carolingian westwork, was to find later modification and elaboration in the facade of the Gothic cathedral, just as the predilection for towers that first appeared in the Carolingian westwork was to reflect the aspirations of Romanesque and Gothic architects in the agitated skyline of the Medieval town.
In their adaptation of conventional forms from antiquity to suit new demands, exemplified the westwork, the Carolingians initiated a renaissance verified not only by an acknowledgement of its classical origins, but in its indisputable influence on the succeeding Romanesque period. The development of the twin-towered facade with its lofty belfries from the early westwork of Aix-la-Chapelle flanked with its rudimentary cylindrical stair turrets ascertains such an influence. The utilitarian function of vertical circulation in the cylindrical towers adjacent to the entry structure of the early westwork was aggrandized with the additional demands of the belfry. As the Romanesque tower increased in substantiality and ascended skywards, incidental conveniences suitable to the nature of the lofty, closed, massive structure,
such as its adaptability as a watchtower or defense fortification, became useful secondary advantages. Much more captivating is speculation regarding the purpose of the westwork in its cultural context. Aix-la-Chapelle in particular embodies the precarious balance between church and state characteristic of the Carolingian and Ottonian Empires. Surrounded by a dispersed configuration of nation states, it became a hall of state conveying the ambience of an Imperial sacrum palatium, reflecting the concept of earthly rulership. The direct borrowing by Charlemagne of symbols of authority from Constantinople, Ravenna and Rome, including the venerable twin-towered entrance way for the Chapel with its deep history as a temple, palace, or church front, verifies the importance of the legitimization of his recently vested power. Soon afterwards, his imperial authority was organized through the division of pagan lands and the appointment of suitable bishops to each territory and in the reformation of the large independent prevailing Gallican church into a Latin one, facilitating the establishment of the new liturgical framework that presented the architectural problem of the compound martyrium. The most common, but complex interpretation of the westwork expression as a seat for the emperor and as an architectural accommodation of new liturgical requirements, in addition to its set of rich and diverse additional ascriptions is a reflection of the hybrid form of sovereignty embodied in the inseparable entity of the emperor and the universal Church.
Countess Mathilda (1046-1115) was well-remembered in northern Italy as an energetic papal political figure, an enlightened ruler, a bibliophile, and a patron of the arts. She encouraged the development of the Lombard towns, including the schools of Bologna, then among the greatest in Europe, where advancements were being made in civil and common law and in medicine. Considering the Roman-mindedness of the sovereign, it was not surprising that Romanesque architecture should flourish in her domain and it was no less natural considering the active artistic climate of the period, that creative differentiations should appear, as they did at Florence and Pisa. Local architects, endowed with a sense of the classical, able to profit from a tradition of fine workmanship, provided with a good source of building stone and the means to utilize readily available marble, placed an individual stamp on a number of fine buildings, particularly churches. In 1063, the Pisans laid the foundations for their church on an open site where the free-standing baptistry, the Campo Santo, and the tower later joined it, creating a fine display of juxtaposed marble panelling, arcading and colonnades, one of the most splendid examples of grouped cathedral architecture, a major achievement of the Tuscan Romanesque school.
The twelfth century was an age of tower building. Innumerable tall structures crowded the towns of northern and central Italy, among them the campanile of St. Mark's which had been successfully completed in 1155. Not to be outdone, Pisans resolved to raise the campanile for which their cathedral had long been waiting, vowing to make it so splendid that the tower of the rival city of Venice should pale before it. Over the course of a year foundations were dug to vast depth and innumerable piles were driven. In August 1174 the first stone was laid and Bonnano, the first architect, began construction on the tower. When a height of forty feet was reached, it became apparent that one side of the campanile was sinking out of the perpendicular. Perceiving this settlement as a severe threat to the existence of the tower, Bonnano tried to remedy the situation immediately by moving the center of gravity inside the tower, therefore placing the first, second, and third stories nearer the vertical position. As subsidence continued, the project was abandoned. Sixty years later Benenato, responsible for maintenance of the cathedral group, and having taken an oath not to neglect work in progress, renewed work on the tower which, having in the meantime sunk further, was now even more difficult to correct. He managed to add a fourth story. Soon afterwards, William of Innsbruck restored the structure to a seemingly upright position by simply making the pillars of the fifth and sixth stories longer on one side than the other. But as the foundation continued to sink, he found the situation intractable and abandoned the project. After a lapse of approximately one hundred years, Tommaso Pisano, son and pupil of Andrea Pisano, undertook the unfortunate
enterprise, erecting a bell tower at its summit, again drawing the entire structure slightly closer to a vertical position. If the tower had progressed a few feet higher at this point, the center of gravity would have moved to the outside, causing the structure to collapse. The campanile, now actually curved in shape due to its progressive deviation toward an upright position, leaned thirteen feet to the south and had dropped approximately seven feet below its original grade level. By 1839, the lean had increased to fifteen feet and at the middle of the twentieth century to more than seventeen feet.

After an unsuccessful attempt to stop settlement by cement injections in the foundation, in 1964 local authorities considered a plan by an English consultant J. Pryke that involved reinforcing the foundations, settling the tower on new foundations by means of internal supports, and finally jacking up the base of the tower to decrease the lean by approximately eighteen inches.

The tower stands 184 feet 6 inches high, has a diameter of 51 feet 8 inches, and is constructed with white marble on the exterior and stone on the interior. The massive basement story is faced with half-columns with varied capitals supporting semicircular arches. Above this level are six arcades supported by slender columns differentiated slightly in technique and decorative effect at each zone, an example of over-ornateness at its zenith, visually fatiguing in its multiplicity of detail. The eighth, or summit story, containing the bells is reached by 296 slowly rising steps. The seven bells were placed in the tower with the intent of utilizing
their weight to counteract the inclination; the heavier ones were hung on the higher side. The largest bell, cast in 1655 by Giovanni Pietro Orlandi, and called L'Assunta in reference to the dedication of the church to the Virgin of the Assumption, weighs 3 1/2 tons and is inscribed with an image of the Virgin and the arms of the Medici. The oldest bell, called Giustizia after its original location in the Torre del Giudice where it proclaimed the death of criminals and traitors, dates back to 1262. The remaining bells possess similar individual histories and identifying characteristics.  

The origins of the cylindrically shaped tower are attributed to Byzantine influences such as those expressed at an early date in Ravenna in S. Apollinaire in classe. Other examples of the cylindrical type appeared in Ireland, where their early development and use was rapidly widespread, and in various locations in Belgium, Switzerland, and Germany. The detached square belfry eventually became more popular than the round belfry; often decorated with pilaster strips and corbel tables, it has also been attributed to Byzantine influences. One of the earliest examples of this type was the plain Monk's Tower constructed in the eleventh century near S. Ambrogio in Milan. Perhaps the most conspicuous quadratic belfry, possessing a relatively mature design considering its early date is the Lombard tower at Pomposa, built in 1063. A classical example of this type appears in St. Mark's in Venice; here the surface of the shaft is articulated with lesene culminating in arches and capped with a broadly fenestrated belfry section and steep pyramidal roof.
Rarely adopting the scheme of the twin-towered west facade, the simple basilical facade aligned with the cross section of the nave remained characteristic of Lombardy where cylindrical or quadratic towers were by preference isolated and set alongside the church. Belfries multiplied in the eleventh century because of improvements in bell casting and increased means for production available. It was now possible for almost any church to have its own set of bells, once a tower was constructed for their housing and display. As the cylindrical belfry became more an exception than the rule, the quadratic belfry was to spread rapidly through Lombardy acquiring virtual universality through its continuing use in Romanesque architecture. 5

It is not for artistic merit that the campanile at Pisa has become so widely known as John Ruskin so aptly suggested:

"It will be remembered that I said the tower of Pisa was the only ugly tower in Italy, because its tiers were equal, or nearly so, in height; a fault this, so contrary to the spirit of the builders of the time, that it can be considered only as an unlucky caprice." 6

More powerful than any inherent beauty it may possess is its anomalous image as a tower resulting from its lean. Until recently, some observers believed that the inclination was intended by builders to show their skills or their "unconventional and possibly refractory disposition." 7 Early writers elaborated on how or why this was done, though many of them had never seen the tower, nor the type of soil on which it was built. John Evelyn, who had visited Pisa
in 1644, also falls into this error:

It stands alone, strangely remarkable for this, that the beholder would expect it to fall, being built exceedingly daringly, by a rare address of the architect; that and how it is supported from falling I think would puzzle a good geometrician." 8

A majority of early travellers agree with him and proceed to advance more outlandish theories. A learned Frenchman of the eighteenth century, for instance, explained that the architect was actually a hunchback and deliberately built the tower in distorted configuration to resemble his frame. It was also repeatedly declared that the inclination was symbolic of the declining condition of the Republic whose glorious days were over. An incidental but fortuitous result of the defective stance of the tower was its role as a successful component in the apparatus of Galileo during his experiments with gravitation. An obviously advantageous outcome of the lean is the currently thriving Pisan tourist trade.

The Romanesque churches ranked only after the Gothic cathedrals in size and therefore in their involvement in civic pride, and the largest Romanesque church in Tuscanny is the cathedral at Pisa. For a century after the Pisans defeated the Saracens in a sea battle off Palermo in 1063, their port city was a leading power in the western Mediterranean. The cathedral group, begun promptly after this victory, attests to its perceived greatness at the time. The careful attention given to the situation of its individual components in a spacious greensward
deliberately kept clear over the centuries of the surrounding settlement pattern reinforces its symbolic consequence. Therefore, the role of the campanile in the competition of Pisa with surrounding city states, particularly Venice, and its purpose as a landmark, not merely a representation of itself but also a form of publicity for commercially prosperous Pisa, was probably of greater importance at the time than the more utilitarian functions of the typical Romanesque tower as a campanile, defense tower and watchtower. Though initiated under the reign of a Countess who supported the papacy for one of the most substantial cathedrals of the time, its religious consequence has been further undermined by the mythical phenomenon that has been inextricably associated with it since the commencement of its construction; any architectural merit it may possess is of insignificant importance in comparison to its unrivalled leaning image. This image soon became the most spectacular "advertising for the town."
CITY FORTRESSES

Weakening authority and discontinuity in political institutions in the early middle ages was indicated by the political power vested in the bishop. As the decaying Carolingian dynasty was transformed into an era of feudal particularism, bishops acquired their position through royal designation or simply exercised their rights de facto in absence of any other strong local authority.

The process that transformed the sparsely populated northern and central Italy into the citified Italy of the Renaissance began as early as the tenth century, but the period of sharpest change occurred during the eleventh and twelfth centuries: the population had doubled between the tenth and fourteenth centuries, the citizenry of towns increasing in an infinitely greater proportion, and a widespread movement from the countryside to the town began. The feudal system of land ownership and legal privilege that preceded the growth of medieval towns tenaciously outlived their gradual evolution and decline, eventually dying in the age of Napoleon. Because the nobility continued to own land, the bourgeois were forced to live with their power; the interests of these two groups were continually in conflict, even though it was not always openly expressed. The feudal magnates, neither artisans or merchants, were subject to different laws than the bourgeois, so their value to the city was considered marginal. Although the parties settled down to a

19. Pavia, towers
somewhat mutually beneficial urban coexistence, the fundamental contradictions were deep and ubiquitous.\textsuperscript{2} This far reaching horizontal social fracture was defined by Machievelli:

"The cause of all ills that arise in cities is the serious and natural enmity which exists between nobles and poplani, caused by the desire of the former to command and of the latter not to have to obey them." \textsuperscript{3}

The commune was formed in response to the need by the town, despite existing social differences, for a permanent executive body representing citizens. Through recognition by the western emperor, it replaced the prevailing episcopal authority as the most important jurisdictional power within the city. With the new form of government came new military, diplomatic and administrative institutions that conferred upon the city an awareness of its distinction and individuality. The commune came to signify the citizens as a collectivity or their legislative assembly. But the land-owning nobility established a political independence and form of control that enabled them to set the tone of politics. In some instances three or four families gained by agreement a shared constitutional domination occasionally resulting in joint control of the commune's offices. These formal alliances were known as consortiums. The consortium was essentially an agreement for mutual assistance among nobles. Its most typical purpose was to provide for the erection of a tower.\textsuperscript{4} An oath by the members of a consortium founded in Bologna in 1196 illustrates the nature of this organization:
We swear to help each other without fraud and in good faith... with our tower and common house and swear that none of us will act against the others directly or through a third party. If this tower should become necessary to any of the jurors for his own purposes... the others are to make the tower and house available to him and to help and not oppose him. Matters concerning the construction of the tower are to be settled by the decision of two men chosen from the jurors and they are to decide in good faith what is in the best interest of the kin who swear this oath. 5

The quasi-military domestic tower represented the citified adaption of the countryside keep. The keep, or stronghold, stood isolated as a form of military tower, but more characteristic was the incorporation of the tower in castle or city walls. In many cases the keep was later ringed with concentric curtain
21. Reconstruction of medieval stone burg: circumambient wall and tower

walls and commonly studded with towers that were used as strong points in defensive strategy or in some cases for observation or active defense. Typically Italian castles had high walls topped by elaborate machicolations and stiffened by rectangular or square towers. City walls, a great source of civic pride, were evenly articulated along their length with low towers that presented a closed massive face to the outside, but opened with fenestration towards the town. City gates were occasionally used as watchtowers. Bearing arms or emblems and designed with careful attention to detail, they presented the facade of the town to arriving visitors.

The creation of the city fortress was made necessary by an institution that was itself familiar in outlying areas, the vendetta or blood feud, a traditional violent method for settling or prolonging private disputes resulting from an unwillingness to settle in the courts. In the city it primarily functioned
defensively as a place of retreat under prolonged sieges. It also became conventional for those who were financially able to do so to build a house with a tower or to acquire one by inheritance from ancestors. For this reason the city tower was probably built also because it was considered an acceptable form of house architecture rather than for the sole purpose of carrying out vendettas. Though it has been suggested that tower building may have been motivated by economic considerations and though this may be correct to a certain extent, it is probably generally not the case as many cities had available building space near locations where towers were constructed. The towers were often square and undecorated because of the speed at which they were constructed and the limited availability of appropriate methods and materials. When in some districts towers were closely packed, encouraging fighting as a result, it may have been advantageous to build higher than one's neighbor, but in this case the more typical motive for building high was probably ostentation.

As it expanded and settlement grew dense, the skyline also changed radically, transforming eleventh century Rome into Roma turrita. Until the beginning of the fifteenth century, hundreds of towers were built by the town-based nobility in addition to the extensive number of campanili that soared skyward. However, unlike similar skylines in other Italian towns, the towers were overpowered by ruins and buildings of antiquity. Though there were instances of the widespread destruction of family towers, for example when a short-lived republican commune tore down all of those supporting the papacy, the towers were always
quickly rebuilt in addition to new and stronger ones built from scratch. Sites of ancient mansions were fortified with towers by noble families: on the Forum, around the Colosseum, on the slope of the Quirinal, on the Esquiline, and around the Palatine. They dominated the streets and linked the core of the town to the suburbs and to the family seats in the country.

Towers were used by the families to designate an area of the city under their domination. The Frangipani along with the Pierleoni, the most powerful family around 1100, built mansions all over the Forum, at the Palatine and at the Colosseum creating a neighborhood known as Campo Torrechiato. Additionally they acquired the north slope of the Palatine where access was defended by a tower built against the Arch of Titus known as turris cartularia. The Frangipani continued to acquire towers in critical locations, for example at the end of Circus Maximus, on the Esquiline and along the roads to the Lateran from the west or the north where they were in a position to defend or besiege the popes, depending upon the political circumstances at the time. As the family lost power in the thirteenth and fourteenth centuries, the towers and fortifications went to younger families such as the Annibaldi: as early as the beginning of the thirteenth century they owned or had built towers all over the same neighborhood and at the Lateran had placed a tower on top of an aqueduct that visually dominated the approach to the papal palace. Pope Innocent III commanded that it be removed.  

The towers filled a dominant, decisive role in vendettas and in fights between papal and anti-papal factions. In 1203 a tower-war occurred where the
Capocci class, acting as initiators and villains rebuilt a tower against the command of a chief senatore and attacked the official's tower with

"wooden siege-towers, walls and moats, fortifying thermae and churches round about, and setting siege machines atop an ancient monument". 11

The ancient monument may have been the market of Trojan. As defense against the offensive Capocci five towers were built by several families near the Colosseum. Restricted to a small area, fighting was more that of street gangs rather than real war, reinforcing the possibility that the tower functioned as a status symbol as much as it did as a defense structure.

In Pisa, most houses were towers, vying with each other for height, packed closely together on either side of narrow darkened streets. They were sometimes connected with wooden bridges and furnished with wooden balconies that were very effective in warfare with neighboring towers. During tower-wars light bridges with grappling irons were thrown from tower to tower, doors and windows were barricaded, mangonels sent masses of stone through the sky and boiling oil or lead was poured on the heads of those who ventured down to attack doors. Although advantages of height may be attributable to these type of combative situations, to the difficulty of expanding laterally within city walls, or to ostentation, in Pisa it was claimed that the chief advantage was gained when the nobles gloried in adding tower on top of tower to look down on all of their rivals. 12
The great height of the towers, sometimes reaching 200 feet, caused them to be regarded as a menace to public safety. After exposure to lightning or wind in a storm, some towers would inevitably collapse, pulling down adjacent balconies and bridges in their fall. Though fire often broke out and the commune ordered all wooden structures such as balconies to be destroyed, the attempt to minimize this kind of danger seems to have been largely disobeyed. In a gale in 1325 several towers fell, burying fifty people in their ruins. Ten years later, the Torre di Ferro was split into three pieces by a storm and stones fell, killing people nearby. Not menaces in every instance, one advantage of the towers was that they served as refuges from the frequent conflagrations that desolated wood-built portions of cities.

The Pisan towers were generally built of stone and sometimes brick. The lower walls were strengthened by a vast masonry ogival arch filled with stone or brick and the different stories were supported by arched vaults. Ladders were used to climb between floors. In the masonry there were brackets with square sockets located above them into which beams were inserted to support projecting wooden balconies. Seven to eight feet higher there were corbels for attaching a roof to the balcony. The majority of the towers were crenellated and machicolated.

In 1175 it was forbidden for reasons claimed to be in the public interest to build a tower of greater height than 57 feet and two sworn officials called "captains of the wall" were appointed to enforce the law. At a later time, a height of 95 feet was allowed. There were also laws enacted to control
projectiles: it was forbidden to throw anything from a bridge or balcony at another person or another tower. Repressive measures were enacted against the bridges connecting tower to tower because their vast network was a menace and they deprived the street of light and air. Structures violating the new legislation had their height diminished by one half and a heavy fine imposed. Materials from dismantled towers became the property of the commune and were transferred to an arsenal from which the wood was taken for building galleys and the stone and brick for building docks.

In 1286, the commune stopped all tower building in one quarter of the town because fighting was generated as an outcome of density of vertical construction. Again officials were appointed to investigate the condition of the towers and were granted power to destroy dangerous, weak or defective ones. Occasionally the commune erected towers for itself with the intent of surveying the activities of the nobles, in some cases having to resort to the use of weaponry.

During the extended struggles that finally ended with the subjugation of Pisa to Florence, an inordinate number of towers were destroyed, but the skyline was most severely affected in 1509, when Florentine conquerors demanded that all surviving towers be reduced to a height of no more than 52 feet.13

In Bologna all the towers were erected in the most spatially restricted area of town. The distance between the two most well-known surviving towers, the Garisenda and the Asinella is about thirty-six feet, a greater spread than the spacing of the original closely packed tower groups. It was
believed that the height varied according to the ambition and wealth of the owner.  

The Asinella tower is one of Bologna's most distinctive monuments. Erected at the end of the twelfth century, it suffered damage by lightening, was repaired and later left unscathed by an earthquake in 1505 that leveled many other local towers to the ground. It is 332 feet high and leans four feet.

The Garisenda tower was built at the same time as the Asinella. Truncated and as clumsy as the Asinella is graceful, it nevertheless holds the same rank due to the interest it has generated over time. Dante, a student in Bologna from 1304 to 1306 provided it with an importance its companion tower would never achieve; he used it as an image simply because it leans:

... As appears
The tower of Garisenda from beneath
Where it doth lean, if chance a passing cloud
so sail across, that opposite it hangs.
Its present height is 158 feet, although it was 200 feet high at the time of Dante, prior to the dismantling of its top in the fourteenth century. It leans more than the Asinella, about ten feet, and the lean is more obvious because the tower is shorter. The inclination is explained by some as subsidence of soil, but Goethe believed it was an intentional deviation on the part of the builders:

I fully explain this folly to myself as follows - In time of civic tumults every great building was a fortress for which every powerful family raised a tower. Gradually this tower building became an affair of honor and of pleasure. Everyone wished to boast of a tower, and when finally the upright towers became too commonplace the leaning ones were built. And both architect and owner reached their aim. We overlook the multitudes of upright towers and seek out leaning ones. 16

In Florence religious campanili were highly developed, but private towers, of which 150 have been reported, were more numerous. Even in peaceful times, at best they gave the city a "heavy air of truce". 17 Closed, bare crenelated shafts with removable balconies set on corbeling, their gray masses loomed over the streets. Thirteenth century Florentine consortiums were commonly associated with the Guelph or Ghibelline factions, representing papal and imperial polarization respectively. As soci torri, or tower societies, they had gained tremendous political and social influence and struggled for power and defense of their honor; their principle strategy was retreat into their towers, continuing warfare as they watched the enemy struggle on the street. On one occasion approximately 500 Guelph towers suffered extensive damage during a brief interlude of Ghibelline rule. 18
San Gimignano has thirteen tall towers remaining out of approximately an original 75 which were erected from the twelfth century onwards. Like other towered cities up and down the Italian peninsula it had become a quarreling community where families were constantly at war with one another, in this instance especially those associated with the Guelf and Ghibeline factions. There were also the usual struggles between the magnates and the poplani: the Captain of the People gained the power and position frequently held by the Podesta and limited the special council over which he presided to poplani. Guards were continually kept at both the Tower of the Podesta and the Tower of the People, chains were made for streets and gates and special custodians were appointed for each precinct of the town. But as the struggles became more embittered, the days of the republic were numbered. The Florentines were beginning to treat San Gimignano as a vassal state, and in the
spring of 1349 the commune of San Gimignano was compelled to surrender the custody and government of the state to the Florentines. After 1353 the Florentine Podesta resided in the Palazzo Comunale: its tower, the Torre del Comune was slightly higher than the Tower at the old Palazzo del Podesta which after 1407 marked the limit to which noble citizens were allowed to built their private towers.

Rivalous and active political life was characteristic of the towns of medieval northern and central Italy. In addition to continuous conflict between jurisdictions, local factions and individuals displayed an ongoing struggle: the nobility had brought their castles and keeps to the city and along with them their unruly, violent former way of life. Bloody struggles between the bourgeoisie and the land-owning nobility continued and the nobility battled among themselves as clan was pitted against clan. The towers were the chief mechanism for the manifestation of these struggles. As heavy closed fortresses they were ideal watchtowers or defensive structures: their narrow domineering heights and random window voids were well suited to observation of the enemy, active warfare, or protection in retreat. Stylistically they were remarkably similar to the countryside fortress: commonly understood associations of heavy walls, punched windows, machicolation and corbelling, and wooden balconies were employed by the magnates as elements of verification of their power: the tower was a status symbol. The motive for tower building was tied to earlier associations pertaining to the value of land: active defense and the use of towers as markers to stake out urban territory or as lines of defense was a natural inclination for those familiar
with the importance of territorial claims and the inevitable accompanying defensive activities to the country fortress. The hasty, often insubstantial construction of towers and their dense configuration as a group was expressive of the intense competition generated by the motive of building for display; such careless vigour was reflected in futile efforts to achieve building control through enactment of statues incorporating issues of light, air and public safety. The high jagged skyline was not only an expression of competition between individuals, but also between groups; in Rome, authorization by the dominating authority of one particular group over another meant lowering the towers of the disfavored group, signifying defeat. In San Gimignano when the poplani sought to counterbalance the social weight of the wealthy and lawless with the election of a Popolo, a tower was built to legitimize the authority of the newly appointed political figure. Likewise, when placed under the custody of a rival state, the realization of new authority was reflected by lowering the agglomeration of individual towers to emphasize the tower signifying a new government, to declare political domination on the skyline. Generally, the initial period of self-government by the commune and the recourse to violence as a means of settling differences meant the life of the commune was precarious. The inevitable result was the establishment of a strong local political office, or signoria, or the relinquishment of local government to another state. In both cases private towers were lowered in acknowledgement of the tower representing the municipality. Never had the vicissitudes of politics been so ardently manifested on the skyline.
FLORENCE: PALAZZO VECCHIO

The city-republic contributed greatly to the outlook and growth of its citizens. Through the milieu provided by an active, though contentious, political life they could not help but feel committed to its well-being: the spirit of campanilismo, of the cherished city tower, was alive in citizens who fought with patriotic commitment alongside their neighbors against offending towns. Pride in the city's appearance and the competitive determination to distinguish oneself from neighboring cities were traits common to the city states of northern Italy.  

Man's vanity and his dependence on audience, be it admiring or envious was represented in the use of Gothic architecture for secular purposes in town halls, private palaces and houses. The ambitious cathedral of Siena was a reaction to the cathedral begun by Florentines in 1296. Their Palazzo Publicco was under construction at the same time: it was an attempt to show that Sienna could build more impressively than its northern neighbor. The result was perhaps worth the approximately fifty years it took to complete: it eclipsed the fame of town palaces built earlier in other communes, with the exception perhaps of the Florentine Palazzo Vecchio.

Unlike the abstract conception of government so familiar today, the Florentine state was almost religious in its pervasiveness, denseness and
influence. When its citizens began construction on the Bargello in 1250, their first monumental seat of government, a fortified residence for the podesta and his retinue, a new architectural expression was found in the synthesis of the communal defense tower with a belfry. Here the Florentines had broken the inhibiting mold of Gothic religious expression to initiate some creative developments in civic architecture, starting with the Bargello and continuing in a more comprehensive sense with the Palazzo Vecchio, built after a half century of internecine conflict between the Guelfs and Ghibellines over the nature of the town constitution. The cornerstone for the Palazzo Vecchio was laid in 1299 and the bells were placed in the highest tower in Florence in 1323. Like the Bargello it drew on three traditions of tower building: the closed monumental bulk of the structure resembled a fortress with its powerful battlements and removable balconies and stairs, the ornate windows were adapted from ecclesiastical architecture, and the belfry could be directly attributed to religious influences. Braunfels believed the structure embodied the most essential aspects of the city: the crenelated body resembled the city wall, the tower at its edge was the civic watchtower, and the white marble columns at the top were representations of might and pride borrowed from the imperial rocca of Frederick II. 4

According to Trachtenberg, the symbolism is more complex and actually embodies momentous developments in traditional examples. The military battlement top has been domesticated by the insertion of a windowed story between the corbelling and the crenelations
suggested by the upper story of private residences: what was once harsh militarism now has a sense of play. The openings help to harmonize the crown with the wall below where ecclesiastical windows punched in the massiveness of the facade have much the same effect. Beneath the tower a heavy shaft not visible from the facade was incorporated in the body of the Palazzo; more than simply hidden by the elevation its existence has become ambiguous with the insertion of windows in the facade that provide the illusion of continuity masking and denying the existence of the support. But the daring masking of structural reality does not stop with this gesture: the tower base has been thrust forward so that it aligns itself with the crenellated portion of the facade and rests there as if by negligence on the part of the builders. It appears that the hollow crown could hardly support a load of such magnitude, so the tower leaps skyward, initiating a dynamic tension between the reality of the mass and the deceit of weightlessness.\(^5\) For Ruskin, the configuration possesses anthropomorphic qualities:

> Whether, therefore, we have to do with tower or wall... I am much inclined myself, to love the true vertical, or the vertical with a solemn frown of projection (not a scowl), as in the Palazzo Vecchio of Florence... for the sense of threatening conveyed by this form is a nobler character than that of mere size. And, in buildings, this threatening should be somewhat carried down into their mass. A mere projecting shelf is not enough, the whole wall must, Jupiter like, nod as well as frown.\(^6\)

The dynamism of the tower base is echoed in the combined expression of corbelling, crenellation and
fenestration in the watch-box that tops the tower shaft. Simple corbels and arches have been transformed into elongated spikes. The stringcourse, rather than functioning as a separation is brought down heavily to bear on the pointed arcade. Deep recesses in the solid mass are contradicted with delicate white columns. The crenellations on the watch-box, unlike those below, have become jagged and tooth-like. While the shaft presents a soaring dematerialization that conflicts with the downward weight of its assumed massiveness, the crown writhes with an unrelieved tension resulting from the form and placement of its component elements. The baldachino that rests on top of the watch-box delivers a sacred connotation to the bells of the Signora, a contradiction that refuses to be resolved by the arched corbeling that encircles the superstructure and attempts to shed ecclesiastical associations in its relationship to the crenellations below.

For the commune at Florence, full of civic pride in the 1330's, it seemed only appropriate to build a bold vertical expression, but the driving force beyond a decision of such magnitude had to run deeper. The Palazzo Vecchio was constructed at an unprecedented speed; it had even interrupted construction on the cathedral project. Why did the young vulnerable government so desperately need the dignified security of a monumental edifice? In the tower-wars of the magnates, the first sign of victory was destruction of the opponent's tower or keep, ruining the base of power and in the process deprecating pride. Utilizing the advantage of a traditional approach to serve new conditions, the first act of the Popolo when coming into power was to decree a leveling of all private towers to a limited height. However, such widespread
attempts at demolition did not suffice. The consortia with their towered urban castles and rural strongholds were adamantly resistent, a threat to the young republic. One of the first deeds of the priorate after completion of the Palazzo Vecchio was to legislate a statute calling for the dismantling of private towers to one third of its height. Other statues prohibited the use of war machinery on the "resulting stumps", indicating that if such a violation did occur, the tower of the offender would be razed to its foundations and the individual responsible for the offending action would have both hands amputated.

But despite stiff regulations the lawlessness of the nobility continued. In the 1330's several magnates were convicted of serious offenses of communal laws including arson, murder, devastation of church property, attacks on communal fortifications, highway robbery and treason. None of the sentences were executed because for a minor fine a magnate could have the most serious condemnation annulled. Considering this example, it is not surprising that towers remained armed and continued to stand at their previous illegal heights. Towards the middle of the fourteenth century a puritanical government came into power, laws were more strictly enforced and the commune permitted many of the magnates to become citizens, encouraging their power as a group to fracture, channeling it instead into the common good. It was at this time that the statute decreeing the dismantling of the family towers seems to have taken effect. As the towers were lowered and disarmed, the city erected a number of large scale campanili in addition to the Bargello and the Palazzo Vecchio. The change in the cityscape over the course of a century was remarkable. Earlier the
streets of Florence were deep shadowy canyons of violence winding through the individual domains of private keeps. When the looming fortresses were reduced in size the citizenry of Florence became newly aware of the prominent church and civil bell towers collectively built.  

Although the focus of the typical medieval town was the worship of God, according to Mumford the town hall was built not only as an expression of political power and civic pride but also to fill the critical dual role of a "collective palace for the patriciate" and a symbol for the merchant guild as well as its meeting place.  

For Trachtenberg, the control asserted on the skyline of Florence through the tower of the Palazzo by the governing bodies of the time, essentially extensions of the logic of the consortiums, was limited in access and representation. The power of these groups was legitimized through an almost frightening architectural expression in the combination of countryside fortress with a church belfry "humanized" with ecclesiastical and palatial embellishments, details that only reinforced contradictions arising from the simultaneous use of stylistic sources with disparte associations. Despite such contradictions, the image of brute strength was overpowering. The role of the Palazzo Vecchio as a symbol of a limited access group was reinforced later when the Medici family concentrated all the matters of Florentine banking in their hands and issued a proclamation that all towers owned by individuals should remain lower than the Palazzo Vecchio, the headquarters of a government that was in actuality inextricable from the
Florence, view of the campanile of the cathedral and the tower of Palazzo Vecchio

Trachtenberg claims energetic construction on the tower of the Florence Cathedral was pursued immediately after the completion of the Palazzo Vecchio in an effort to meet this need. Though lower in height, its use of variegated marble and elaborate detail led it to command as much attention on the skyline as the tower of Palazzo Vecchio.

Neighboring Siena displayed an ostensibly similar skyline situation, however additional underlying motivations were involved. It was claimed that its Palazzo tower, obviously influenced by the Palazzo Vecchio, had to be particularly imposing so that it would dominate the Cathedral. But later drawings indicated that the visionary Sienese cathedral project, the Duomo Nuovo, would have been accompanied by a new campanile just as high as the tower of the Palazzo. Such a phenomenon can be partially explained by the desires of Medici. The Palazzo tower had failed to fulfill the instinctive need in all Florentines for a tower of their own or at least membership in a "tower group".
particular groups to outvie one another with tower construction, but such aspirations were increasingly recurring at the time: Giantism had become a progressive, widespread phenomenon. Not only did campaniles and Palazzo towers grow, but also Gothic cathedral naves, as indicated in the progression from Laon to Chartes to Beauvais, and towers, as indicated at Strasbourg. The cult became competitive more often between towns than within towns; most towns acquired a civic symbol in one large tower. Even in situations where a singular tower image was not apparent, as in Florence, in the greater context towers shed associations with specific local groups and encouraged the spirit of campanilismo through a distinctive manifestation of the meaning of the city as a whole.
BRUGES: THE BELFRY

The growth of the commercial city was a long process because it was met with resistance by both the structure and the customs of the early medieval town. Change was slowly brought about by a new kind of commerce that developed outside the domain of individual guild regulations, and with the growth of long-distance trade a new urban civilization gradually emerged.

Flanders represented that portion of Europe where the connection between urbanism and trade found its highest expression. ¹

The relationship between the Flemish state, represented by the Count of Flanders and his officials, and the Flemish towns was exceptional for its time. Independence from France combined with the eminence of the Flemish counts, brought what had previously been a French feudal country to a height of political maturity that existed nowhere else in Europe in the early twelfth century. If the county of Flanders had been oriented towards agriculture, such prominence might not have been achieved. Its disproportionately great political fortitude was due chiefly to the intensity of its urban commerce, a result of long-distance trade. One of the most powerful communal cities of Flanders, Bruges, along with Ghent, Ypres, Arras, Douai, Lille, and other small towns in the immediate vicinity, created the first center of a textile industry that supplied the world market of the time, exercising a

26. Bruges, view of the Grand Place about 1640 showing the completed belfry
powerful influence over the fortunes of Western Europe.²

The commercial achievements of the Flemish towns were rivaled only by the towns of Northern Italy. In their specialized field of cloth production they were unequalled, denoted by the fact that Flemish cloth was a key item of trade in the distant Orient and that the similarly developed Florentine cloth trade attempted to duplicate the cloth of such Flemish towns as Ypres, Douai and Arras. The volume of cloth production achieved a significant level in the thirteenth century and increased further at the beginning of the fourteenth. The position of monopoly enjoyed by the Flemish cloth industry was reinforced when Bruges became the continental trading center for wool around 1300. By 1293, the brokers or "factors" of Bruges had established their claim to act as intermediaries in every wholesale transaction. The merchant who had earlier marketed wares abroad had at this time almost given up the practice, because now merchants from all over Europe were actively buying and selling in Bruges. Direct dealing between one foreign merchant and another was prohibited so a complete profit was assured for the local merchants: the entire turnover of goods in Bruges passed through their hands.³

The lively port of Bruges was in all respects the most prominent harbor of Northern Europe, the place on which all the lines of commerce converged. The form of the town was decisively affected by trade. A tremendous amount of energy and financial sacrifice was devoted to civic improvement: public buildings and fortifications were considerable and the huge wall of 1297, at least seven kilometers long, could only be
27. Bruges, plan

financed with the help of Italian bankers. Ecclesiastical parish churches and an unusual abundance of monasteries and hospitals fit neatly together into a complex whole within the protection of a great encircling wall. Technical achievements reinforced the sense of pride in the energetic commercial center. The personal weighing machines of foreign merchant's associations made redundant the municipal scales converted from the balance in 1282. Through representation on the canvases of Bruges painters, the tread-wheel-driven Bruges crane achieved a unique fame. Most significant technically because of its supreme financial importance was the continual working of the waterway of the town in which large sums of money were invested. The great sluice of Bruges was an engineering wonder of its time. The Wasserhalle was one of the chief markets of Bruges, so designated because it spanned a canal and brought cargo
by barge into the market from below. But it is the
Bruges Halles with its belfry that shows civic archi-
itecture at its best: it was the highest expression of
the significance of the organization of trade to local
government, an indication of dignity, display, a sym-
bol of autonomy and wealth.

Dominated in the middle of its facade by the noble
belfry, the Halles commanded the narrow side of the
Grand Place. The foundations for the belfry were laid
in about 1290 and the wings that formed the Halles and
enclosed the courtyard were added in 1364. The belfry
tower is comprised of a series of stacked volumes.
The two lower volumes were constructed initially; the
upper portion of this early tower was finished with a
corbelled attic story that recalls the Palazzo Vecchio
and flanked at the corners with jutting turrets, a
distinctive characteristic of the Flemish belfry that
differentiates it from local ecclesiastical towers.
Within six years the tower was extended, again finished
with the characteristic corbelling and turret features.
By 1482, a large central slender octagonal turret with
high gothic windows and a lofty fleche crowned the
massive lower tower; reducing its heaviness, it grace-
fully lifted the tower in its entirety skywards. In
addition to housing valuable community documents and
charters, one of the most important functions of the
belfry was the protection of the town bells, a source
of local pride that was closely guarded by citizens;
during wartime they were not uncommonly confiscated
by the enemy upon destruction of the tower. With its
commanding height of 270 feet, unquestionably domina-
ting the skyline of Bruges, the belfry and its elegant
culmination was probably one of the most impressive
urban landmarks in Northern Europe.
The Flemings shared the desire with other peoples of the world to express their ideals through the erection of buildings encompassing the spirit of the individual as well as the community at large. They were considered industrious and enterprising wherever commercial success was likely to reward their efforts, they were religious by temperament, and knew no bounds to their ambition. Though the Middle Ages is known to have bequeathed great masterful works of architecture as a direct consequence of the enthusiasm for spiritual expression, church building took a secondary place in Bruges and other Flemish towns for a time. Large, finely conceived churches were erected, but ecclesiastical work was eclipsed by town halls, belfries, market halls and other secular buildings that arose in response to the calls of civic splendour and domestic affluence. The role of the Bruges merchant was in transition: originally economic achievement resulted from the efforts of protected producers concentrated in early guilds, but with the expansion of trade in geographic and transactional scale, merchants realized their ability to achieve immense financial gain and the advantages of an evolving social hierarchy based on individual enterprise. Their newly acquired wealth was reflected in a group of commercial and civic building projects that elucidated the Flemish adaptation of Gothic architecture. Construction methods and motifs were borrowed from builders in Northern France, where experimentation was being conducted by master masons on the pointed arch and the ribbed vault. The potential of these forms was too strong for the Flemish builder to ignore and a building approach evolved that bore the impression of local market characteristics. So forcefully were these characteristics developed and
expressed that they markedly differentiated Flemish architecture of the time from that of any other country. The Florentines had secularized ecclesiastical motifs, extending details of Gothic architectural expression to the contemporaneous Palazzo Vecchio, but the fortress aesthetic overpowered the Gothic influences leading Frankl to observe that the facades of the Palazzo can "only be called Gothic if one applies the term blindly to anything built during the Gothic period." He continues with the assertion that Flemish belfries are Gothic due to their aggregation of Gothic characteristics, for example, the windows with pointed arches and tracery, the central tower and its pinnacles, the tur- reted corners, and the steep roof. Unlike Florence, where the campanile of the Cathedral and the tower of the Palazzo appear in tandem, in Bruges the belfry reigned in unquestionable singularity over the skyline: the phenomenon of Giantism had been transposed to the North. In its domination of the town, the belfry declared the preeminence of Bruges as the commercial center of the north prior to the fifteenth century. Consequently, in its more direct manifestation of Gothic stylistic tendencies, and in its indisputable command of the skyline, the Bruges belfry assumed a character quite divorced from conformable town belfries such as the Florentine Palazzo Vecchio: it came uncomfortably close to feigning the role of the Gothic cathedral in the typical medieval town. Considering the pervasiveness of the Church in western Europe at the time, it appears obvious in the face of such an anomalous expression that mercantilism and its display, at least for the Flemish merchant, had assumed a level of consequence and meaning rivalling religious pursuits.
STASBOURG: THE SPIRE

The most pervasive influence in Western Europe after the fall of the Roman Empire, the Church visually controlled the typical medieval city: the image of the community, conceived as an entity by citizens and builders, was generally expressed through the dominance of the cathedral spire and recalled in the parochial churches and civic buildings scattered throughout the town, generating a design reverberation that provided richness to the totality. Towers and high facades set behind short approaches and blocked vistas forced one not to see a sweeping panorama, but to look skyward. What was once closed behind the walls of the monastery was now visible to the entire community: if one building was to be understood as the key element in the organization of the medieval town it was the cathedral, the focus of a collective structure whose main purpose was to pursue a Christian life.

In the feudal period as cities were formed, with the increasing power of the bishop many cathedrals underwent enlargement and improvement. In the most important towns in Western Germany, such as Strasbourg, the bishop wielded the political power: his dominion over the populations had been confirmed in the tenth century by Ottonian imperial and episcopal policy. Until the twelfth century it appeared as if the power of the bishop would eventually transform the entire urban population into a passive object of the lord's will.
to dominate. But as cities gained economic strength the authority of the bishop diminished as the power of the burghers increased. Then began a long period of altercation between the bishops or lords and the burghers striving for autonomy that was not to be resolved until the fourteenth century. This period of transition in the political life of the burghers was filled with innumerable instances of bloodshed, including the battle on the field of Hausbergen where the people of Strasbourg fought for their will to govern in 1262. Success for the burgher's movement was assured when the collective management of the town was taken over by the central authority of a council, much like the one that had initially developed in Italian towns. The bourgeois class with its newly acquired wealth not only sought greater political recognition and influence, but expressed its economic strength through greater participation in the construction of cathedrals. However, such financial contributions entitled donors to privileges, especially the right of burial either inside the church or in adjoining chapels. To suit this demand required not only a larger building, but increased subdivision of space. The inevitable result was the development of rings or families of parochial churches around the cathedral, an expression of bourgeois power. Such development did not detract from the importance of the cathedral as the symbol, pride and possession of the city.

To fulfill the practical needs of everyday life, the cathedral functioned as a community center: it was not considered too sacred to be used as a dining hall for a large festival, a theatre for a religious performance, a forum for oratorical contests among
religious scholars, or perhaps even a safe deposit box behind the altar where deeds and treasures might be placed. Because of its visibility from the countryside and its inevitable association with the town market, it also functioned as a great stimulus to the economic life of the country.

Of greatest importance however was the spiritual role the church filled: it was invested with a symbolic content relating to man himself, God, and the Kingdom of God. It was not medieval architects who speculated on the meaning of the church but theologians such as Suger and Durandus. Durandus, whose The Symbolism of the Churches was considered to be commentary of the highest authority in the thirteenth century, was partially responsible for early liturgical formulations on the cathedral as a representation of the City of God or the Heavenly Jerusalem, upon which all medieval authors agreed:
And I John saw the holy city, new Jerusalem, coming down from God out of heaven, prepared as a bride adorned for her husband... And he carried me away in the spirit to a great and high mountain, and showed me that great city, the holy Jerusalem descending out of heaven from God. ³

This is followed with a description of the city, which is called the city of Light. The walls consist of twelve kinds of precious stone, and there are gates on every side, each gate consisting of a single pearl. The gates are named after the twelve tribes of Israel and the foundations of the wall after the twelve apostles. The streets were made of pure gold, as if it were transparent glass. The city, its dimensions, its geometrical form, precious stones, pearls, gold and glass, are all symbols and in combination symbolize the Kingdom of Heaven. Durandus continued his discussion of the cathedral as Heavenly Jerusalem through the attachment of significance to particular parts of the earthly structure, here specifically referring to the towers.

The towers are the preachers and prelates of the church, which are her bulwark and defense. Whence the bridegroom in the Canticles saith to the bride, "thy neck is like the tower of David builded for an armoury." The pinnacles of the towers signify the life or the mind of a prelate which aspireth heavenwards... ⁴

For Durandus, the physical act signified the spiritual reality and the material building signified the realm of the immaterial. He believed that the living stones of earth would one day be part of Heavenly Jerusalem and that the citizens of both earth and heaven are in communion and both participate in the

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³ Jan Van Eyck, St. Barbara before a Gothic Tower, 1437

⁴ 50
31. Jan van Eyck, "The Adoration of the Mystic Lamb", Ghent Alterpiece, 1432

symbolism of physical building. The towers are a signification of the intimate connection between earth and heaven.  

The meaning of the tower, one of the most prominent components in the assemblage of the cathedral, has been a source of varied speculation and interpretation. In a painting of St. Barbara by Jan van Eyck, the Gothic tower of monumental proportions looming in the background embodies the medieval sense of spiritual devotion as expressed by St. Paul who claimed that all Christians were "god's builders" working incessantly on a structure not to be completed until the day of judgement. In Flemish tradition the symbol of the tower originally signified that Barbara had been imprisoned by her pagan father to protect her beauty from defilement. According to the legend, her father discovered her conversion to Christianity after she caused the workmen to build a chapel with three windows as opposed to a bathhouse with two as he had authorized. Jan van Eyck transferred the tower of imprisonment to the tower of a cathderal in the course of erection, calling to
mind Durandus' relationship between the physical act and spiritual reality. The concept recurs in Jan van Eyck's representation of a city in "The Adoration of the Mystic Lamb" in the Ghent Altarpiece. The agglomeration of towers, though they are non-institutional in character, and though they are associated with the Romanesque style represent the same aspect of spirituality and ultimate goodness that the Gothic cathedral embodies in its representation of the City of God. 7

This idea of the city is echoed in the entrance front of the cathedral. Otto von Simson discovered in the facade of St. Denis a source in the reconstruction of the Roman gate at Cologne: the twin-towered cathedral facade with its three portal openings is a "veiled representation of the city gate." 8 The gate at Cologne was similar in scheme to such Roman gates as the Harbour Gate at Ephesus and the West Market Gate at Miletus where the three portal openings alternated with four ionic distyle projections. The architecture
of the columnar facades was inspired by the stage-building of the Roman theater, gradually rationalized and monumentalized to meet the requirements of everyday public building. 9

In the development of the tower and spire in relationship to the cathedral, the reconciliation of the vertical expression of the towers with the horizontal length of the nave posed an intricate problem for Gothic architects. In solving the issue of the twin-towered facade, the special features of the building on the west, north and south fronts had to be brought into harmony with the nave elevations. It was important that the towers appeared to grow organically out of the main structure below them. Two contradictory demands had to be met: the expression of the basilical interior on the facade and the incorporation of the towers as flanking features into the cathedral front. In addition, the facade had to accommodate great portals leading into the nave.10 The Romanesque architects had faced similar challenges in the integration of the westwork with the front of the basilica. Their varied resolutions of the interrelationship of the entrance, the towers, and the nave to the west front were to become a final cohesive solution in the hands of Gothic architects where in the plasticity of the facade every detail reinforced the larger scheme. The immutable organization of the Gothic twin-towered facade was derived primarily from eleventh century Norman fronts such as St. Etienne at Caen. Here the massive substructure was divided into three sections, each containing an entrance corresponding to the aisle of the interior. Buttresses guide the eye towards the towers as they rise continuously from the self-contained
block below. As a whole it is a straightforward, cohesive solution that satisfied the early demands of both the towers and the facade. In *Gothic Architecture and Scholasticism*, Panofsky discusses the development of the classic phase in Gothic architecture, indicating that progression was consistent but not direct. Using the classic solution of two front towers as an example, he questions the reason for the roundabout approach that began with the twin-towered front of St. Denis, progressed to the multinomial group of towers as exemplified at Laon and in the initial plan for Chartres and eventually to Amiens, where finally the initial disposition of only two front towers was reinstated. Although this may at first appear to be an arbitrary deviation, he believes it is in reality the prerequisite of the final solution. The many-towered group at Laon was an effort to vertically balance longitudinal and centralizing tendencies. As if in protest, or perhaps because their cathedral was on the crest of a hill, the masters at Laon reverted to the use of many towers, a gesture reconciled only in the construction of two more cathedrals by succeeding generations where towers surmounting the transept and crossing were successively removed. With the construction of Amiens the contradictory ideals of the uniform progression from west to east and of transparency and verticalism, expressed in the disposition of towers and spires, had finally achieved reconciliation.

The spire was the most powerful expression of the heavenward urge on the part of the Gothic builders. It also perhaps more than any other feature marks the communal spirit, along with municipal power and
prosperity as the governing feature of the medieval town. Prior to the twelfth century nothing like the true spire had existed, no precedent was available to guide constructors. The schools of the Ile de France and Normandy advanced along similar paths, but it was probably at the Ile de France that the Gothic spire was developed. It is difficult to determine what the exact stages of progression were as it is always possible that a spire was added to a tower long after completion. However, in the Ile de France it is possible to trace the evolution of the spire in the twelfth century through a series of towers beginning with the plain pyramidal roof to the forms where the transition is crudely facilitated by means of angled turrets and dormers until the fully developed spire emerges. In the skillful transition from the square base to the upper reaches of the diminishing octagonal pyramid, the eye travels smoothly, scarcely noticing a change in form. As in every other part of the edifice, perseverance in this transitional period made possible the final perfection of the Gothic form. The roofs of Romanesque towers were closed and could only be reached from the inside, but Gothic spires allowed the interior and exterior to merge, symbolizing the disappearance of the boundary between God and man. 13 An impression of effortlessness is conveyed. For this reason the most Gothic of all spires according to Frankl is Strasbourg: when progressing up through it one is paradoxically inside and outside at the same time. 14

The first design for the facade of the cathedral at Strasbourg, or Plan A, was made either by the elder Rudolf who was working on the choir in 1240 or the
younger Rudolf who was completing the western bays of the nave. The second facade design, Plan B, was created by Erwin in about 1275 and constructed to a height of 65 feet until interrupted by a fire in 1298. Dehio called it "the most beautiful thing that was ever devised in the Gothic style anywhere in the world". However, the upper parts were executed under later designs, in the end creating a facade of disparate elements appearing to lack harmony. At the time Ulrich was working on the facade at Strasbourg it was decided to have only one spire, so when Master Gerlachus had completed the north tower in 1365 he added between 1384 and 1399 a central piece over the rose-window with the intention of building above it. At this point Ulrich suggested instead that the north tower be continued asymmetrically. He lived to see the octagon and four octagonal turrets completed, but their spires were never built.

Ulrich had originally designed the spire for the tower at Strasbourg beginning in a concave recession with four ascending groups of eight pinnacles on the ribs above it. Dehio viewed the pinnacles as "stuck on candles" and said the outline of the tower "would have looked delightfully blurred from a distance." Johannes Hultz, continuing the work in 1419, developed from this plan seven wreaths of short turrets in which one is able to climb an open spiral stairway to the top to observe the surroundings. The fifty-six little towers were intended to carry spires that were never built. The contour of the tower in its intricate jagged outline shifts continually from foreground to background. Rising high above the town roofs, it is a cage of tracery, an aerial fantasy that represented
the aspirations of the designer and the age in its originality and technical mastery. Deeply impressing later generations, it is because of the spire that the tower at Strasbourg has been claimed the eighth wonder of the world. 18

Because of its exemplary Gothic quality, its majesty and perhaps simply because of its height of 467 feet that for a long time made it the tallest structure on earth, the tower and the cathedral at Strasbourg have been continually praised over the years from the time they were created to Goethe's day and down to the present. Aeneas Silvius (1405-1464) was a self-taught Humanist, geographer and historian who subjectively, yet critically, observed the cities in Europe of his day. After a discussion of Strasbourg and its canals he turned to the cathedral:

... the episcopal church, called the minster built most magnificently of cut stone, rises as a very extensive edifice, adorned with two towers, of which the one that is completed, an admirable work, hides its head in the clouds. 19

Silvius considered the tower of Strasbourg a mirabile opus. In his laudatory enthusiastic remarks, surprising in their favor of the Gothic when considering they are the words of a Humanist, are found the beginnings of Goethe's panegyric of 1772. He continues, according to Wimpheling's history of the German people, Epitome rerum Germanicarum of 1502:

In my opinion, the Germans are wonderful mathematicians and surpass all peoples in architecture. An Italian asserts this of the Germans, and he has not said anything untrue, as is abundantly proved by the cathedral in Strasbourg,
and the tower connected with it, even if one ignores the other buildings that have been erected on a most magnificent scale elsewhere in Germany. Who can admire enough or praise enough the Strasbourg tower, which easily surpasses all buildings in Europe in its carved ornamental work, statues and sculpture of manifold objects and which has a height of more than 415 ells? It is a miracle that one could raise anything to such a height. 20

For Silvius the concepts of mathematics and architecture were identical; he admired the geometrical method of German architecture. Wimpheling was amazed with the mechanical achievement of raising stones to the height of the Strasbourg tower. 21 Laugier, a Jesuit priest born in 1713, found that the Gothic alone expressed the intent of the Catholic church. He was confused however by the respect he felt he owed to Vitruvius, Vignola and Palladio. His dithyramb on Strasbourg has been forgotten in writings on the subject; he is remembered only for his worship of antiquity:

Our forefathers excelled in the construction of towers.... They discovered the secret uniting lightness and delicacy of work with elegance of forms; and avoiding equally the slender and the massive, they attained that degree of precision from which results the true beauty of these kinds of work. Nothing of this sort is comparable to the tower of Strasbourg Cathedral. This proud pyramid is a masterpiece, enchanting in its stupendous height, its exact diminution, its agreeable form, in the correctness of its proportions, in the singular refinement of the work. I do not believe that any architect ever produced anything so boldly imagined, so happily conceived, so precisely executed. There is more art and genius in this one piece of work than in all the marvels that we see elsewhere. 22
At this point he grows reserved and solemnly suggests that towers of this type, differing from modern structures, should not be imitated despite their attributes. Goethe probably read Laugier's enthusiastic words of praise for Strasbourg prior to writing his own version, called a masterpiece of the highest rhetoric in the sense that language is used to captivate and intoxicate the reader.23

It rises like a most sublime, wide-arching tree of God, who with a thousand boughs, a million of twigs, and leafage like the sands of the sea, tells forth to the neighborhood the glory of the Lord, his master.... All is shape, down to the minutest fibril, all purposes to the whole. How the firm-grounded gigantic building lightly rears itself into the air! How filagreed all of it, yet for eternity.... Stop, brother, and discern the deepest sense of truth... quickening out of strong, rough, German soul.... Be not girled [sic], dear youth, for rough greatness by the soft doctrine of modern beauty-lisping.24

To thoroughly understand the way Gothic was viewed in particular periods of time, the view of the Impressionists must be included. This view is perhaps best conveyed by Auguste Rodin (1840-1917) in his book Cathedrals of France. Published late in his life, when the spirit of Impressionism was waning, it is nevertheless filled with an enthusiasm reminiscent of Goethe's earlier writings. With sketches and poetry Rodin provides a vivid interpretation of the spirit of Gothic architecture:

This cathedral is the scaffolding of heaven. It gathers itself for flight, it rises, then stops the first time to rest on the balustrade of the first tier; then the construction resumes its skyward flight. It stops at the limit of human powers.25
He illuminates well the role of the cathedral as the focus of the medieval town:

Things appeared to me more lofty, purified. They faded to nothing, transformed by glory. Lights that emphasized the first planes were interrupted to take more power in following the ascendent lines, leaving the porches to fill with mist, to be dissolved in shadow, while beyond, the cathedral thrust its audacious framework to heaven.²⁶

But however overwhelming the superworldly quality of this architecture and however poetic its conception or reflections of its inspiring loftiness and beauty, one must remember that it emerged in a clearly defined period of history and that the structural logic with which it was erected and the precision of its detail, better described as the "mathmatics of the classic cathedral", could not have come strictly from the orientation of a poet.²⁷

From the construction of the earliest cathedrals onwards, the height from the floor to the keystones of the vaulting steadily increased. Likewise, a progressive, though indirect, attainment of height was achieved in the construction of towers, as in many instances concentrated energy was channeled into completion of a single higher spire as opposed to two lesser spires. The pervasive cult of Giantism does not fully explain the desire of the Gothic architects to achieve expression of technical acuity in vastness of dimension. A single constituent in a larger set of concerns, the attainment of height was perhaps recognized not as an end in itself, but rather as a final compensation for careful attention to the integration of a variety of conflicting constructional considerations. The lofti-
ness of the tower virtually relegated the previous utilitarian functions of belfry or watchtower to insignificance: a climb to the spire was a time-consuming undertaking and the bells lost prominence in their distant location. Instead, the spire not only contributed to the symbolic power of the church as an entity, but also established the strength of its relationship with the surrounding countryside. Although in all probability dulled by the extremely lengthy, arduous construction process, the sense of competition with neighboring towns was coincident with the goal of creating an ever taller, more elaborate structure and with the conception of the cathedral as an extension of the city. In its interdependence with the countryside, the city was the market for local commodities. As a representation of the city, the cathedral was inseparable from its mercantile image: the preeminent tower was a symbol of economic viability, spirit, and solidarity. Such intense aspirations to propagate the city on the skyline, to link heaven and earth and to realize monumental heights had not been attempted since Babel. But the unquestionable authority and the pervasive influence of Christianity meant the current motives for tower building were of another genre. Perceived as the City of God, the cathedral was accorded comparable reverence. The tedious construction process was justified by the belief that building the material church signified building the spiritual church, the progression towards the day of judgement, and therefore towards heaven. Such a building task, and toleration of its slowness and arduousness was now encouraged by God rather than condemned. Later interpretations, formulated in the face of the completed artifact rather than in the
midst of the construction process understandably focused on the comprehension of visible results, or the aesthetic of the cathedral. Such an aesthetic was in actuality the result of an ardent search by twelfth and thirteenth century masters who through ideals such as transparency, the impression of the ethereal; and verticalism, unsubstantial weightlessness and soaring space, hoped to give material form to the supramundane. The massive closed Romanesque towers had been built under the conception that God was a supreme, unapproachable being. The Gothic architects instead acknowledged the Christ in his suffering, and therefore God, was close to man: the heavy pyramidal Romanesque roof elongated, dematerialized, transformed into the diaphanous spire.
VILLA D'ESTE

In the medieval town the progression was slow through winding corridor streets and the viewer was able to appreciate the endless transformations of mass and silhouette. But in the fifteenth and sixteenth centuries, cities were transformed through opening, clarification and the controlled integration of classical elements. With its air of decorum and regularity the new architecture broke up the harmonious consistency in the randomly built character of the medieval town. Clarity and simplicity was expressed in the two-dimensional facade, the arch, the lintel, and repetition of formal elements. Implicit in this approach were the beginnings of the organized, continuous, measured and extended Baroque conception of space: a change in spatial organization that corresponded with a slow shift in authority and influence: over the course of four centuries medieval universality or the absolutism of God and the Church were to give way to the centrality of power vested in the temporal sovereign and the national state. Rather than concentration on eternal life, to display wealth and extend power, to concentrate on what may be mastered in a lifetime became universal guidelines.

34. Tivoli, Villa d'Este, section and plan

In the Italian gardens of the sixteenth and seventeenth centuries, the main concern of the architects was the organization of space according to the principle of limited views. The gardens were inevitably linked with a villa of comparable dimension and usually extended
for no more than 200 yards. The garden as an architectural object, perfected and measured, was placed into an irregular landscape, sharply contrasting with the surroundings or gradually merging at the edges. For this reason the villa often functioned as a belvedere: the limited controlled prospect offered by the garden was surveyed and enjoyed in addition to the naturally landscaped panorama of infinite distance. The entire symmetrically arranged design was dominated by this all-embracing view.

The earliest example of this type of villa and garden arrangement was the Villa d'Este at Tivoli. Begun around 1566-67 by the architect Pirro Ligorio, it was designed as a "house of entertainment" for Cardinal Ippolito d'Este. Later, it was successively passed to two other cardinals of the house of Este until the seventeenth century when it was inherited by the ducal house of Modena. The length of its facade as originally planned is incomplete. Designed to merge inconspicuously with its surroundings, it is dry and palatial and from the village square only part of the high blank front facade is visible. The street entrance leads to a court enclosed with an open arcade. From a corner in the court a stairway descends to the garden side piano nobile of the villa. A long progression of rooms overlooks the garden. The central room opens onto a great two storied portico or loggia that is connected by a descending outer stairway to a terrace running the length of the building. The villa and terrace, or belvedere, tower above the greenery, high and detached, commanding a view of the lower gardens. Descent from this platform is by a grand system of staircases, based on Bramante's prototype of diverging
ramps at the Cortile del Belvedere. From the center of this high platform to the depths of the garden the incline is long and steep until it meets the awe-inspiring infinite green distances and the cypress shaded pools of the lower garden.

The Villa d'Este was influenced by the Cortile del Belvedere, part of a papal building program intended to visualize the new papal policy of the creation of a national Italian empire, an opportunity provided by economic crises and the decadence of the nobility. Here for the first time the natural landscape was rationalized as an architectural element and the concept of the belvedere was generated in successive rhythmic stages through the manipulation of the terrain.
the palace and Villa of Innocent VIII that rose from an area of vineyards and gardens. A dual character was achieved through the use of the wall as a backdrop for the garden inside and as a city wall facing the outside. Through extension across the width of papal territory, Bramante had introduced a new planning concept, bringing to an end the medieval approach of agglomeration about a core and substituting spatial growth, movement and climax, concepts which were later to be fully realized in Baroque design. One of the greatest influences on later Renaissance architecture, it encouraged widespread development of the garden. When the construction of the Cortile was far enough advanced to permit conceptual understanding, almost every villa and palace in Italy, including the Villa d'Este, was joined to its exterior with a plan that rationalized the surrounding space seemingly through an outward projection of the building itself.6

Unlike the typical villa suburbana, the Villa d'Este had slightly protruding wings clearly articulated as towers that were added on its garden facade in 1569, after its completion. An engraving by Duperac shows the towers topped with two turrets that rise above the building roof, another form of belvedere. As the broad flat platform upon which the villa rests raised high above the garden below, even the low towers "command a fine view". Though the two belvederi were never built, the towers were constructed in preparation for a visit to the villa by Pope Gregory XIII that took place in September 1572. It was mainly for this event that the villa received its final form.7 According to van Moos the towers openly alluded to traditional images, including Lombard castle architecture, and were used in papal
building campaigns where they functioned as "highly visible images of power" or as representations of papal sovereignty over public life. Increasing political and economic power of the papacy had recently provided the circumstances for a papal dictatorship. In subsequent building campaigns, of which the Cortile del Belvedere was a part, the tower articulations were used repeatedly on such projects as the Palazzo S. Biogo and the Palazzo dei Tribunali. The explanation for the choice of the articulations lies not only in examination of formal antecedents, but in an understanding of the motivations behind their use. They appear in the Senator's Palace at the Capitol complex, which is not dissimilar in scheme from the Villa d'Este, where according to van Moos, they reflect associations of the interdependence of the commune and the papacy during the
Middle Ages in their struggle against the overpowering presence of the nobility. The symbolism of the Capitol is also linked with *genius loci*; as the symbolic center of the city it has never ceased to be understood by Italians. The later use of the tower articulations in papal building campaigns was not intended to directly interface with well-defined political programs, but had more to do with the political advantage gained in stabilization of certain political institutions in their relationship to the public realm. Architecture was considered a mass medium in service of the Church and its ideology: political power was legitimized through an expression based on the traditional concept of the "fortified palace of the ruler".  

Consequently, the imagery of the fortress and its articulated corner towers as a means of legitimizing power had been carried into the Renaissance, where it was used by papal authority to gain the complicity of citizens through signification of the authority of the papal state. Yet in the meantime the authority of the papacy was undergoing challenge from the Reformation and the growth of nationalism. The notion of control of the landscape, beginning with the Cortile del Belvedere and achieving prevalence in the Italian garden paralleled the fragmentation of religious unity. Early notions of perspective and horizontal extension into space, also embodied in the Cortile, soon became the tools of the sovereign ruler: the Baroque image of authority became the palace at the end of the vista, epitomized by Versailles, paradoxical as it seemingly disappeared into the horizon, an image that unlike earlier images of authority lacked dominance or assertiveness from a distance. As if exhausted, the projects of the Early
Renaissance, beginning with Brunelleschi's Old Sacristry in San Lorenzo, were almost miniature in scale in comparison to the achievements of the Gothic builders. The tower had lost significance. But the early rationalization of the landscape that appeared in Renaissance garden design could not truly be appreciated unless viewed from a high place. Contemporaneous with the Villa d'Este was Palladio's Rotunda; unlike his previous villa designs it was not intended to be a villa at all, but a belvedere, it was built specifically for a hilltop view. Palladio designed it as if its chief function was to promote gazing at scenery. Although in this instance the view was not of a garden, but of patterns of husbandry, it was nevertheless controlled landscape. For such organization of space to be appreciated, it had to be viewed from a position that enabled the observer to visually encompass the rationalized vista. The belvedere was initiated, not a tower, but an architectural device that offered in its elevation over the landscape the tower-like advantage of appreciation of the newly significant view.
Born in 1760, by age eleven William Beckford was a millionaire. But despite the advantages of this kind of wealth, the Grand Tour, and friends among the cultured and influential, he somehow became isolated from the political and social career expected of him. As a young man he was carefree and irresponsible and eventually his "uncompromising and outrageously unconventional behavior" generated a public censure that forced him into a reclusive existence from which he only occasionally emerged. Left to his own resources as the only escape for his introvert mentality, he channeled his energies into intellectual activities and sharpened his skills as a collector of the old and the rare. This period of isolation had the fortunate aspect of becoming an occasion for a tremendous volume of literary production. His most influential contribution to the literature of his time was *Vathek*, a recognized successor to Walpole's *Otranto*.

Walpole's horrifying and romantic story, inspired by a dream, was set in an atmosphere of medieval chivalry and melodramatic superstition. Though it was superficial to the extreme, it became a spectacular success and had many imitators. *Vathek* possessed greater depth than many of the romances of the period, including Walpole's: though also dream-inspired it was autobiographical and therefore more substantive; the chief characters were easily identified with those who had exerted an early influence on Beckford's life.
Works such as these stirred the popular imagination of the time and were in themselves sufficient to explain the sudden desire for a romantic country villa, a dream Beckford himself engaged in. His goal was to create a domain over which he would have complete control, one that would challenge the greatest buildings of the time as a shrine of beauty and solitude. Considering his approach, it is hardly surprising that those who resented him were later to claim that all the voluptuous excesses of Vathek were being re-enacted behind the walls of Beckford's secluded guarded estate.

Beckford had been obsessed with heights and towers all his life. He described at age seventeen an imaginary tower that he would build to escape from "the land of men" into "an air uncontaminated with the breath of wretches, the objects of our contempt and detestation."² This account may be regarded as a preliminary attempt at defining the motives behind his hero Vathek's desires for building a tower of 11,000 stairs in order to look down upon "men not larger than pismires, mountains than shells and cities than beehives."³ On a visit to St. Peter's he imagined constructing a small tabernacle in the lantern of the dome so that he could survey the city whenever he felt inclined. His most cherished experience in Venice was a climb to the top elevation of St. Mark's campanile. He was enamoured of tower paintings and possessed a version of the Tower of Babel by the painter Valckenborsch.⁴

Upon the retraction by William Pitt, a boyhood friend, of a political mission originally entrusted him by the Regent of Portugal, Beckford was driven to a state of defiance and bravado. He decided that instead of a few
romantic ruins as he had considered originally, he would build a villa of enormous scale, style and magnificence, one that had never been seen before in England, and one that few people would ever see. Rather than drinking to unhappiness as some people did, he claimed instead he would build. This led him to commission the architect James Wyatt to design a conventional building attached to a gigantic tower.

Hundreds of workmen were employed at the construction site and the work proceeded without fanfare for the course of a year, with the exception of a few large feasts for all parties involved. Wyatt's drawings were placed on exhibition at the Royal Academy. Then, as an early spring gale tore at the cloth fastened to the tower, the entire structure crashed to the ground. Not to be deterred, Wyatt chose a new cement, supposedly known for its strength and durability and started a new tower. Beckford travelled to Portugal expecting to return to a completed villa at Fonthill where he could renounce the world by shutting himself in the towered structure forever but he was in fact surprised and filled with dismay by the lack of progress made during his absence. He galvanized Wyatt into action and construction continued with an unprecedented haste. It was perhaps for this reason that part of the tower collapsed a second time in a storm in 1800, forcing Wyatt to drop all of his other commitments and rebuild the tower in order to make it available to Beckford for the purpose of meeting prearranged social engagements. Despite these construction fiascos, Beckford managed to retain his initial excitement for the construction process, as indicated in his
description of the building site at night from an observation height of about ninety feet:

It's really stupendous, the spectacle here at night - the number of people at work, lit up by lads; the innumerable torches suspended everywhere, the immense and endless spaces, the gulph below; above, the gigantic spider's web of scaffolding - especially when, standing under the finished and numberless arches of the galleries, I listen to the reverberating voices in the stillness of the night, and see immense buckets of plaster and water ascending, as if they were drawn up from the bowels of a mine amid shouts from subterranean depths, oaths from Hell itself, and chanting from Pandemonium or the synagogue. 6

It was not until autumn of 1809 that the scaffolding encasing the tower was removed. In 1813 the eastern transept with its end turrets was completed, but the eastern wing was left unfinished due to Wyatt's sudden death in a coach accident.

The villa was approached by the three-quarters of a mile long Great Western Avenue. The trees that delineated the road were planted not in straight lines but in clumps of various kinds and numbers forming an impervious thicket carefully incised with a wide path. The towered villa loomed in the distance, set against a dark background of firs and oaks. As an arrangement it was carefully contrived, an exemplification in architectural form of a recollection from Uvedale Price's Essay:

All the characteristics beauties of the avenue, its column stillness, the religious awe it inspires, are greatly heightened by moon light. This I once very strongly experienced in approaching a venerable castle-like mansion.
sectill Abbey, built in the beginning of the 15th century; a few gleams had pierced the deep gloom of the avenue; a large massive tower at the end of it, seen through a long perspective, and half lit by the uncertain beams of the moon, had a grand mysterious effect. Suddenly a light appeared in the tower; then as suddenly its twinkling vanished... again more lights quickly shifted to different parts of the building and the whole scene most forcibly brought to my fancy the times of fairies and chivalry.

Fonthill Abbey was constructed of four vast extravagant wings radiating from a central octagonal tower 216 feet high. From the salon in the lower part of the tower, or the Octagon, galleries contained in the wings stretched for a total of over 300 feet in the north and south directions. The sleeping quarters of the completed building consisted of eighteen bedrooms located on the floors above the galleries and in several turrets including those clustered about the Octagon. The ground floor was primarily devoted to service rooms such as servant's quarters, the kitchen and sculleries. The Tower staircase rose adjacent to the Octagon wrapping around an enormous central column; those ascending would successively disappear and reappear until the landing was reached in a triforium type of gallery supported by slender columns called the Nunnery arcade. The stair-
case continued upwards and ended at a location level with the base of the lantern or the second stage of the tower where it was possible to make a circular ascent within the tower or an inclined plane, rising another 35 feet to the skeleton framing above the gallery of the highest portion of the tower. From this level the ascent was again by stairs to the Observatory where comfortable seating was available for repose, and higher to the windowed Tower Gallery. Therefore, the tower was intended not only to be viewed as an element of the landscape, but to function as a lofty observation platform from which the countryside could be surveyed.

At grade level, the Octagon was approached by a stair hall 120 feet high structured with heavy timber carved and painted to resemble old oak and faintly illuminated by stained glass windows producing a gloomy dream-like effect approaching the sublime. On evening gala occasions the notion of sublimity achieved greater power as shadowy hooded and gowned figures carrying hallway lighting drifted down the stairs and a distant note echoed from the galleries. On departure

... from this strange nocturnal scene of vast buildings and extensive forest, now rendered dimly and partially visible by the declining lights of lamps and torches, and the twinkling of a few scattered stars in a clouded sky, the company seemed, as soon as they had passed the sacred boundary of the great wall, as if waking from a dream, or just freed from the influence of some magic spell.

40. Fonthill Abbey, stair hall

The villa was originally conceived as an immense piece of scenery; the third dimension functioned primarily as a support to provide a sense of distant reality. Structural considerations were introduced only to bring the
concept from its first stage as a folly of timber and cement to its final one of masonry. As indicated in the absurdity of its internal arrangements, the plan was not considered an organic part of the whole. Compositionally, the Tower demanded either a long main structure or considerable height and substance in its adjacent parts. Both of these approaches were employed in a compromise solution where when viewed from any angle at grade level the plan arrangement appeared massive, however when seen from above the illusion of the thin cruciform shape was revealed.

For young artists and architects Fonthill became legendary; it was considered the highest achievement of the sublime. From the large flat rocky edge of a nearby lake quarried by Beckford, J.M.W. Turner and groups of contemporary artists would sketch and paint the villa in varying dramatic views. In fine weather the representations were ethereal and in stormy weather they were demonic, veering swiftly from one mood to another, seemingly like the mercurial villa creator. It almost appeared Fonthill was designed specifically for the purposes of this type of two-dimensional representation:

From amidst these the turrets, towers, and pinnacles of the Abbey are seen to rise, at once crowning the eminence, and presenting from different points of view, and under the ever changing effects of light and shade, a succession of beautiful and interesting pictures.

39. Fonthill Abbey, plan

English villas of this time, ideally exemplified by Fonthill Abbey were the first type of architecture to be designed in accordance with the new picturesque theory of aesthetics, an approach that unlike earlier
thought had little sympathy with the roots of classical antiquity. Although this approach embraced all of the arts its premises were based on literature and landscape painting. Joseph Addison first gave it popular expression in a series of articles entitled "Pleasures of the Imagination" published in The Spectator in 1712. He believed that these pleasures arose first from objects as we see them with our eyes and second from the thought of visible objects when they are not present. In this fusion between vision and the imagination or the objective and subjective he assumed that virtually anything could be beautiful because God had provided in everything about him the power of creating an agreeable impression in the imagination. Therefore

... our souls are constantly being delightfully lost and bewildered in a pleasing delusion and we walk about... like an enchanted hero in a romance, who sees beautiful and fantastic castles which, upon the breaking of some secret spell, will vanish. 11
He continues with a discussion on the aesthetic merits of ugliness, stating that even the imperfections of nature please.

The theory of aesthetics was defined by categorizing notions such as beauty, sublimity and the picturesque. The Vitruvian notion of beauty, though accepted by Addison, was rejected by later philosophers such as Burke who claimed in his Philosophical Enquiry into the Origins of our Ideas of the Sublime and Beautiful that proportion and utility had nothing to do with beauty, supporting his observation with references to various species of plants and animals. Most theorists agreed, however, that it was the notions of the sublime and the picturesque that possessed the most powerful aesthetic associations. Fonthill Abbey was considered the most striking architectural exploitation of the concept of sublimity.  

According to Burke, emotive qualities, confined to objects, were perceived by one of the five senses and instantaneously affected one of the two passions via the imagination. The two passions were self-preservation and self-propagation. Self preservation brought forth an awareness of fear, generating the emotive quality of the sublime. The attributes of the sublime were obscurity, power, privations, vastness, infinity, succession and uniformity. Obscurity was terror-inducing and was an effect of gloom, an attribute that could be easily related to architecture. Burke had quoted Milton's gloomy descriptions where "all is dark, uncertain, confused, terrible and sublime to the last degree."  

Gloom was also a characteristic quality of the Gothic novels of the time, as envisaged in Charlotte Smith's The Banished Man, where
... the immense hall of castle Vaudrecour was so obscure because of its great height, time blackened oak beams and its high narrow windows that it was with difficulty that the hero could make out the objects with which he was surrounded.

Obscurity was realized in the gloomy interior and the changing moods of the landscaped setting of Fonthill Abbey. The quality of vastness could create a striking architectural effect; Burke believed that height, an intrinsic attribute of the tower, represented the most powerful kind of vastness. For Ruskin in the "Lamp of Power", sublimity was inherent in greatness of scale:

While, therefore, it is not to be supposed that mere size will enable a mean design, yet every increase of magnitude will bestow upon it a certain degree of nobleness: so that it is well to determine at first, whether the building is to be markedly beautiful or markedly sublime; and if the latter, not to be withheld by respect to smaller parts from reaching largeness of scale; provided only, that it be evidently in the architect's power to reach at least that degree of magnitude which is the lowest at which sublimity begins, rudely definable as that which will make a living figure look less than life beside it.

The sublime quality of vastness of dimension created at Fonthill was difficult to obtain in lesser structures, so contemporary architects instead fell under the influence of the picturesque. Wyatt's creation was picturesque only to the extent that it was deliberately situated in a natural landscape and was built in the Gothic style, later established as the quintessence of the picturesque. But its scale was too grand and the disposition of its elements lacked the visual quality of randomness. For Hussey, the absence of this effect was a "result of Wyatt's blindness to picturesque architecture.
As Beckford grew older, Fontill ceased to be an adventure for him and he eventually put the estate on the market in 1822. Public excitement was elevated as visitors arrived from great distances to marvel at the secretive, mystical structure to which they never had access. It was sold by private treaty prior to the day designated for an auction to an eccentric gun power millionaire John Farquhar. Then, in 1825, when Beckford was on his deathbed, a contractor of Wyatt's confessed to him that he had not placed the foundations of the tower according to the specifications and that he was fearful the tower would fall at any instant. Hastily warning Farquhar, Beckford hoped the tower would at least stand for the remainder of his life. His optimism was shattered. Within that year, on December 21st at 3:00 P.M. the tower fell to its destruction, crushing one of the galleried wings and the Octagon and subsiding in the fountain courtyard.

The architectural significance of Fonthill Abbey was obscured during the period immediately following its disappearance by the seriousness and moral intensity of the subsequent Gothic Revival. Even prior to this moral approach the villa was considered by many a "meretricious piece of nonsense". According to Frankl the Gothic Revival entered its serious phase with the Houses of Parliament; everything preceding this time, including Walpole's Strawberry Hill and Fonthill Abbey had been "mere trifling and dilettantism". However, unlike his successors, Wyatt did not feel compelled to engage in the exact reproduction of a medieval building, but rather developed his own honest
successful adaptation. There being no recognized Gothic prototype for domestic architecture, many contemporary architects had only added occasional battlements and gothicized windows to the design of a house for a patron. But Wyatt turned to spiritual architecture not only for details, but also for scale and proportion: he imitated in Fonthill "the height, the towers, the vaults, and the scale of Cathedrals." 21

With the development of the aesthetic concept of the picturesque and sublimity as an attribute of the picturesque, the concept of great height once again achieved prominence. The revival of the Gothic style was opportune in this respect, it intrinsically possessed potentially picturesque characteristics and because of its association with qualities of vastness it was ideally suited for expression of the sublime. The Gothic expression was not approached the same way it had been by medieval builders, as a highly sophisticated method of building in its regard to technical detail, instead it became a set of forms and ornament borrowed from Gothic secular and cathedral architecture that relied on an association with the Gothic to visualize romantic principles. The approach towards the Gothic idiom in both contexts is elucidated by the attention given to perfection of technical aspects by cathedral architects and the lack thereof by romanticists. The tower at Strasbourg was the result of a patient search by builders for a technically viable structure. The tower at Fonthill was an allusion to that search, but an imitation that lacked the technical consideration found in the original. Its propensity to fall was not the fault of the constructors or the materials as much as it was intrinsic to the design. Structure was merely a prop for scenography. The tower was not the extension of a city, but isolated in the English landscape, it was the
center of an enchanting picture, where it called attention only to itself and of course, its owner. At this time it was the villa that influenced the theory of architecture more than any other building type, a result of the attention lavished upon it by influential patrons. Newly enriched merchants and industrialists adopted it as a favorite type and it became one of the most powerful mediums for expressing the aspirations of the era.

William Beckford's dream of a tower and his desire to possess his own observation platform for viewing the landscape, actually in this villa and garden relationship a lofty prominent belvedere, was transformed by means of a stage set to some semblance of reality. Though he claimed he sought privacy, erection of such an ostentatious structure was an expedient way to discourage seclusion. The private construction of a monumental tower may have been regarded as inappropriate, but because it was Gothic and it was an attractive element of a picturesque landscape, an essential component in two-dimensional representations, it became publicly acceptable and more: in its vastness, its sublimity and all of its artificiality it was the fulfillment of a romantic dream, not only for Beckford, but for Wyatt, artists, the public, the time.
Although a somewhat tumultuous and contradictory time in France, the late nineteenth century Belle Epoque was nevertheless as era where propitious economic conditions combined with a respect for old values to produce a spirit of confidence and optimism. The temporary euphoria generated by this period was partially a result of its contrast with recent French experiences of helplessness and military defeat. In the Franco-Prussian War the Imperial Army of Napoleon III had been defeated in a matter of weeks. France had lost the eastern provinces of Alsace and Lorraine, and along with them the economic advantages of their mines and industries. The Parisians themselves had suffered most: they were the victims of a five-month siege by German troops followed by civil strife where the city was divided with barricades, ravished with fire, and transformed into a tragic scene of bloody street fighting that left it in ruins and 20,000 Parisians dead. But in the course of a decade the city made an amazing recovery and the economy gained momentum: the national income doubled, industrial production tripled and foreign trade increased by 75 percent. France conquered a colonial empire in Indochina and North and Central Africa in the 1880's. Second only to Great Britain's in population and size, it provided a new expanded market for investment and industrial output. As the Republic became firmly established and gained economic momentum, the government looked forward to
commemorating the centennial of the French Revolution with a national industrial exhibition to be held in 1889. More than a commemoration, the centennial was to be an effort by France to recapture lost glory and to express a new industrial supremacy they believed they had lost early in the nineteenth century to the British.²

The revolution that was initiated in Britain in the late eighteenth century and guided by the liberating thought of the Enlightenment was not effected by politicians, but by engineers. As the new profession became established, monumental structures such as the Crystal Palace and the Brooklyn Bridge were created, their aesthetic based on the logic of mathematical equations. Works such as these had in common the use of iron, a metal that had always been valued for its hardness and strength, but had achieved a new potential in the face of changing material conditions. Builders were now able to take a new approach to structural design based on a reasoned economical use of material, rather than relying on the resolution of static forces with sheer mass. Chicago's Home Insurance Building, considered the first true skyscraper, was designed with concealed iron framing by William Le Baron Jenney, a Chicago architect who had graduated from the Ecole Centrale des Arts et Manufactures in Paris one year after his schoolmate, Gustave Eiffel. It was completed in 1885, four years prior to the Eiffel Tower. Hampered by governmental instability, plans for the exhibition did not begin to take shape until 1886, three years prior to the opening date. Edouard Lockroy, the new minister of commerce and industry, a graduate of the Ecole des Beaux-Arts, a journalist and
an author of several comedies and operettas, believed that the fair needed a "Babel-like symbol". He was enamoured of the idea of a 1000-foot tower and promoted it vigorously. The notion of a tower of this magnitude was not especially new. At the close of the eighteenth century architects had thought of height in terms of the sublime, as it was expressed in engravings of Wyatt's tower at Fonthill. Anne Radcliff had asked, "Why is it so sublime to stand at the foot of a dark tower and look up its height to the sky and the stars?" But to the Victorian era, height was to suggest a different idea: the new material conditions seemed to suggest an engineering feat for its own sake, a symbol of optimism and technical achievement, a tribute to the belief in scientific progress. The attitude of the nineteenth century builders was illuminated by Ruskin:

> Whenever men have become skilful architects there has been a tendency in them to build high; not in any religious feeling, but in mere exuberance of spirit and power as they dance or sing....

With this spirit, in the early part of the century designers set out to create a tower 1000 feet high. The chosen height was arbitrary but significant because it dwarfed towers of the past, for example the spires of Gothic cathedrals. Once the problem was established, architects and engineers worked at its resolution for almost sixty years until the final achievement of the Eiffel Tower.

The first project for the design of a 1000-foot tower was for the purposes of commemorating the passing of the Reform Bill in England, a measure that marked the end of laissez-faire and the beginning of an era of
enthusiastic reform. Richard Trevithick, an engineer eager to re-establish himself in England after his absence to investigate some Peruvian silver mines, was chosen as designer for the project. A lithograph of the project was published in 1832. A conical tower entirely of cast iron was proposed: the plan diameter was 100 feet at the base, tapered to 10 feet at the summit. A cylinder 10 feet in diameter at the center accommodated an innovative lift for persons ascending to the top. The gigantic column aroused the interest of the King, but two months later Trevithick died and with him interest in the project. The form of the tower, considered unusual at the time, and the political connotations it carried may have been partially why interest waned, but the chief factor was probably uncertainty of its structural feasibility. Trevithick's reference to a circular stone foundation six feet wide showed that the engineer was not fully aware of the implications of a 6000-ton gravity load or of the great over-
turning moment generated by wind on a 100-foot high tower. The project does indicate the spirit of the structural pioneers however: the vision of a glorious golden tower rising in smoke and mist-filled London to a height three times that of St. Paul's cathedral was a heroic one that could be achieved for the time only in the nineteenth century. 6

Nineteen years later, the Great Exhibition provided another opportunity for the expression of Victorian exuberance in the Crystal Palace. When the Exhibition closed, the question as to what would be the best method for disposing of the glass and iron building was seriously debated. The Builder magazine accepted proposals for the future of the structure. Among these was a 1000-foot tower proposed by the architect C. Burton made from iron and glass salvaged from the exhibition
building. The tower actually consisted of a series of towers telescoped within one another; each tower functioned independently structurally, its iron framework directly transferred loads to the foundations. The tower was to support a clock 44 feet in diameter, 440 feet above the ground. Burton emphasized the view from the top of the tower: one would be able to survey the countryside for one hundred miles around London without the risk involved in a balloon ascent. 7

In the 1970's when the United States was preparing to celebrate its first century of independence, young designers became preoccupied with the idea of a monument to signify the achievements of the young republic. One of the most spectacular designs was submitted by Clarke and Reeves who, just as Trevithick and Burton before them, presented a proposal for a tower 1000 feet high. The cylindrical structure was 150 feet in diameter at the base and 30 feet in diameter at the top. A spiral staircase wound around a central cylindrical shaft containing four elevators that had the capacity to ascend to the top of the tower in three minutes and descend in five minutes, transporting 500 passengers per hour. Extremely conscious of the problem of wind-loading, the designers reduced the load-bearing surface of the tower to a minimum through the use of the proprietary Phoenix Column, a hollow tube section made up of segmental sections bolted through projecting flanges, and with diagonal bracing made of iron tubes of a smaller section. Intended for a site adjoining the Centennial Exposition in Philadelphia in 1876, it was proposed that the Exposition be brilliantly illuminated at night by calcium and electric lights from the tower. Enthusiasm for the tower was expressed in an article in Scientific American:
Clark and Reeves, design for a 1000-foot tower

... to its prototype, Babel, a pile of sundried clay... the graceful shaft of metal, rearing its summit a thousand feet above the ground, forms a fitting contrast, typical of the knowledge and skill which intervening ages have taught mankind. 8

Unlike the previous designs for a 1000-foot high tower, the Philadelphia tower displayed a complete disregard for contemporary architectural theory. Even Trevithick's tower alluded to a classical column with its divisions of base, shaft, and capital. Clarke and Reeves were concerned only with structure and its direct, logical expression. 9

By the time of the centennial of the French Revolution, Eiffel had already produced such displays of structural daring as the Garabit viaduct, where he had evolved his own workable formula for wrought-iron construction.
He had developed a design for high support towers in which the tower widths spayed at their bases to resist wind and had experimented with new metal forms made of factory produced pieces. By significantly reducing trusswork without sacrificing strength and rigidity he was able to create sturdy, light, and most importantly, wind-resistant structures. Additionally he had developed novel erection procedures, such as his method for "launching" the deck of a bridge using a system of rollers and rockers that evenly supported the bridge deck as it was thrust forward over a chasm to meet the next pier. Eiffel's preference for wrought iron, his careful attention to bracing the structure against the wind and his development of new erection methods were found in evolved form in his design for a 1000-foot tower, his final and greatest metal construction.

Eiffel's suggestion for the exhibition tower was enthusiastically endorsed by the French government and a special commission was formed to examine the technical feasibility of the project. At the time a competition was established and other designs were submitted; however at a second meeting the commission announced that the Exhibition tower should be a masterpiece of the metallic industry and furthermore, Eiffel's tower appeared to be the only entry that fulfilled this condition. The competition criteria had actually been designed specifically with Eiffel's project in mind. It had been on paper since 1884 when it was outlined in a French civil engineering review. Shortly afterwards Eiffel had called on Lockroy, presenting the idea of the tower as a centerpiece for the Exposition of 1889. He emphasized that stone had already been pushed to the limit of its technology in previous eras and
that new ambitions called for new materials and techniques previously unavailable. At the time the world's tallest structure was the 555 foot high Washington monument, only 43 feet higher than the spire of the Cathedral of Cologne.  

Over 100 projects were submitted for the competition. Among the rejected ideas were: a tower in the form of a gigantic sprinkler to water Paris in case of drought; an immense guillotine symbolizing the Revolution; a tower with a powerful electric light at its summit surrounded with a system of parabolic mirrors that reflected light towards the most remote quarters of the city; and the "Tour Soleil", crowned at the top with a 180-foot allegorical statue representing science, and containing six levels with fifteen rooms each for "aerotherapy" treatments, a multistory basement museum dedicated to electricity and a hollow center shaft to accommodate scientific experiments involving falling objects.

The ground breaking for the Eiffel Tower took place in January, 1887. Within five months the workers had completed the masonry and iron foundations that rested on a layer of sand and gravel over a deep stratum of clay. Hydraulic presses were added at the angles of the piers to enable manipulation of the structure and insertion of iron wedges between the pier and foundation, accommodating any settlement that would occur when the full load of the tower was applied. When the four angled legs reached 100 feet, scaffolding was necessary to carry their construction to a height of 169 feet where they were to be joined by the horizontal beams that formed the first platform. Prior to constructing the platform, as if adjusting a gigantic
precision instrument, Eiffel brought the sixteen columns of the four piers into line while correcting their position through the manipulation of the hydraulic presses. The first platform was completed in April, 1888. Within three months the second platform was constructed at 250 feet. At this point in the building process there were some feelings of doubt on the part of Parisians generated by a Professor of Mathematics who claimed that the Tower was at a height that was its theoretical maximum and if taken any higher it would collapse. But such theoretical propositions did not slow construction. As the Tower reached about two thirds of its completed height, dissatisfaction among the workers grew: the work had been arduous, a source of discomfort, and threatened with danger. Besides the ever present fear of falling, although vertigo was virtually eliminated through the construction of opaque wooden platforms, the hazards of outdoor construction work, magnified by the open design of the tower were a constant source of frustration as workers' hands froze to metal and rivets cooled before they could be driven. Despite strikes, bargaining, and replacement of workers, construction progressed nearly on schedule. Throughout the fabrication process, pieces of iron were raised by four cranes attached to tracks within each pier that were to be later used by the Tower's elevators. As the cranes made the climb towards the top of the Tower during progressive stages of completion of the structure, they periodically jumped up their tracks from an inclined position in the lower part of the Tower to a vertical position formed by the central elevator guide in the upper portion of the Tower. Despite the lack of elevators, their late arrival resulting from conflict between
Eiffel and the elevator companies over issues of aesthetics and safety, the official inauguration of the Tower took place one day after construction completion on March 31, 1889 when Eiffel himself climbed the tower and unfurled the French tricolor on an iron mast.

The outline of the Tower was designed to resist the wind according to Eiffel's structural philosophy that the essential lines of a building should be suited to its purpose. Built of iron because Eiffel did not trust steel, it has a high strength to weight ratio and was therefore extremely light. However, it did present a relatively large surface to wind at great heights and for this reason its vertical dead load was very small in comparison to the horizontal wind load. Consequently, the Tower was designed parabolically with a wide base, as a very efficient cantilever. Viewed as a unified fabricated form, the whole Tower was an adaptation of "the lofty supports of iron bridges increased to cosmic dimensions." Its daring presence not only results from its height but also from its wilderness origin; not inspired by the architectural conventions of the time, its aesthetic instead originated in railroad supports which Eiffel himself had constructed in regions remote from the Parisian landscape.

The Tower rises in three stages to its full height. Its four great piers embrace an immense internal space as they asymptotically meet at the summit. The arches that connect the four supports are purely decorative; though reminiscent of Eiffel's original intention of supporting the tower on gigantic bridge arches, they
carry no load at all, perhaps a gesture on Eiffel's part to a public who would feel more convinced of the stability of a structure seemingly supported by a conventional arched form rather than one resting only on curved pylons. Elevators rise along the east and west piers to the first platform, along the north and south piers to the second platform with one elevator stopping at an intermediate point, and from the second platform a double elevator ascends the center of the Tower to the third platform. Considering the elegance and economy of the structure, the system of internal transportation appears cumbersome. However, the most straightforward solution would necessitate elevators rising from the ground vertically through the center of the Tower disrupting the simplicity and clarity of the structural expression.  

Most of the interior construction that was separate from the iron structure was placed on the first level of the Tower where a majority of the visitors were expected to stop. The platform was open in the middle creating a rectangular promenade 930 feet long and nine feet wide sheltered by iron arcades. Here the public could partake in a panoramic view while leisurely walking, shopping, or eating in one of four restaurants. The second level contained an editorial room with a printing press for producing a daily Exposition guide, a bar and a pastry shop. From the glass enclosed octagonal third platform, a spiral staircase led to an upper level apartment with adjacent labs for Eiffel's scientific experiments. On a balcony surrounding the platform tracks were placed to carry two high-powered spotlights that could be focused on
different monuments in the city within a seven mile range for the pleasure of the observers in the Tower. A beacon was placed at the summit with a range of 120 miles, visible from Chartes cathedral. Painted in a reddish brown color called Barbados Bronze, the structure was deep-toned on the lower piers and progressively lightened until it was almost pale yellow at the top, accentuating its appearance of loftiness.

Although the Tower presents the single, unified image of an open metal cantilever, the strength of this expression depends on the synthesis of almost an infinite number of standardized iron components. The intricacy of construction detail reflects the economic conditions of nineteenth century France where field labor was less costly than shop metal. The height of the tower infuses it with a monumentality that is contradicted in its transparency. Its outer and inner spaces are interpenetrating to an extent that goes beyond Gothic achievements in stone, such as the cathedral spire at Strasbourg. Internal descent
through the open cantilever provides not only views of the distant complexity of the Parisian cityscape, but close up intimate views of the riveted detail in the structure of the tower, an internal park-like setting that competes with the external vistas. This juxtaposition led Sigfried Giedion to observe the way the "soaring lines of structure intersect with trees, houses, churches and the serpentine windings of the Seine" and that the "interpenetration of continuously changing view points creates, in the eyes of the moving spectator, a glimpse into a four-dimensional experience." However, this interpretation of the tower was not truly revealed until two decades after its completion when "an optical revolution shattered the static view point of the Renaissance." Giedion believed that the essence of space as conceived by modernists was its many-sidedness and that the discovery of the "fourth dimension", or space-time, enabled one to see the world in a new way. The notion of the fourth dimension enabled such artists as cubist painter Robert Delaunay to depict his surroundings from a new viewpoint. Haunted by the Tower, his visions of it corresponded to his own artistic development. No artistic formula could express the multifaceted spatial character of the Tower, so he searched beyond the laws of realism and perspective to develop his own interpretation, embracing its many dimensions.

Believing they had been surpassed by the British in the early nineteenth century, France hoped to demonstrate its new economic and industrial vigor through the exhibition. Eiffel believed the Tower would "show the world that France continues to be at the forefront in the art of metal structures." It was perhaps
partially the competitive spirit that existed between the two countries that led financial speculators in London, under the title of the Tower Company Limited, to sponsor a competition for a 1200-foot high Tower for London. According to the prospectus:

The Eiffel Tower has already rendered valuable service to science, besides affording special opportunities for observation and research, which, owing to its altitudes are not otherwise attainable. Taking into consideration the enormous popularity of the Eiffel Tower and the consequent pecuniary benefits conferred on those interested in that undertaking, it is not too much to anticipate that, in the course of a short time, every country will possess its tall Tower.
It is proposed that the Tower shall be much more spacious and of greater altitude than the Eiffel Tower.... Special facilities for pleasure seekers will be provide, such as Restaurants, Theatre, Shops, Turkish Baths, Promenades, Winter Gardens, and a variety of other amusements, which will not only afford healthful recreation for the millions, but it is anticipated, will ensure a profitable return for the shareholders...

The conditions of the competition were simple and brief. The only important stipulations were that steel was the preferred material, that elevators must be provided, and that the designs were to be accompanied with construction estimates. The sixty-eight designs submitted ranged from orthodox designs resembling Eiffel's Tower to more eccentric approaches that exaggerated a particular stylistic tendency or utilized
period motifs at a gigantic scale. The jury emphasized practicability and construction cost over the potential structural brilliance of some of the unconventional designs and gave prizes to two designs that resembled the Eiffel Tower. Construction on the tower actually began in Wembly Park, near London in June 1893, but seven months later when the structure reached the level of the Eiffel Tower's first platform, the project was halted temporarily and eventually abandoned. As a group the designs displayed an adventurous spirit free of inhibition. Unlike Eiffel's approach where the aesthetics of the tower were primarily the result of scientific analysis, the English towers were based on a preconceived notion of what the tower should look like: engineering was only considered a means by which an exotic design could be made to stand. 21

Before the construction of the Eiffel Tower began, a number of people became angry with the proposed project. The technical feasibility of the Tower was beyond the understanding of most Parisians, but its potential effect on the skyline was not, especially for the group of artists and writers who made their famous public protest:

We writers, painters, sculptors and architects, fervent lovers of the beauties of Paris, hitherto unblemished, protest with all our might in the name of slighted French taste against the erection, in the height of our capital, of the useless and monstrous Eiffel Tower, which public ill-feeling, often inspired by good sense and the spirit of justice, has already christened the Tower of Babel. Shall the city of Paris associate itself with the grotesque, the commercial fantasies of a building (or a builder) of machines, to dishonour itself and disfigure itself irredeemably? For the Eiffel Tower, which not even trade-
conscious America would wish to call its own, is the dishonour of Paris, do not doubt it.... 22

However when the Tower was completed many, though certainly not all, of the initially adverse opinions were transformed into favorable, accommodating views.

Shortly after its construction, Eiffel utilized the Tower as a laboratory for several kinds of experiments. His uncertainty of the future of the Tower, knowing that his 20-year lease would eventually expire, led him to establish more firmly its utilitarian role. He installed weather equipment on the third platform. Physiological tests were conducted on the top of the Tower to determine the effects of altitude on the human organism. Interested in experimentation and research in aviation, Eiffel conducted drop tests from the top of the Tower and built a wind tunnel at its base. He also knew that the Tower was a natural communications post and encouraged experiments in transmission.

The Tower survived Hitler's threat to reduce it to a pile of ruins along with other Parisian monuments during the second World War; afterwards it returned to its original status as the leading tourist site in Paris and one of the most visited monuments in the world. In 1925, the Tower was converted into one of the largest advertising displays ever constructed when André Citroën rented space on it to advertise his automobiles. The Citroën logo and animated figures lit up the sky in five-second flashes until 1936 when the sign was removed. The Tower has at times been a "lightning rod" for a variety of erratic human impulses.
in 1909 Comte de Lambert flew over the top of the Tower in a biplane, many have climbed the Tower as if it were an iron mountain, and as one might expect, it has been the site of numerous death leaps.

Prior to the construction of the 1046-foot Crysler Building in New York in 1929, followed by the construction of the 1250-foot Empire State Building two years later, the Eiffel Tower was the tallest man-made tower in the world. Since that time commercial structures over 1000 feet high have become more common. In Paris, where a new vertical element on the skyline provoked intense debate a century ago, it is now being encroached upon by a series of dull utilitarian high-rise structures. But the Eiffel Tower remains the tallest tower not built for a specific commercial or practical purpose. Attempts to capture the powerful imagery of the Tower have materialized in the form of a design for a 2060-foot steel tower for the World's Fair in Chicago in 1932 that was never realized, in the St. Louis Gateway Arch and in replicas such as the 340-foot tower built in King's Mill, Ohio as part of an amusement park in 1972. Replicas are sold at a miniature scale, accessible and touchable for everyone in the form of tower trinkets. The desire for a relic or replica of the Eiffel Tower has reached the proportions of fetishism. In several instances, people have requested dimensions of the Tower specifically for the purpose of personally reproducing it by any available means at hand. 23

In a recent examination of the Tower at a vantage point removed in time from the initial study and interpretation of it by early artists, careful observers
such as Roland Barthes have discovered it to be a rich source of meaning that has accrued with time.
Barthes believes the Tower has attracted meaning because of its omnipresence:

... wherever you are in the landscape of roofs domes or branches separating you from it, the Tower is there; incorporated into daily life until you can no longer grant it any specific attribute, determined merely to persist, like a rock or the river, it is as literal as a phenomenon of nature whose meaning can be questioned to infinity but whose existence is incontestable. There is virtually no Parisian glance it fails to touch at some time of day.... This radiant position in the order of perception gives it a prodigious propensity to meaning: the Tower attracts meaning, the way a lightning rod attracts thunderbolts; for all lovers of signification, it plays a glamorous part, that of a pure signifier, i.e., of a form in which men unceasingly put meaning... 24

To have achieved this level of importance for humanity, it always must be more than the Eiffel Tower. And though it seems paradoxical, it must additionally lack a function:

... the Tower must escape reason. The first condition of this victorious flight is that the Tower must be an utterly useless monument.... Gustave Eiffel, in his own defense of his project in reply to the Artists' Petition, scrupulously lists all the future uses of the Tower: they are all, as we might expect of an engineer, scientific uses: aerodynamic measurements, studies of the resistance of substances, physiology of the climber, radio-electric research, problems of telecommunication,
meterological observations, etc. These are doubtless incontestable, but they seem quite ridiculous alongside the overwhelming myth of the Tower....

For Barthes, architecture is always a combination of dream and function. Nineteenth century builders dreamed of structures of an astonishing height, much in the same way the earliest builders had:

Hence we might speak, among men, of a true Babel complex: Babel was supposed to serve to communicate with God, and yet Babel is a dream which touches much greater depths than that of a theological project; and just as this great ascensional dream, released from its utilitarian prop, is finally what remains in the countless Babels represented by the painters, as if the function of art were to reveal the profound uselessness of objects, just so the Tower...

Yet this "empty monument" receives more visitors than any other location in Paris. It is a world in itself, an object to be explored, to be possessed.

... the Tower ultimately reunites with the essential function of all major human sites, autarchy; the Tower can live on itself: one can dream there, eat there, observe there, understand there, marvel there, shop there, as on an ocean liner (another mythic object that sets children dreaming), one can feel oneself cut off from the world and yet owner of a world.

The Eiffel Tower represented a momentous transition in the concept of the tower as understood in its aggregation of past representations. Presented as a material of newly discovered potential, iron was now fabricated in an innumerable set of pieces to be bolted and
connected. The elevator found one of its earliest and most widely recognized installations. Actually an assembly process, the construction procedure was unprecedented in its speed, yet raised unparalleled problems for workers, primarily resulting from new conditions created by exceptional height. The openness and transparency of the Tower anticipated concepts of spatial perception to be fully realized, discussed and debated by modernists. In its synthesis of a combination of such major developments, the Tower was truly unconventional, of which Eiffel was not unaware; delicate art nouveau decoration and broad arches at the base gave an appearance of refinement and "stability" to the structure that facilitated public acceptance. In their awareness of history, in their recognition of their own technical accomplishments and of the difference of their age from any other, through their arbitrary goal of designing a 1000-foot tower, nineteenth century engineers were in some respects competing with the past in their search for an expression, an achievement of their own. The French challenged the rest of the world, especially England, who in their attempt to outvie their rival almost constructed a second Eiffel Tower. However in Paris the tower has no competition, it unquestionably dominates the city, as no tower has ever dominated a city. Paris cannot be disengaged from the Tower, the association is a fixed one that has become increasingly intimate with time. Initially regarded as an exotic object grafted on the Parisian landscape, it became a cynosure for technology as well as for the city. In our present look towards the past, it has yet to free itself from associations with its creation, but it has also accumulated a wide range of additional meanings; its susceptibility to
such varied interpretation, as Barthes indicates, lies in its absolute "uselessness" as a monument, though over the range of time it has been utilized in a number of ways, simply because it exists and because it is so obvious in its presence. It is high and it is located in the center of Paris, a combination that helped it become a popular tourist attraction. The belvedere had never been so spectacular. The chaotic landscape, the city, had never been enjoyed by so many, had never been embraced in one sweeping, all-encompassing view. A climbable structure, touchable, it was the machine, confiscated from its display stand in the exhibition, externalized, blown to a gigantic scale, yet affable, urbane. Constructed as a symbol of nineteenth century transcendentalism and optimism, in the spirit of scientific achievement, the anticipation of a better world, it gloriously wore these ideals on the face of the Parisian landscape. But today such ideals are history; the tower has not become completely disassociated with them, but rather, as Barthes elucidates, has now become an empty receptacle into which we place a variety of meanings; their hierarchy varies with its interpretations among individuals from near or far, from the past or the present. Any certitude of its meaning lies simply in its continuity as a powerful image across an entire range of assumptions, interpretations, speculations. It is this attribute of adaptability that gives it the potential to come closer than many towers in representing the idealized conception of "tower".
Prior to the fire that almost completely destroyed the city in 1871, Chicago was already a town of 300,000 inhabitants that was rapidly becoming a metropolis, a growth process facilitated by its nodal position in the emerging railroad network and the agricultural regions of the Midwest. It was a place without a deep history, a well travelled crossroads for people and goods, and a center for processing agricultural produce from Midwestern farms prior to its shipment to the populous East. After the fire, rebuilding was slow at first because of fear of further disasters, but construction was intense in the last two decades of the nineteenth century and what had been a village atmosphere was suddenly transformed into a modern business community with offices, warehouses, shops and hotels. Corporate enterprise as it is known today had been initiated and was rapidly expanding. To meet new needs generated by accelerated business growth, innovative building approaches were tested with an unusual boldness.

The new building methods grew out of specific technical developments. William LeBaron Jenney perfected the steel skeleton in his Home Insurance Building in 1885. For the first time, the metal framing supported all the building loads, including the outer masonry walls, demonstrating that it was possible to increase building height without placing an excessive load on the lower piers while also providing a less enclosed floor plan and larger expanses of glass, improving
interior illumination. In 1872, F. Baumann began suggesting new systems of piers to support concentrated building loads and he gradually developed and perfected them until he achieved the resulting "Chicago caisson" in 1894. The first safe steam lift was installed by E.G. Otis in New York in 1857 and appeared in Chicago in 1864. The hydraulic lift was developed by 1870, followed in 1887 by the electric lift. Innovations such as these, in addition to the widespread use of the telephone, made possible the agglomeration of office spaces in almost any quantity desired. The understanding of these technical developments on the part of architects, along with the absence of the restricting tradition of eastern cities, the lack of any pre-existing physical setting resulting from the fire and most importantly, the advanced degree of economic development, all contributed to the favorable climate for innovation that existed in Chicago in the 1880's.

The great increase in the height of Chicago buildings was primarily achieved in office buildings though these buildings often incorporated other commercial and even institutional uses. In this development, the new building technologies actually played a lesser role in relationship to the paramount factor of economics. Office space became a commodity to be sold at a profit. Technological experimentation was actually financed by business. According to Louis Sullivan, it was the local sales managers of Eastern rollings mills who were in reality responsible for the concept of the steel frame. The activity generated by the construction of the tall masonry load-bearing structures attracted their attention and from this point on the development of the frame was a matter of skillful salesmanship of
an engineered product. Height also had the economic advantage of prestige value for the business firm. It was useful in public relations: through advertising the name of the company it inspired confidence in its product, virtue was automatically attributed to the organization that owned a lofty building and, in general, height symbolized position, power and prosperity.

The Reliance Building is probably Chicago's finest skyscraper. According to Giedion the "experience of the Chicago school is summed up in this glass tower." It was originally built by Burnham and Root in 1890 as a five-story building and later, in 1895, after Root's death, an architect on Burnham's staff, Charles B. Atwood, and the engineer E.C. Shankland added an additional ten floors identical to the floors constructed initially. The upper steel frame was erected in fifteen days. It was innovative in its inclusion of two unusual provisions for windbracing: first, the 24 inch deep spandrel girders with either solid or trussed webs were bolted through their entire web depth to the columns forming a rigid connection; second, the two-story length columns were vertically staggered in their relationship to one another increasing lateral stability. The exterior envelope, a vertical succession of dark bands of glass divided into large panes with slender mullions, transparently wraps the internal piers and columns. Reflected in the horizontality of the spandrel panels, the floor system of the interior is supported by a framing system of steel girders and joists that transfer the loads to the columns. In the lack of expression on the facade of the underlying structure and in the simplicity
and clarity of its surface, Atwood came very close to succeeding in the development of the modern curtain wall. The skin achieves its lightweight dematerialized appearance not only from the extremely high proportion of glass, but also from the careful detailing that places the glass contiguously in the same plane with the white terra cotta spandrels. The windows are one of the most significant features of the building because they represent the highest development of the "Chicago window", or the placement of a pane of glass so that it fills an entire structural bay with the exception of smaller adjacent panes to each side containing a narrow operable sash. The bow window had originally appeared in early Chicago buildings as a separate component that lacked integration in the overall design scheme, but here it was made an integral part of the building skin. In its continuity with other windows of its type it formed an undulating facade. Rather than a heavy overbearing cornice, the roof is a thin projecting slab that suits the character of the delicate transparency of the facade. In its lightness, airiness, in the purity of its proportions and in its cogent declaration of structural utility as art, more than other nineteenth century building the Reliance Building anticipated the development of the twentieth century modern office building.

For Leonardo Benevelo, the importance of the Reliance Building to the observer of modern architecture can be explained by the construction process that led to the surprisingly cohesive tower expression. The later hasty addition of the upper ten floors indicates that the building was not designed as a whole, but as a multiplication of units. The simple motif consisting of decorative strips of
glazed white tiles and glass was simply repeated thirteen times above the two level base. He believes that this process provides convincing evidence of the cultural conflict underlying the experiments of the Chicago school. The architects of Chicago were aware of the potential for the development of a new building type and wanted to master it architecturally, however they only had the limited means available in their local culture to achieve such an aim. The results we find so important today, exemplified in the Reliance Building, were obtained just at the time when the concern for the intricacies of composition was undermined in the face of urgency.  

Montgomery Schuyler, a New York journalist and architectural critic, began writing a series of articles after a visit to Chicago in the early 1890's that have been grouped under the heading, "Skyscrapers: Rationalistic Architecture." He later became known as "one of the most devoted apologists of the Chicago school."  

His evaluation of the Reliance Building was presented in an essay on D.H. Burnham:

Its most obvious peculiarity is that the protecting envelope is of glazed white terra cotta. Practically this is a very eligible material in the atmosphere of Chicago but the employment of it throughout seems almost like the frank abandonment of architecture, as much as the omission of an attempt to "do something" with the cage.... The covering is confessedly a covering and does not in the least simulate a structure nor dissemble the real structure.... If he says, as he seems to say, that this is the actual skyscraper, the thing itself, and that any attempt to do more than he has done is to deny the essential conditions of the problem, it must be owned that he has a good deal to say for himself.... But on the
other hand, it must be owned that if this is the most and best that can be done with the sky-scraper, the sky-scraper is architecturally intractable...

Schuyler's criticism weighted architecture in reference to the milieu in which it was formed: if the conditions were not ideal, the architectural expression was not expected to be. In this respect, the skyscraper for him would never achieve its ideal expression, it would remain only an ambivalent one in its compromise with the overriding concerns:

Modern commercial architecture in general, when it is done by artistic designers, is such a compromise. It bears the scars of conflict, if not between the architect and client, between the claims of utility and of art or I should prefer to say between the facts of the case and the notions of the architect.

However, Schuyler assumed that it was only conditions such as those that existed in Chicago that had the potency to produce a new architecture, if only successful in the sense that it was innovative:

And, indeed, it would be worse than idle to find fault with the conditions because, as we have seen the successes have been won by an absolute loyalty to the conditions, and by the frank abandonment of every architectural convention that comes in conflict with them.

The development of the frame and its architectural expression in the division of spaces, an outgrowth of the economic demand for it and the technical capabilities to produce it, facilitated the creation of a vertical expression that would represent the most
dramatic break with towers of the past. The Eiffel Tower had presented the potential to achieve unprecedented heights through the raw utilization of a new technology, but with the exception of its relatively few commercial amusements, it was a structure containing three platforms only, essentially a bridge stood up on end. But in Chicago the new construction technology was promoted and developed not by a single innovator eager to prove the results calculated in a carefully engineered design, but by the new demands generated by the embryonic existence of corporate enterprise. For Frank Lloyd Wright the coincident requirements of enterprise and the availability of a mechanical means to meet them were inseparable aspects of the same social mechanism; the commercial field was "naturally ripened first by the machine. The tall office building is the machine pure and simple."¹² According to Colin Rowe, the architects simply accepted the conditions imposed by the speculator and worked with them; the office tower was no more than the rational result of investment. The characteristics of the Chicago context readily became apparent in the ubiquitous expression of the frame, the chief constituent office tower element that later was to become its strongest symbolic attribute. For Rowe, the frame possessed a value for modern architecture not unlike that which the column held for classical antiquity. ¹³ By establishing a common ratio throughout the building to which all parts were related, it generated a system of its own to which all components were to become subordinated.

Louis Sullivan was determined to evolve a personal style of architecture within the Chicago context and through drawings and theoretical writings delineated
his approach. He was aware of the social, technical and economic milieu out of which the Chicago architecture grew:

Architecture is not just an art to be exercised with a greater or lesser degree of success. It is a social manifestation. If we want to know why certain things are as they are, in our architecture, we must look to the people; for our buildings as a whole are an image of a people as a whole, although specifically they are the individual image of those whom, as a class, the public has delegated and entrusted its power to build. Therefore, by this light, the critical study of our architecture becomes, not a study of art... but in reality a study of the social conditions producing it.... 14

He was critical of the contradictions involved in the production of architecture in Chicago, but believed that given suitable consideration they could be overcome: the tall office building only presented another contemporary problem that demanded a timely vital solution. 15 Inspired by the integrity of Henry Hobson Richardson's work which was "perfectly graded and finished according to classical canons", Sullivan sought to apply these compositional principles in his formulation of a skyscraper aesthetic. 16 He realized that the essential feature of the skyscraper was its numerous identical floors that obviously could not be differentiated without interrupting structural continuity. He therefore treated this potentially overwhelming portion of the tower as a single major component of the whole, contrasting and emphasizing its dominating verticality with the horizontality of the base and the attic story. These three components were each designed in relationship to the essence of the
tower in its totality. In the central and greatest part of the composition the office stories were "piled tier on tier, one tier just like another, one office just like all other offices—the office being similar to a cell in a honeycomb, merely a compartment, nothing more." 17 Based on a room containing adequate floor space and height, the office cell predetermined the standard structural unit. Seeing beyond the simple abstraction of the frame or cage, Sullivan had realized that the most dramatic change in the conception of the tower occurred in the three-dimensional compartmentalization of inhabited space. However, he accepted the creation of office space as a necessary response to new demands and went on to discuss the aesthetic merits of his method of resolving the problem:

we must now heed the imperious voice of emotion. It demands of us: what is the chief characteristic of the tall office building? And at once we answer; it is lofty. This loftiness is to the artistic nature its thrilling aspect. It is the very open organ-tone in its appeal. It must in turn be the dominant chord in his expression of it, the true excitant of his imagination. It must be tall.... It must be every inch a proud and soaring thing, rising in sheer exultation....

In a later response to this declaration, Mumford asserted that socially, skyscrapers encouraged all the characteristic American weaknesses, such as the love for "abstract magnitude," the interest in "land-gambling" and the desire for "conspicuous waste." Though these deficiencies did not lessen the inventiveness of the architects of the Chicago school, Mumford believed that
more than anything the mischief lay
in the notion on the foundation of
practical needs the skyscraper could or
should be translated into a proud and
soaring thing. This was giving the sky-
scraper a spiritual function to perform:
whereas, 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." 20

In addition to the frame, or structural system, and
the materials necessary to produce it, according to J.
Carson Webster the elevator is the one additional
essential element required for the development of the
skyscraper. As the compartmentalization of space
drastically modified the appearance of the tower, so
did rapid access to offices in the sky by elevator
contribute to a new way of perceptually experiencing
the tower, especially on the part of transitory inhabi-
tants. For Webster, the elevators are necessary for
the office tower to be built, "human demands being
what they are." 21 However the philosopher Gaston
Bachelard in contemplating more than their functional
meaning focuses instead on the spatial experience of
climbing in an idealized tower where "the dreamer
succeeds in getting out of the depths of the earth
and begins his adventures in the heights." 26 He
offers an explanation for the changed spatial experi-
ence in the present day office tower:

From the street to the roof, the rooms pile
up one on top of the other, while the tent
of the horizonless sky encloses the entire
city. But the height of city buildings is
a purely exterior one. Elevators do away
with the heroism of stair climbing so there is no longer any virtue in living up near the sky. 23

Webster believes that the essence of the skyscraper is that it combines ordinary spaces such as those often found in low structures with an extraordinarily tall form. We are not unaccustomed to seeing such great height in steeples, civic monuments, or observation towers, but it is rather surprising, although we have come to accept the economic motivation, that an office building should need to be high, or that we should feel the necessity to scale the heavens providing an extravagant means of access to activities that can be accomplished just as effectively at grade level. For Mumford the elevator was one of the most dubious characteristics of the tall building. He questioned the economy of vertical transportation at "the maximum rate of nine miles per hour" and the waste of the internal volume of the building in the unused portions of the elevator shafts. 24

Sigfried Giedion considered the Chicago school and in particular the Reliance Building one of the chief architectural developments in the progression of events leading to the ultimate expression of the modern office building. Referring to it as the "swan song" of the Chicago school, he claimed that

... in a broader sense, it might perhaps be said to have grown out of the Chicago soil itself, to be a reflection of the high architectural level that has been reached in that city... its airiness and pure proportions make it a symbol of the spirit of the Chicago school... Mies van der Rohe's scheme for a skyscraper of
glass and iron is the dream of a European architect in the year 1921. The points of departure for dream projects of this sort should perhaps be sought in works like the Reliance Building of some three decades earlier. But it may be that this Chicago building is something more than an incentive for fantasy: an architectonic anticipation of the future. 25

Colin Rowe was later to clarify the differences between the Reliance Building and Mies' project, stating that understanding these differences need not involve any great exercise of critical acuity. Actually the approaches taken by the designers of the two structures appear to be diametrically opposed: one is an abstract solution to a general problem, an idealistic projection, a utopia highly charged with symbolic significance; the other is designed specifically to meet existing requirements, a direct response to a technical and functional problem. One evidences complicity and the other protestation. For Mies the tower was a symbol of a technologically oriented future society; in Europe the skyscraper could take on the characteristics of this sort of dream, a status it couldn't achieve in America, in the face of the much too apparent economic reality. 26 But in Mies' "Working Theses" of 1923, two years after his presentation of the glass skyscraper he was to write about the purpose of the tower:

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 expenditure of means. The materials are concrete iron glass. 27
Consequently, despite his initial utopian projections and Rowe's interpretation of them, Mies' understanding of the office tower was not far divorced from its understanding by the architects of the Chicago school.

An unprecedented set of social and economic conditions demanded concentration of commercial activities, augmenting the value of land supporting such concentration, facilitating the evolution of increasingly higher structures that essentially multiplied a given site area. The adoption of the uncompromising expression of the frame by Chicago architects not only initiated the development of a structure that would become later the tallest type of tower, but also essentially transparentized the tower by opening interior spaces and in conjunction with glass, the exterior facade, a gesture creating broad expanses of space and flow of light, presenting a startling contrast to earlier heavy enclosed towers. The new material iron, dramatically tested in the virtually empty "useless" Eiffel Tower, a tower unrivalled in its openness, was now integrated with a strictly utilitarian purpose. The elevator reinforced such an integration; now one was able to justify commercial towers of heights not previously considered attainable in light of potentially inconvenient vertical circulation. Never had the tower been so useful. But though this radically transformed tower appeared as a cohesive, unrestrained final solution, it realistically represented a collection of disparate contextual attributes that even Sullivan professed to acknowledge. The new towers, in their severe disjunction with earlier tower conventions, for Giedion played a critical role in the initiation of the indirect progression to the pure, formal expression of
the modern office building. Such a disjunction and the progression that followed it was meaningless for Wright, however, because it was inextricable from the conditions that promoted it:

To such the skyscraper will be great monuments marking the spot where pride once stood to declare that progress is necessarily commercial, twentieth century gravestones. Not milestones on the road to progress as we would like to believe.
NEW YORK: THE EMPIRE STATE AND THE WOOLWORTH BUILDINGS

The skyscraper became a symbol of prestige for the American city; it was as much desired on the broad acres of western cityscapes as on the tightest plots in Manhattan. 1 When a skyscraper was proposed for Portland, Oregon in 1911, it was assumed that the incentive for its construction was civic as well as commercial: it was in part projected to "advertise" the town. 2 Competition occurred between cities as they attempted to assume a Manhattan-like massiveness: the image Manhattan presents the world in the unprecedented arrangement of its towers makes it an exemplary, enduring symbol of America. As the street plan of the city comes irregular at its tip they jostle together like the uncontrolled "competitive crowd" they in reality are. 3 In their density and massiveness they form a powerful first impression of the distant spectator.

Though it is commonly believed that the commercial office tower was invented in Chicago, it received its highest expression in New York. In the year 1900 the city of Chicago had passed an ordinance that practically outlawed the skyscraper by placing the allowable height limit at 260 feet and in 1914 lowering the limit to 200 feet. However, such ordinances were not instituted in New York and therefore it was not prevented from becoming known for its towers. As early as 1875 it began a transformation from a horizontal to a vertical
city through the erection of a series of tall office buildings. In 1865 commercial buildings were generally about five stories tall and sixty feet high, but within a period of seven years architects were planning buildings four times as high. In New York innovation in construction played an insignificant role. The potential of the frame, as it was to be developed and expressed in Chicago was virtually ignored, instead self-supporting load-bearing masonry was used in combination with iron columns for interior support. The elevator and fire-proofing methods contributed most significantly to increasing height, although they were subservient to the dominating factor of economics. 

In the early part of the twentieth century, the tall office building seemed to present the most exciting problem on the New York architect's drafting board. In their enthusiasm over their role in the creation of a new skyline, designers were able to reconcile their aesthetic sentiments with large scale enterprise. Sullivan's direct approach towards structure was deemphasized as the more common skyscraper treatment became the classical tripartite formula of column, base and capital. Its only serious rival was also archeological, but emphasized the verticality of tall buildings and crowned their tops with Gothic detail. The Woolworth Building initiated this approach. The impressiveness of the Woolworth Building at the time primarily resulted from its isolated position in the cityscape and its vertical expression of the frame. Delineated and fire-proofed with white terra cotta, vertical piers soared to their culmination in the Gothic detail. The decoration exhibited more than a process of simple magnification; from the street level or at
close observation, it was distinctive and elegant in its series of projections, recessions, and depth of light and shadow. Constructed in 1913 by Frank W. Woolworth at a height of 729 feet, it was for a long time the tallest tower in the world next to the "skeleton" of the Eiffel Tower. The builder was fascinated with its technological wonders: there were "3000 telephones in operation throughout"; "twenty-nine high-speed electric lifts", the highest in the world at the time and containing innumerable safety devices; it did not "sway or vibrate" and would stand up to a "hurricane blowing at the fantastic velocity of 200 miles an hour"; the sub-basement housed a "power plant which had "four mighty engines and dynamos operating day and night... the most efficient known to engineering science." When it opened on April 24, 1918, President Wilson pressed a button in the White House and 80,000 brilliant lights instantly flashed on. It achieved fame abroad; approximately 290,000 people from 60 countries visited its observation deck each year.

The Woolworth Building design was an example of the contemporary attitude that a historical style should be applied but that structure should also be acknowledged. Tafuri claims that when it was designed, the architectural process had actually been split in two; the effort focused on formal design was reduced to allow concentration on structural and functional aspects. In this way, the purely conventional character of "styles" became emphasized and the organic conception of architecture was undermined as architects fell into line with the methodology of City Beautiful. Such an approach was to only further encourage the
demand for "idealistic masks" on the part of enterprise. 7 But for Rector S. Parkes Cadman, who endorsed the "Cathedral of Commerce in a prayer-book brochure (did his parish, likewise, receive a financial endorsement?), the structure was a glorious expression of the business "spirit":

Here, on the Island of Manhattan, and at its southerly extremity, stands a succession of buildings without precedent or peer.... Of these buildings the Woolworth is the Queen, acknowledged as premier by all lovers of the city and the commonwealth, by critics from near and far, and by those who aspire toward perfection, and by those who use visible things to attain it. When seen at nightfall bathed in electric light as with a garment, in the lucid air of a summer morning, piercing space like a battlement of the paradise of God which St. John beheld, it inspires feelings too deep even for tears. The writer looked upon it and at once cried out, "The Cathedral of Commerce" - the chosen habitation of that spirit in man which, through means of change and barter, binds alien people into unity and peace... 8

Montgomery Schuyler believed that for a "distinctly utilitarian" structure such as the Woolworth Building, the great architectural success was "eminently the success of an expressive treatment." Such an achievement, especially in the crowning feature where space must have been sacrificed, commemorated the client's "sense of civic obligation" as well as the "the inventiveness and sensibility of the architect." 9

Records in altitude in New York were ephemeral. In 1901, the Park Row Building boasted of its eminence on the skyline, claiming that it "scrapped the highest clouds" in New York, but shortly thereafterwards it
was followed by the Singer Building, the Metropolitan, and then the Woolworth Building. The Woolworth Building remained the tallest office building in the world as New York continued building enthusiastically in the years 1925 through 1932, the projects in progress withstanding the impact of the Depression, and in 1930 the Chrysler Corporation completed its tower at 1046 feet. It was now legitimately the highest tower in the world, exceeding the Eiffel Tower by 62 feet. But this record was fleeting. One year later in 1931, the Empire State Building was topped off at 102 stories with a total height of 1,250 feet. Such an obvious competitive display led Montgomery Schuyler to ask as early as 1913:

What next? Truly, what is the limit? It is very clear the limit is commercial, not technical. In the absence of restraining laws, every projector of a building built for profit will carry it as high as he thinks it will pay him to carry it.... Meanwhile the competition is not only commercial, but in a measure artistic.... And probably there is no cultivated and ambitious architect, even though as yet "no man hath hired him" to do a skyscraper, who does not carry around in his mind, and in his leisure moments fondle, some idea of the skyscraper he would like to build.10

For Hugh Ferriss, whose mountainous images of cities were sublime, but almost forbidding in their primitive massiveness, the race to the sky among towers could only facilitate his urban ideal of density:
The most popular image of the Future City - to judge by what is most often expected from the draughtman's pencil - is composed of buildings which, without any modification of their existing nature have simply grown higher and higher. The popular mind is apparently intrigued by height as such. A 60-story tower in New York evokes a 70-story tower in Chicago. What is more serious, a 60-story tower in New York evokes a 70-story tower across the street. The skyscraper is said to be America's premier architectural contribution to date, popular fancy pictures the future contribution to be rows of still higher skyscrapers; in other words, it pictures 70-story skyscrapers side by side for miles. 11

The skyscraper was an expression of the social and economic changes characteristic of the era of its creation. The earliest office towers were built by insurance companies, organizations whose business was entirely bureaucratic and whose day to day functions created a high demand for office space. The expanding commercial sector eventually produced on the skyline a configuration of structures that were expressive of the concentration needed to accommodate a huge volume of communication and the other transactions indispensable to its existence. Support activities such as stores, restaurants and hotels, remained advantageously located in urban centers; their chief market had now become the office agglomerations. Land use intensified and swelling land prices stressed the importance of maximizing every square foot for the purpose of supporting as much rentable office space as possible. 12

The density of tall buildings in the absence of zoning controls began to choke space and movement in commercial centers. To maintain a minimum standard of
light and air and in congested areas among towers, the first legislation to control real estate development in New York, the Zoning Resolution of 1916, was developed. It established legal control through city government over heights by the establishment of progressive building setbacks determined by the rule of the "sky angle" and in this way initiated a skyline of towers gradually receding at specific predetermined heights as office stories made their upward climb. Despite these regulations, inherent in the arrangement of the towers was the shawdowy canyon-like atmosphere created in the streets. Not necessarily pleasant or salubrious spaces, they were nevertheless, at least for Vincent Scully, sublime. The romanticism of this dense urban agglomeration is captured in the astonishing drawings of Hugh Ferriss. Architectural publications and journals were filled with his idealized skyscraper images. The public could now associate the lofty tower with their dreams of urbanized America: skyscraper development of this kind appeared to be a reasonable and exciting prospect. Metropolis of Tomorrow opened with a dramatic description of the early morning fog lifting from the towers of New York. The second section offered carefully delineated suggestions covering set-back envelopes and the third and final section in its representation of an imaginary metropolis, or city of the future, became propaganda for the type of control offered by zoning and "regulated speculation". His drawings conveyed the construction of the city by "mythic, superhuman forces". The entire population of these metropolitan visions seemed to live a "glamorously decadent penthouse existence" unaware of social conditions unless directly affected by them.
The obscure quality of the drawings veiled them in a serenity that failed to conceal the tension caused by the presence of a power that would in reality be capable of creating such an environment: its brute force was frightening. Ferris was not totally oblivious to implications such as these that went beyond the superficial character of his graphics, though he seemed to savor the delight he experienced in the recognition of underlying truths:

Yet, if we relinquish the picturesque, to assume the more critical viewpoint, do we not begin to apprehend, in this headlong ascent, something ominous? It is not a little disturbingly reminiscent of the Tower of Babel? Certainly there are conscientious city-planners who perceive, in the present trend toward closely juxtaposed towers, a serious menace. The trend indubitably exists; and it is therefore proper perhaps, for the draughtsman to indicate where it will lead if it is unchecked. Such drawings, however, far from being intended as an inspiration, may serve rather as a warning. "It may look like this - if nothing is done about it." 16

Essentially a commercial style, Art Deco, or Style Moderne, dominated artistic production for the two decades of the nineteen twenties and thirties. Because the skyscraper was considered the archetypical American building in the 20's and because Art Deco was considered an "international" style by architects, they believed they had achieved preeminence in the practice of it because of their skyscrapers, a building type greatly admired in Europe at this time. The strength of the Beaux-Arts tradition in New York prevented architects from initiating a revolutionary style or
from completely breaking with the past and instead led them to pursue a rephrasing of existing design approaches. They depended first of all on, by then, a traditional form of commercial style found in America, the office tower that had its beginnings in late nineteenth century Chicago. They made no major structural changes in this type and avoided any significant changes of the internal subdivision of office floors. Many of the precepts found in Louis Sullivan's polemic for the skyscraper, "The Tall Office Building Artistically Considered" of 1896 were applicable to the Art Deco skyscraper. The critical attribute of height or "loftiness" could be captured in these towers: as Sullivan had emphasized this characteristic with piers rising continuously from the second level to the attic level of the building with recessed spandrels and windows, the Art Deco skyscrapers also relied on piers, whether heavily articulated or slender and in their verticality they became the dominant feature. The most obvious feature of Art Deco was its gracious use of ornament; rich textures and color were gained through the combination of a variety of materials, primarily stone, brick, terra cotta and metal. The ornament placed at the top of the buildings was scaled for a distance whereas detail at the street level and in entrance areas and lobbies became more tactile in appearance, suited to the immediate experience of passers-by. Evolved primarily to serve big business in New York, inherent in the stylistic approach of the American version of Art Deco was the potential for first-rate advertising: it effectively attracted and kept the attention of the public. Unlike the creations of the International Style, it provided a sensory experience through texture, color, decoration and tactile effect. It was theatrical.
One of the last towers of the short period of production of skyscrapers in the Art Deco style was the Empire State Building designed by Shreve, Lamb and Harmon. At the time it was designed the endeavors of the Art Deco architects had been affected by their acute awareness of the machine as a necessary feature of modern life. The handcrafted Expressionist-influenced exotic quality of the earlier Art Deco style had disappeared and was replaced with a more severe, austere, streamlined imagery. Consequently, the forms of the Empire State building appear more machine-like and its crowning device, a mooring tower for dirigibles was functional, at least in a symbolic sense. The massing of the tower follows the setback requirements of the zoning law. The entrance lobby is three floors high; the core of the building is in its center, located with essential provisions for elevators, stairs, and building services. The building base, impressive in its monumentality, is topped with a 60-foot wide terrace that sweeps back to the base of the tower. From this point the tower steps back gradually, meeting specified zoning requirements for light and air, and then soars an interrupted distance towards the sky. The elevator system was not only one of the key generators of the plan, but also affected the height to which the building could rise. In the early design phase planning efforts were primarily concentrated on the thirtieth floor of the structure where the tower had to meet the zoning requirement restricting the size of its floor area to one quarter of the property area. This meant a trade-off had to be made between the size of the core and the floor area available for rent. The most economical floor arrangement was sought that simultaneously provided the greatest
number of elevators. The final plan consisted of a ring of office space 28 feet deep surrounding the core. The overall size of the floor diminished as the building increased in height and the elevators decreased in number. The weight of the envelope was reduced by substituting masonry with metal windows, cast aluminum spandrels, and the chrome-nickel-steel alloy trim. The spandrels were dull silver, sandblasted to obtain a rough textured surface and the shiny column-like trim emphasized the verticality of the structure. A critical design determinant was speed of construction: details were thoroughly analyzed by the builders and architects, handcrafted work was avoided as much as possible, and prefabrication was relied on to the extent practicable at the time. Materials were shipped from all over the country, pre-cut or pre-fabricated in preparation for the assembly-line construction process. 19

The owners of the building were a group of speculative developers: John Jacob Raskob, the co-creator of General Motors, Coleman duPont and Pierre S. duPont, the latter a president of the chemical industry's leading empire, and two lesser tycoons, Louis G. Kaufman and Ellis P. Earle. They chose the ex-governor of New York State, Alfred E. Smith, as their leader. Their dream was to build a skyscraper that in its simple beauty surpassed any skyscraper ever designed and that met the requirements of the most meticulous tenant in the suitability of its interior spaces. Demolition began on the Waldorf-Astoria hotel that was currently occupying the site on the first of October in 1929. Despite the stock market crash, the project moved ahead. Earlier financial investments meant the
developers could take advantage of the favorable economic conditions for construction that were brought about by the Depression. The first upright piece of steel was set on April 6th, 1930 and by December 1st of the same year the steel frame had been completely topped out at 1,250 feet. On the same day the limestone exterior was carried its full height and the sequence of interior construction proceeded it, completing the building considerably ahead of schedule on May 1st, 1931. Constructed of 58,000 tons of steel, ten million common bricks, nearly three million face brick and pieces of terra cotta, nearly three million square feet of limestone and nearly 70,000 cubic yards of concrete, it is obvious that a considerable amount of organization, skill, and attention to the minutest detail was required. Several innovative approaches were used to speed construction: the equipment floors were carefully planned to distribute materials efficiently, there were railways in the basement and on the first floor, an overhead monorail, seventeen internal hoists, and gigantic brick hoppers that delivered the bricklayers their material "untouched by human hands." In reality it was rare for a building of this magnitude to be constructed without the sacrifice of workers. According to Mike Cherry in On High Steel, during the Depression, gangs of workers would wait on streets and near job sites so that when a worker fell, they would
be immediately available to take his place. The efforts of safety campaigns and insurance companies were futile because of the pressure by developers to expedite projects. 

Unlike the glorified heroic version of the worker depicted by the press, Mike Cherry relates the job conditions more realistically, from a standpoint that could only be acquired through the intimate relationship afforded by direct experience:

One day one of the connectors went to pieces. There are endless stories of men freezing on the iron, but I've seen it only happen once. He was coming out from his connection toward the choker to cut the piece loose when one of his feet slipped off.... He dropped to the beam, curled his arms and legs around it, and put his face down on the top flange, which knocked his hat off.... I was almost directly below him, a vertical distance of no more than twenty-five feet, and could see his hands gripping the bottom flanges. The knuckles were white. His nose and chin showed over beam, and they, too, were white.... The other connector went out the beam to the man, sat down, and began talking to him. He tried to pry one of MacDonald's hands away from the flange but failed... "Love pats won't help," called the signalman, "you got to cold conk him." He and the other connector exchanged stares. The connector shrugged, put a three-inch bolt in his fist, and gave MacDonald a shot that should have knocked all his teeth out. Blood spurted everywhere and MacDonald's body went limp. The crane lifted him up, swung him a couple of feet to one side, and lowered him to the ground. 

In 1971, the first of the twin towers of the World Trade Center in Lower Manhattan superseded the 102
stories of the Empire State Building with its 110 stories and a total height of 1,350 feet. Though it is no longer the highest building in New York, the Empire State Building remains the symbol of the city in many ways like the Eiffel Tower is a symbol of Paris. It is still one of the largest tourist attractions in the world. It draws more people than other sites in New York such as the United Nations Headquarters, Radio City or the Statue of Liberty. The views from the observatory encompass the city and extend under conditions of high visibility for about fifty miles into five states. Hollywood used the heights of the dirigible mast in 1933 for what was to become one of their classic films, King Kong. Here the mortal "primitive" beast was conquered in the midst of "advanced" civilization as the building made a claim to immortality. On an overcast day in July 1945, an Army Air Force bomber that had apparently just changed its course from La Guardia to Newark airport zigzagged across the foggy skies of Manhattan at 1000 feet, dodging the tops of buildings until the Empire State Building "suddenly appeared before him out of the mist." The plane plunged into the building as its wings were torn off, creating a 20 foot puncture in the facade. It struck an I-beam in an elevator shaft causing two elevators to drop from the eighteenth floor to the sub-basement; the cars were destroyed but the lone elevator operator survived. In 1955, the American Society of Civil Engineers designated it one of the Seven Wonders of American Engineering. The lobby contains sensational illuminated depictions of the Eight Wonders of the World, the Empire State Building, of course, being one of them. Because of its
prestige as a landmark and because it has become a myth in the public mind, it has acquired an edge on its competitors in the office space market and can attract tenants from all over the world.

For Tafuri, who believes the skyscraper is an "element of mediation" that does not wholly identify with the reasons for its own existence and therefore remains detached from the city, the Woolworth Building in its soaring telescopic logic nevertheless corresponded to its situation on the urban scene and the Empire State Building could justify its height by the pioneering function it served in Manhattan. Until the criticism of the 1940's from progressive circles, one was still able to sense the integration between the skyscraper and the metropolis. 27 Diana Agrest found that the use of the Gothic and Beaux-Arts eclectic styles helped make the towers, representations of economic "progress" and its associated set of values more acceptable, to transform "fiction" into "verisimilitude". 28 The expression achieved by the use of a stylistic convention for amelioration of the frame alluded to past monuments and their associated set of past values. Yet the artificiality of such a gesture can be understood with little visual acuity. What the New York architects and their clients had done was to find a more palatable method by which to deal with the very same conflicts faced by the Chicago School. However, the associational value of post World War I skyscrapers is more than stylistic, they also represented an era of economic optimism of the quality expressed by Rector Cadman. Though the Empire State Building was built during the Depression, a propitious situation for the constructor, an adverse arrangement for workers, it managed to retain
the attributes Scully was referring to when he claimed the Depression killed off the "old skyscraper" and all of its associated qualities." As an increasing number of towers were built, the resulting combination of eclectic styles reflected and reinforced one another in their dialogue on the cityscape, providing a unity to the totality. In the density of skyscraper construction, the isolated tower lost its previous, more common, urban attribute as a landmark; the complex aggregation instead became the landmark, the symbol of Manhattan to the world. In the chaotic mountainous image the Empire State Building rises slightly higher, just enough to insure recognition by the casual observer; for this reason and because its tallness was the result of a pioneering effort, an achievement with which it retains association despite construction of taller building, it has recognized more than the level of imagery found in the aggregation: if one building is representative of New York, it is the Empire State Building. Because it has achieved this status, because it forms an inseparable architectural bond with the city, because it was known as an amazing achievement of construction technique and coordination, because it was the tallest, because it is conventional and therefore "acceptable" stylistically, because with time it has become a greater and greater myth, it is much easier to associate it with many of the qualities we attribute to towers of the past. It is a tremendous effort to peel off this complex layering of meanings to find that its essence, its frame, the mundane purpose for its existence, has been most convincingly disguised.
Frank Lloyd Wright's attitude towards the skyscraper was established as early as his Hull House lecture of 1904, "The Art and Craft of the Machine". By designating the modern office building a "machine pure and simple", he was referring to both the social phenomenon that created and used it, or commercial enterprise, and to the building technology necessary for its creation, or the "steel frame of commerce." ¹ For Wright, the skyscraper eclecticism prevalent in New York was the inevitable result of a conflict between the machine, or commercialism, and the steel frame, or the structural tradition initiated and developed in Chicago. Consequently, the notion of the machine inherently contained a dichotomy, a conflict that was to be emphasized in his later writings. The eclectics, or "fashionable followers of Phidias" had attempted to conceal the frame, to make it another type of architecture, a monument or a minster. ² He believed that though one may object to what the frame represents, one should not hide the truth; it is not difficult to find deceit in such masking.

In a 1918 lecture called "Chicago culture", Wright again criticized the typical approach of the American skyscraper architect who denied expression of the true aesthetic of height by simply stacking a series of artifacts. He cited Louis Sullivan's skyscraper polemic, for it was Sullivan who "seized its height as
a characteristic feature and made it sing; a new thing under the sun!" Wright's loyalty to the line of development of the Chicago tradition was shown in his design for the National Life Insurance Building of 1920-25. However technically it represented a dramatic modification of the frame developed by his Chicago counterparts: its structure of large pylons carrying electrical, plumbing and heating conduits supporting cantilevered floor slabs was planned for fabrication on a unit system, the application of the "kind of standardization that gave us the motor car." But in 1924, he forcefully spoke out against the skyscraper, not only as a building type that had been exploited by enterprise, but as a phenomenon that facilitated centralization. In "Experimenting with Human Lives" he admits that Chicago and New York were nodes of intense, concentrated activity and had no choice but to resort to the skyscraper, therefore it was an excusable alternative, considering the conditions that prompted its origination. But otherwise it was only a commercial expedient, a false expression of civic pride, and dangerous to construct and maintain. Skyscrapers only encouraged congestion as cities increasingly became less habitable for those who valued their individuality: "who sleeps, who lives in New York and Chicago's canyons if he can get away?"

Although St. Mark's Tower was designed for "centralization or decentralization", Wright believed it would be best utilized as a means of freeing the city of "demoralizing congestion", enabling people to spread out in the country and up towards the sky. Such an attitude towards the dispersal of the congested city
paved the way for the creation of Broadacre City in the early 1930's. The Tower was a reinforced concrete floor system cantilevered from a central supporting structure, a tree-like configuration with a "tap-root" foundation, exemplary of Wright's organic approach to architecture. The exterior was covered with a scintillating membrane of copper and glass. Articulated volumes of space were generated around the central structural members, conceived in plan as a series of nuclei which, for Colin Rowe, explained Wright's avoidance of the steel frame; its rigid cellular divisions prevented the fusion of structure with space. 

Conceptually, the St. Mark's Tower scheme was the basis of virtually all of Wright's later skyscraper projects. Originally designed for St. Mark's Park along Second Avenue, between 11th and 12th streets in New York, the tower was later taken from its urban context and placed in the Broadacres plan where, by attributing it with a key role in the formal organization of the scheme, Wright reinforced his initial premise that the skyscraper was only feasible if placed in an unbounded landscape. As the "tree that escaped the crowded forest", it was eventually realized as the Price Tower in Bartlesville, Oklahoma. For Giorgio Ciucci this isolated location was symbolic of the "new conquest" possible only in America's provinces. Aggregations of the St. Mark's project appeared as the Crystal Heights Hotel design of 1940. Its projected location was an outlying area of Washington where "it was intended as a response to the official architecture of the Mall." The aggregation actually strikingly demonstrated the individuality of the Tower and reinforced its suitability as an isolated object. The Johnson Wax Laboratory Tower of 1939 located at Racine, Wisconsin was a version of St. Mark's
Tower in condensed form. The exterior skin transformed from its angular, crystalline character to a banded screen of alternating sections of brick and horizontal glass tubes that sleekly enveloped the structure.

Wright's plans for decentralization, for replacing the cumbersome "masonry caverns standing to the streets", for converting the city to a park, for dispensing the "gleaming shafts" of St. Mark's prototype through the greenery, was "betrayed" by the "captain of industry" who sentimentally gratified his "perverse acquired taste" by wasting his "machine made millions in reproducing an antique Gothic minster". In "Tyranny of the Skyscraper" of 1930, such skyscrapers were referred to as "space-makers for rent" that were built to solve the problem of congestion, yet with their increased numbers and increased height only facilitated congestion: "the ground area used to be multiplied by ten, it was soon multiplied by fifty, and it may now be multiplied by a hundred or more". Such congestion led to the

"overpowering emphasis everywhere of the cell in upended structure; continual slicing, edging, inching, in all the crowding. Tier above tier rises the soulless habitation of the shelf. Interminable empty crevices run up and down the winding ways of windy unhealthy canyons."

In general, the skyscraper in the context of the city was perceived in much the same way the relationship of the skyscraper to commercial enterprise had been understood by Wright earlier. The Machine represented in one respect the technological resource that enabled the creation of the structural framework and its fabricated skin, but in another respect the social conditions, the concentration of enterprise, that demanded the develop-
ment of the skyscraper type. For Wright, concentration of capital was actually the equivalent of the congested city. As he had surmised in his lecture of 1901, the city was also the machine:

"If the pulse of activity in this great city, to which the tremor of the mammoth skeleton beneath our feet is but an awe-inspiring response, is thrilling, what of this prolific, silent obedience?

And the texture of the tissue of this great thing, this Forerunner of Democracy, the Machine, has been deposited particle by particle, in blind obedience to organic law, the law to which the great solar universe is but an obedient machine." 

Therefore the skycraper as a commercial expedient represented the abuse of the technical developments that led to its creation, for Wright it was truly "a mechanical conflict of machine resources. An internal collision!" The only solution to such a conflict was the dispersed, anti-urban Usonian settlement suggested by Broadacre City.

Wright nevertheless believed that "a tall building may be a beautiful thing." When the skycraper was detached from the conditions that produced it, the "internal conflict" of the Machine could be resolved; it inherently possessed potential for the spectacular. His proposal for the Chicago World's Fair presented an opportunity for such imaginative speculation:

Why not, then, the Fair itself apotheosis of the skyscraper? Build a great skyscraper (in which the Empire State Building might stand free in a central court) devoted to all the resources of the modern elevator... If elevators handle the population of New York,
they could handle the crowds at the Fair. Why not handle the crowds directly from several expansive tiers of mechanized parking space, great terraces from which the skyscraper itself would rise. The construction should be merely the steel itself designed as integral pattern in structural framing. Then concrete slabs for floors above floor-garden floors intervening as restaurants. Instead of glass for enclosure—some light, transparent glass substitutes might be used; the multitudinous areas thus created would be let to exhibitors. The top stories could be garden observatories, pleasure places.... The Lake Front Park itself would be mere landscape adjunct to a great modern structure which might easily rise two hundred and forty-five stories, say two thousand five hundred feet above the lake level—or about a half mile high. The clouds might naturally or artificially drift across its summit. Or effects be created by aeroplanes laying down colored ribbons of smoke to drift across it. 17

Wright's romanticization of the skyscraper and his rejection of its exploitation by industry, evidenced the dense accumulation of vertical construction in the city, inevitably drove him to create an idealized version of the skyscraper that grew out of the desert of Usonia. An exaggeration of all the facets that across time additively could be called a "skyscraper polemic", it was St. Mark's Tower blown to a gigantic scale; the dream of dispersal was now another isolated tower, but additionally a city turned in upon itself and surrounded with an endless countryside.

Wright called it a "sky-city". A core structure similar in concept to the Price Tower and the Johnson Wax Laboratory Tower, concrete floors were cantilevered from a central core that accommodated the building mechanical and electrical systems. The exterior was
covered with golden metallic sheathing. Windows were recessed to avoid glare, to emphasize the brilliance of the skin, and to provide a sense of protection to the occupants. The one mile high 528-story tower could support 130,000 inhabitants. Elevators were designed to operate on atomic power and were capable of traveling at approximately a mile per minute. Included on the site were provisions for 15,000 automobiles and two heliports capable of handling 50 helicopters each.

Another city within a tower that perhaps can be considered the "realistic" version of Wright's ideal solution, the John Hancock Building in Chicago contains office space, apartments, restaurants, shops, and athletic facilities. One can virtually live there without leaving the building. The structurally efficient Chicago frame was developed into a structurally more efficient tube form articulated with cross-bracing, initiating an "oil derrick" aesthetic. Unique in their lofty location, the spectacular apartments are the highest in the world. An upper level observatory accommodates 500 people and provides an unparalleled view of the city. But observers claim that they sense they are viewing out of an "airship", they feel detached from the civilization below. For Tafuri such structures are part of the urban environment yet "refuse to participate in it." In their detachment from the city they communicate nothing but their "own surreal presence". They are "antiurban paradoxes" because they harbor the conflicts of the metropolis within their enclosure and negate the city itself in their attempt to reject its irrationalities. He believes that at least Wright's Mile High Skyscraper had an "internal logic": it had condensed the city and coherently placed
it on the ideal landscape of Usonia. 19

Some critics imply that because projects such as a mile high tower were created during the last decade of Wright's career when his "spontaneity had dwindled" and was replaced by a "propensity towards intellectual strain and a growing intensity in the propagation of his views", they should be regarded as lacking serious intent. 20 Though there is probably some truth in such claims, as a utopian projection the Mile High Skyscraper was for Wright an expedient design by which to verify his attitudes on the aesthetic and technical potential of the skyscraper, and to assert his unwillingness to acknowledge its common association with the city and the conditions that dictated its inception. Its level of idealization is emphasized by its height, an impossible one. As an unachievable solution it represented two irreconcilable conditions: the social and environmental context it demanded was completely foreign to the notion of the skyscraper itself.
ANALYSIS

The meaning of the tower has been revealed in the previous arrangement of essays as a set of characteristics relating to the appearance of the tower, its function, and the purpose for its construction. Suspended in a larger contextual framework, meaning was defined, adapted, and reinforced by immediate historical and environmental influences. As frameworks shifted with place and time, some aspects of meaning appeared repeatedly across the transformations and emerged as themes. An examination of the themes and the interrelationships they reveal between given contextual frameworks will potentially provide a greater understanding of the towers themselves, their relationship to their framework and to other frameworks, and their relationship to the skyscraper of the present day. The themes of height, transparency, density, and agglomeration relate to the appearance of the tower and the themes of signaling, defense, and habitability relate to the function of the tower. The themes of ascension, viewing the earth, competition, legitimization, and civic landmark relate to the purpose behind tower building. Some towers have assumed an altered meaning independent of their original context or independent of any realistic context; such towers are myths or idealizations.

APPEARANCE

The appearance of the tower refers to its outward aspect, its general visual impression, rather than to stylistic
peculiarities or attributes

HEIGHT

From the construction of the earliest towers to the towers of the present day there has been a consistent increase in vertical scale, a manifestation of the universal tendency of tower builders to force available technical limits. However, the inclination to achieve an immense scale has occurred, like the activity of tower building, not continuously but sporadically throughout historical time; the achievement of the highest technical expression could not be visualized unless it was acceptable to a given context. The notion of acceptability was initiated with Babel. As a myth it propagated the lesson that such ardent, proud heaven storming was in fact not acceptable, was morally unjustifiable unless pursued for a purpose approved by God. But if the Alexandrians knew of the myth, it was disregarded. The Pharos was built three centuries later with the improved technology of fired brick and was more than 150 feet higher. The Gothic architects warranted their pursuits with the belief that they were building an artifact transcending earthly experience, in congruence with contemporary conceptions regarding liturgy, mysticism, scholasticism and a new understanding of the relationship between the individual, Jesus of Nazareth, and God. Though the cathedral architects must have realized in their approach to the ideal of soaring space and structure that they were formulating a new aesthetic, it was only in retrospect that their technique was truly appreciated. In the era of romantic doubt, when the realization of high structures was considered an appropriate means by which to evoke sublimity, to emphasize the power of the natural environment and the smallness of humanity, the quality of vastness in Gothic archi-
tecture was recalled in the first attempts at tower building since the erection of the last Gothic spire, such as the villa at Fonthill. The notion of sublimity was not forgotten when the Eiffel Tower was designed, but was de-emphasized in the face of the awe-inspiring potential of new materials and fabrication techniques and other more important considerations relating to height, specifically nationalistic display of industrial potential and technical achievement. In the early attempts at designing a 1000-foot tower, engineers knew they were testing the limit of a new building technology just as the Babylonians, the Alexandrians, and the Gothic architects had previously. The connection between romanticism and vastness remained as the tower was relegated to a pragmatic use. When construction density created crevices for streets in New York, Hugh Ferriss recognized the potential for the expression of sublime attributes such as obscurity, infinity, power and, of course, vastness and revived them in his drawings. J. Carson Webster, discussing the characteristics of the skyscraper, formulated a definition of "great height" that referred to Burke's notion of the infinite: "How many stories are necessary before it begins to seem difficult to take in their number, so that they seem numberless?" Current skyscraper building supports vestiges of the notions of the sublime and the heroic; some skyscrapers capture such impressions more readily than others in the detail of their surface appearance or the configuration of their interior. Constructors still harbor the inclination to exploit technical limits, though in recent skyscraper building such attempts have become less common as towers have gained altitude because of the existence of a delicate balance between attainment of height and economic feasibility, or the ability of a
city to support or individuals to finance a structure of considerable proportion.

**TRANSPARENCY**

Early towers were closed, dark and massive, expressive on the initial approach to building with masonry and stone. Babel lacked an interior. The Pharos at Alexandria was compartmentalized, but the small deep window voids allowed little admittance of sunlight. Romanesque towers were closed; the technical limits of stone construction had not been tested because, like the Romanesque church, they were intended to acknowledge the obscure and cryptic nature of the relationship between the individual and the supramundane. The Gothic architects were the first to realize the virtues of transparency, the quality that bathed the cathedral interior in light and emphasized the suspended weightlessness of structure. The openness of the spire and the cathedral corresponded to a modification of the conception of the Divine personality; religious art was to show mystical truths in visible form. Perception required light and consequently a voided structure. The Gothic ideal was extended in the Eiffel Tower as the strength to weight ratio of iron facilitated an unprecedented expression of openness and clarity. The dramatically altered appearance of the tower led Giedion to emphasize it in the formulation of his interpretation of the unprecedented multidimensional spatial experience that was coincident with the development of modern architecture. Skyscrapers had to be open light-admitting towers to be suitable for human occupancy, but it is also for this reason that protection from the external environment had to be provided, meaning that habitable towers will likely never rival the Eiffel Tower in transparency.
DENSITY

The Pharos at Alexandria was the earliest tower of magnificent scale to contain an internal system of circulation and a series of floors; it anticipated the internal organization of the skyscraper. The Round Towers generally contained four floor levels that were accessible by ladder. The stair was necessary for reaching the bells in Romanesque towers as well as in Gothic towers and spires. The tower at Fonthill had an open interior; its stair was located adjacent to it at lower levels and circulated around it near the top, arriving at two lofty observation platforms. The Eiffel Tower was an open structure supporting four open floors. All of these towers were capable of supporting more floor levels, but the economic conditions that facilitated the birth of the skyscraper had to create the demand for density, not only the addition of floors, but also the heavy partitioning of space at each floor level. Before towers of such density could be inhabited on a regular basis, a convenient, efficient means of vertical circulation, the elevator, had to be invented. Before towers could support a dense conglomeration of cubical spaces at lofty heights, an appropriate structural system, most commonly the frame, had to be developed and accepted.

AGGLOMERATION

Commonly found isolated, achieving independent prominence in relationship to their surroundings, towers assumed a clustered configuration when limited availability of land inside walls of medieval Italian towns and the popularity of erecting a tower near houses led to formation of groups of towers, often blocking sunlight, inhibiting ventilation, encouraging local outbreaks of battling. The need for regulation of such
construction was apparent but often unrealized in attempts to restrict the lawlessness of the nobility. Early skyscraper construction under conditions of restricted land area or of high land value or both, generated a density of vertical construction that was perhaps sublime, but not salubrious. Frank Lloyd Wright referred to such dense conditions as "forests" and preferred to see his towers stand as isolated trees in a decentralized landscape such as Broadacre City:

Has our country in the interval grown up to skyscraper status? No - the skyscraper takes a field trip of its own to a place where it belongs - in the country. I believe this type of structure, weighing but a fraction of Rockefeller Center structures, will become a "natural" everywhere in the United States....

The loss of light and air led to the institution of zoning regulations. Though often a futile effort in Italian towns, they had a dramatic impact on the early skylines of New York and Chicago, shown in the proportion of towering structures in one city as opposed to the other, and in New York, where the 1916 rule of the "sky angle" led to the development of a new skyscraper aesthetic, the setback block, dramatized in conceptual form by Hugh Ferris.

FUNCTION

The function of the tower refers explicitly to its pragmatic characteristics, to the use for which it was adapted or constructed.

SIGNALING

The Pharos at Alexandria and other contemporary light-
houses represented the earliest constructions that supported a signal, in this instance a flame for guiding arriving seagoing vessels. The Round Towers also housed a light, but it was instead primarily a warning beacon, as were the bells, for signaling the arrival of invaders. When bells came into wide ecclesiastical and civic use, housing was required, and the increase in number and scale of Romanesque towers was facilitated by this new utilitarian demand. High placement of bells was important not only for their effectiveness as a signal, but also for their prominent display; in most cases, like the tower, they were also a source of civic pride. As the tower elongated into the spire and assumed a dematerialized, loftier appearance and a greater symbolic role, its function as a signal tower was de-emphasized. Renaissance and Baroque belfries returned to a lower elevation where they assumed a functional but minor position on the skyline in relationship to the dome. The Eiffel Tower was not built as a signal tower, but its unprecedented height along with the new availability of electric light made the placement of a beacon on high an exciting prospect. The light was not only a signal, but also a spotlight; viewers had the ability to control their nighttime vista through choice of the location where the light was aimed. A high location was essential for the transmission of non-sensible energy. Communications posts, the tallest structures in existence today, were erected solely for this purpose. Skyscrapers, simply because they are high, are ideally suited for the support of such signaling devices. The transmission of non-sensible energy is continous, the association between the tower and the signal is not apparent, its permeation and extent invest it with greater efficacy than any signal of the past.
DEFENSE

Two attributes of the early tower made it suitable for defensive purposes. First, as a closed, massive form it was protective and strong, an ideal fortification. Second, because it was high, it functioned well as a lookout station; it was a natural watchtower. The Round Towers offered security for clergy and church valuables during barbarian invasions and a protected vantage point for active defense, indicated by the high location of the first floor level and the retractable ladder. They were ideal observation stations for scanning the countryside for clues of approaching danger. The Romanesque bell tower had similar defensive functions. Defense towers had enjoyed a long, extensive use in the design of walled fortifications where they functioned as strong points in the curtain, and in defensive strategy blocked the path of the enemy along the length of the fortification wall. It was this long success that inspired the town nobility to adapt the tower form for a circumstantial need not unlike the one that promoted its original use. The defense tower was employed in later fortification design, but gradually fell into disuse when the theater of war expanded and advanced modes of warfare and strategic developments rendered major fortification design impracticable.

HABITABILITY

Early towers had varying degrees of habitability or capacity to support occupation for an extended duration of time. The sleeping chamber at the top of Babel had very restricted access. The Pharos at Alexandria contained spaces for offices, perhaps for research, and storage; openings for light and ventilation encouraged continual occupation, although the stair approach
was certainly arduous and time consuming. The Round Towers were habitable for short periods of time; one can assume that if warranted, as in periods of prolonged siege, the defender could safely spend a number of days inside the towers although living conditions were less than ideal. Some Romanesque towers contained a similar floor structure, so they also could have supported habitation. The medieval city fortresses were habitable, though probably not on a permanent basis. Spires and town hall towers were occupiable. Eiffel had an apartment at the top of his tower, but it could support only a limited number of people. Unlike earlier towers, with the exception perhaps of the Pharos at Alexandria, skyscrapers are occupiable for extended periods of time, and in instances where they contain apartments, for example the John Hancock Tower in Chicago, they are habitable. The dense accommodation of occupants was beneficial to the bureaucratic functioning of young corporate enterprise. The erection of a maximum number of floors on a delimited urban land area was advantageous to financial speculators. To enable such a large number of people to live in a single tower necessitated the invention of the frame, an open light-admitting support with the structural capacity to achieve unprecedented heights. For access to offices and apartments, the development of the elevator was crucial and coincident with the notions of convenience and efficiency demanded in all aspects of early enterprise. Additionally, existing building services such as plumbing, heating, and electricity had to be improved and new support systems such as air-conditioning had to be developed. Unlike towers of the past, skyscrapers were extremely pragmatic, not only because they represented a direct response to the
potential realization of economic advantage, but also because of the overwhelming importance of the provision of building systems to the comfort of the occupants. Their direct or concealed manifestation in the appearance of the tower provided it with a utilitarian image that reinforced its pragmatic role.

PURPOSE

The purpose of the tower refers to the underlying non-utilitarian motivations behind its creation, larger considerations that are accessible, but tacit, and resistant to precise definition.

ASCENSION

The earliest, most powerful, most explicit aspiration towards heaven was, of course, the Tower of Babel. Here the city of Babylon, represented by the priests, attempted to make a genuine connection with the ultimate heaven, the absolute reality, with their gods. The connection had already been made symbolically with the terraced ziggurat. The anticipation and hope was to transform such symbolism into reality through an ambitious inflation of scale. Though as a myth Babel has acquired broad and varied interpretation and meaning, its fundamental purpose was its symbolic and anticipated role as a "stairway to heaven." The symbolism of such an aspiration in later church building is more complex. It is too facile to assume that the achievement of height in the expression of the spire was intended by cathedral builders to simply be a connection to the heavenly realm. But although the end results represent a diverse set of influences, the impression of
such a connection is nevertheless powerfully conveyed to the viewer of the present day. Initially the church tower had the more pragmatic role of a bell-house, stairway, watchtower, or defense fortification, with the exception perhaps of Aix-la-Chapelle, where the twin towers flanking the entrance carried connotations of rulership. As the tower soared skywards and became the Gothic spire, it gradually shed its utilitarian character to assume a greater expressive role. In the Renaissance dome, the imagery of the relationship between earth and the celestial realm transformed. The spatial experience of such a relationship becomes as much an internal one as it is an external one, or the view of a lofty monument on the skyline. Such a shift in imagery was coincident with the inception of Humanism. In Renaissance thought, the individual assumed a new central importance. Forms such as the circle and the sphere reflected a geometrical equilibrium where all parts were harmonically related like the members of a body. This human-created harmony was intended to echo a universal, celestial harmony. It was expressed in the cosmic interpretation of the dome, which represented the sky, and had been common from antiquity onwards; it was kept alive in the Eastern Church. The centralized, internal space created by the dome established a vertical axis that located a position where individuals could establish themselves in relationship to the universe. Humanist cosmology had relegated the tower to the primative and authoritarian cosmology of the pyramid and ziggurat because it seemed to dwarf the individual and suggest struggling ascent. From this time onwards, the tower lost the overwhelming significance it had in establishing the symbolic connection between earth and the supramundane, the heavenly realm. It would not
come back until the romanticists revived the notion of the drama and power of nature, and once again doubted the relative significance of the individual.

VIEWING THE EARTH
Certainly the top of the Pharos at Alexandria was a fine observation point: the Round Towers were excellent watchtowers, as were the Romanesque Towers; the towering urban strongholds offered an unrivalled advantage for watching the enemy, and if one dared to make the climb to the top of the Strasbourg spire, the opportunity for looking down on a random collection of medieval roofs and jagged narrow streets was unparalleled. But it was only when the awareness of human intrusion on the landscape was heightened, with realization of perspective, extension into space and rationalization of the landscape, as initially evidenced in Italian garden design, that the view of the landscape achieved a new importance. The earliest architectural manifestation of control and extension into the landscape, the Cortile del Belvedere, soon achieved prominence in relationship of the Italian villa to its garden. The belvedere, or high place from which rationalization and control of the landscape could be instantly comprehended, became established for the first time as a significant architectural feature. Wyatt's villa at Fonthill provided an observation deck view of a rugged "picturesque" landscape, though actually a designed one, since great effort had been taken to insure its appearance was wild, unruly, "untouched" by human presence. Romantic doubt was again revealed in the juxtaposition of the individual to the vast, "uncontrolled" natural environment. However, it was the Eiffel Tower that dramatized the view. The prospect was not only from on high, it was of Paris. Earlier
Victor Hugo had spoken of the view of the city from the towers of Notre Dame, but now city-viewing had achieved its culmination; the view was a genuine public attraction, immediately accessible to everyone. It was extensive, and entirely unrestricted, the open structure in its transparency and intersection with the distant landscape provided a new spatial experience Giedion later attempted to define. The vista was an artifact created by human efforts, not a natural landscape, but unlike the Renaissance and Baroque garden design it was an uncontrolled, unclear order, a human chaos revealed to previously uncomprehending eyes. After the Eiffel Tower, any later skyscraper of significance boasted a lofty observation deck.

COMPETITION

The struggle for prominence on the skyline was manifested in three forms: as competition among individuals in close proximity; as competition between cities, states, or nations at larger distances, where towers exist side by side only on paper on in the viewer's memory; and as competition with the past, where current designers or builders in their awareness of past examples made a major effort to exceed earlier achievements, a desire inseparable from commensurate technical capabilities. Competition among individuals was characteristic of medieval Italian towns. In stronghold construction, height was most commonly used for ostentation, though it offered the additional advantage of an elevated position from which to look down on competitors. Local political struggles left towers battle scarred. Immediate competition also appeared among civic landmarks, not a completely different phenomenon, since these towers were often only extensions of an individual such as the Podesta or the Popolo, repres-
enting a political faction, or of a group of individuals or "tower group". Destruction of the tower representing one group by another signified the victory of one institution or organization over another. For this reason towers such as these were often closely guarded in times of war or civil conflict. In New York and other American cities, the competitive urge of one individual or a corporation to dominate another on the skyline has continued to the present day. Competition of this kind has often inspired deliberate trickery and deception by one party of another, the ploy of misrepresenting proposed height during the construction process to avoid being surpassed on the skyline by another tower under simultaneous construction is a common example. The advantage of looking down on competitors was revived when executives located their private offices, conference rooms and clubs on upper floors of skyscrapers to overlook the city and its multitudinous number of commercial pursuits that their enterprises dominated. Le Corbusier elucidated this phenomenon in a visit to New York in the early 1930's:

Thus, in the Middle Ages, at San Gimignano in Tuscany, the struggles for control among the families of the little city brought about the construction of fantastically high towers one after another, each one higher than the last, height indicated the triumph of one family and the crushing of another. San Gimignano has the appearance of a pincushion and the spectacle delights tourists while troubling common sense; hirsute beauty—yes, beauty, why not?... In New York, it is by a thousand feet of height that the game is played— the game of skyscrapers, the sport of skyscrapers. Those mad Americans, how they have enjoyed themselves! 2
Competition between cities, states, nations, or towers in distant locations had its beginnings with Babel and Alexandria, where tower building became an extension of civic pride; when judging the scale of the structures, it becomes strikingly evident how these cities regarded themselves and were regarded by other settlements. The construction of town halls, the pride of cities such as Siena, Florence, and Bruges, as well as campaniles and cathedrals, was partially motivated by similar needs to assert local esteem and to establish oneself in relationship to surrounding cities. Despite the slow realization by cathedral architects of the completed structure, the notion of the possibility of achieving a greater edifice than a neighboring city, perhaps a rival, was always compelling. Perhaps it was the built assertion of competitive spirit that facilitated the contemporary cult of Giantism. During the hiatus in tower building of the Renaissance and Baroque periods, competition between cities was diverted into other building activities such as the creation of piazzas and squares. The three placos at Nancy, and the Circus at Bath; the larger scale achievement of Sixtus V in Rome, where a series of squares was connected with streets; and the later boulevards of Hausmann represented a human intervention in civic chaos that evidenced authority and control. When building high structures became an expression of technological potential, a source of industrial pride, inseparable for Paris or London from national pride, a competitive situation evolved where one country attempted to duplicate the achievement of another at a greater scale and on a higher rise of land, a more magnificent Eiffel Tower. In early twentieth century America, the skyscraper became a sign of economic viability and prestige. The greater the number of
skyscrapers a community possessed and the higher they were was an indicator of mercantile activity and established "worldly" importance. The aggregation of skyscrapers in Manhattan is the apotheosis of this notion: to the world they are not only a symbol of New York, but also of America.

Competition with the past became an objective as builders became aware of previously constructed towers or of history in general. It is perhaps an innate desire of individuals or communities to achieve more than has been accomplished by earlier civilizations through a daring expression of new technical potential or acquired skill. It is not without possibility that the Alexandrians, who constructed a higher tower, knew of Babel. There was an indirect, but an undeniable progression in height from the earliest Romanesque towers to the technical mastery of the Gothic spire. The Gothic architects were certainly aware of earlier construction and must have recognized their ability to steadily lift the frame and the spire of the cathedral higher as proof of their technical abilities. The desire to gain height and display technical mastery through tower building was de-emphasized through the Renaissance where technical achievement and monumentality was instead visualized in the dome. After the Industrial Revolution, as new materials were developed, a combined awareness of their new possibilities and of the past instilled the desire in engineers to prove their potential, as well as their own capabilities, through the construction of a 1000-foot tower, or the highest structure in the world. Initially financed by private individuals or investors, structures expressive solely of technical achievement became an exception in
tower building as their height was equalled and exceeded by land speculators and commercial enterprise. The desire to excel earlier established tower heights was intrinsic to early skyscraper construction.

LEGITIMIZATION
A recurring historical phenomenon, legitimization is the use of an architectural convention with a given set of associations by an individual or group either for establishing authority to a public audience or for justifying a powerful presence that is unquestionable in its dominance and well understood, but not particularly acceptable. The tower operates as an architectural convention on two levels: first, as a dominant architectural image it implies a ready association with authority; and second, because it is such a powerful image, it can accommodate a varied range of stylistic conventions that possess associations of their own. In the first instance, the tower has been an expedient resource throughout history for the assertion of the sacred or secular power of an individual, group or institution. It disappeared as a monumental image during the Roman Empire and Romans relied instead upon the temple front and the dome for display of authority. Bell towers came to signify the dominance of the Church and town hall towers represented the importance of civic institutions; their inception corresponded with the challenge of sacred authority by secular authority. During the Baroque period, sovereign power relied on the palace at the end of a controlled vista as a sign of dominance, an anomalous gesture, when viewed from a distance the monumental facade disappeared into the horizon. The tower was not revived as a sign of political fortitude until the twentieth century where it was employed by
authoritarian regimes, for example, at the Fascist capital, the EUR, where it became a six-story prism filled with simplified classical arches. Later examples, such as the Albany Mall, with its forced grandiose scale and featureless facades, represent the current abstract conception of government, an image not unlike the one found in many of the towers that support the bureaucratic structure of contemporary business enterprise.

The earliest example of the second instance, the use of the tower in combination with stylistic legitimization, occurred in Charlemagne's Chapel at Aix-la-Chapelle. By borrowing symbols of authority from Ravenna and Rome, most importantly the twin-towered entrance way, Charlemagne established his new position of power. Until after its transformation into the Romanesque twin-towered facade, the westwork embodied the complex associations found in the united sovereignty of the emperor and the Church. Fortification structures with blocky massive walls, heavy squat articulating towers, and various combinations of corbelling, crenellation and machicolation, provided a well-defined set of stylistic elements associated with the castles of the land-owning nobility that could be employed individually or in their totality for the purposes of creating an image of authority, often with underlying associations of brute power and frightfulness. Relied upon by the town-based nobility for construction of urban strongholds, the expression meant almost what it had in the countryside: pride in landownership, assertion of concomitant power, and a willingness to defend both. The convention was adopted for town halls in Volterra, Florence and Siena. The Palazzo Vecchio's fearsome aesthetic was counteracted with the use of ecclesiastical conventions, particularly the baldachino placed
above the battlements of the tower. When the cathedral builders had developed a well defined ecclesiastical style, it was adapted by Flemish builders and transformed into the most highly evolved civic version of the Gothic through the construction of prominent civic monuments such as the belfry. As the highest tower in Bruges, from its central location it assumed the role of the Gothic cathedral in other medieval towns. The use of an ecclesiastical expression as a symbol of commercial success helped legitimize engagement in such worldly pursuits by merchants and traders in a highly religious society. The tower articulations found in fortification architecture had an unusual persistence as conventional images. They appeared again in the Renaissance at the Villa d'Este and other contemporaneous projects initiated as part of a papal building program where as authoritative images they were used to signify the implementation of a papal policy for creating a national Italian empire. The Fonthill tower was very "public" despite its remote location; it was discussed, written about, painted and graphically illustrated. Here the Gothic expression was not only used to achieve the appearance of sublimity, but also for the purposes of tempering such a gesture of ostentation, for making it publicly acceptable, for moderating its impressive scale. The later application of Gothic ornament on, at the time, the canonical steel frame, was a method of attributing sacred connotations to a social organization that was not in any respect religious. Not unlike the belfry at Bruges in stylistic intent, the Woolworth Building was carefully articulated and refined in its artificial skin. A dominant gesture on the skyline, the powerful organization behind its creation necessitated legitimization, romantic attributions facilitated public acceptance and support. Such
associations led to speculation and congruences beyond architectural aesthetics that were difficult to define, comprehend, but not to recognize:

What figure the poet might employ to describe the skyscraper, dwarfing the church, outpointing the cathedral spire, I do not know.... But the purpose of the skyscraper is not poetic. Perhaps commercialism is a new God, only too powerful and too appealing, to Whom men are building today their largest, costliest, and most laudatory structures. In this service they are building higher and higher, concentrating more and more activity into less of ground space, stealing light and air from their neighbors, piously recording in their structures the exploitation that is [a] right-hand attribute of Commercialism.³

THE CIVIC LANDMARK

To be regarded as a landmark the tower must be representative of the city to outsiders, assume a dominant role in the urban fabric when seen from a distance, and be a source of civic pride. The Tower of Babel was one of the earliest landmarks. Though it can be assumed it was constructed primarily for religious purposes, it marked the location of Babylon on the horizon and was a great source of pride for Babylonians, an appropriate symbol for a city whose people believed they were at the center of the world, as suggested by the ceremony of climbing the ziggurat where the priests attained the "summit of the universe". More than a signpost and lighthouse, the Pharos at Alexandria, in its scale and grandeur dominated the shoreline near the city, it introduced and propagated the center of knowledge and wealth to arriving visitors. Inseparable from the city, the Gothic cathedral as the Heavenly Jerusalem was a city within a city, the nucleus of the town, it
was also its organic extension on the skyline. The village was gathered about its base; its vertical dominance was echoed by parochial church spires. It affirmed civic viability. Rising above church spires, the Bruges belfry was the equivalent image of the contemporary cathedral, it asserted the primacy of economic pursuits and established the economic solidarity of the town. Civic dignity during the Renaissance and Baroque periods was asserted in building projects that displayed human intervention in and control of the urban environment, such as the creation of squares and later streets and boulevards. Symbols of local authority appeared in the domes of churches such as St. Peter's in Rome or the Cathedral in Florence and in the monumental palace facades of princely mercantile families such as the Medici or of the sovereign, as indicated at Versailles. Though constructed by an individual, many of the private motivations for designing the Eiffel Tower were coincident with the spirit of a larger audience, despite protests. Indisputable in its reign over the city, its meaning is nevertheless highly complex. Its only ascertainable characteristic is the strength of its attachment to its environment; it cannot be severed from the Parisian fabric. Though the Empire State Building denotes Manhattan to outsiders, and though, discounting the World Trade Center, it is the highest tower in the city, it loses significance in its location in a random mass of competing towers. Instead the aggregation of towers has become the civic symbol, an unforgettable one when viewed at a distance or experienced through immediate contact with shadowy canyon streets. Like the belfry at Bruges, they stress the importance of economic pursuits and help establish the economic viability of Manhattan to the world. Verification of the strength
of this image lies in the attempted emulation of Manhattan by other American cities.

Detached from the Manhattan mass stands the twin-towered World Trade center. The highest set of structures in the city, inflated to a monstrous scale, they stand isolated, turned inwards in their refusal to acknowledge their urban surroundings. The critical linkage with the city has been broken; they are a dubious source of civic spirit or pride. Similarly the John Hancock Tower in Chicago is a foreign object; despite its domineering magnitude and its potential as a landmark, it hovers over the city and refuses to participate. As technological achievements and economic advantage encouraged increases in scale, skyscrapers climbed higher to gain an unrivalled position on the skyline. One would assume with such increased recognizability they would only be more magnificent landmarks. However the skyline has become so crowded that it is difficult to establish which tower is actually the dominant image. In the medieval town, problems of this kind were resolved simply through the dismantling of towers belonging to one group by another. New authority was immediately recognized from a distance. Though masses of towers have come to represent a city to outsiders in their dominance of the skyline, the sense of civic connection to such groupings or to individual towers has in many cases been weak or non-existent. The spirit of the "tower groups", campanilismo, and civic identification found in the towers of medieval towns has been undermined.
MYTH AND IDEALIZATION

The transformations of meaning described above referred to the meaning of the tower to a given context. Yet it is not unusual for towers to have acquired new associations outside of a given context, to have assumed a dramatically altered meaning. This has occurred in all cases to some extent, but certain towers have become exceptionally powerful conceptual images, they transcend their particular context, to become part of all contexts, they have become virtually continuous as an idea across time; such towers are myths. Towers that are only abstract conceptions also demand an explanation, they are unrealized dreams, often expressions of a powerful idea, perhaps a utopia; such towers are idealizations.

MYTH

The greatest tower myth of all time is the myth of Babel. As a material image transformed into a legend, it has recurred in various contexts where it was first understood as a historical incident with strong moralistic implications and later as a reference for any undertaking of overambitious scale. It was an illuminating resource for Goethe in his discussion of the cathedral of Cologne; he viewed it as

"The prototype of those gigantic conceptions straining upward to the skies in almost Babylonian fashion, so utterly out of proportion to the realistic means that its execution by necessity had to be interrupted." 4

Later it was mentioned with the same implications in a public outcry against the Eiffel Tower by artists,
painters, sculptors and architects, where it was pro-
tested

with all our might in the name of slighted
French taste against the erection, in the
heart of our capital, of the useless and
monstrous Eiffel Tower, which public ill-
feeling, often inspired by good sense and
the spirit of justice has already christened
the Tower of Babel. ⁵

The suggested congruence of the Tower of Babel with the
skyscraper was inspired by its features of daring scale
and by the moral implications in building so high out
of what has in some cases been considered arrogance and
pride. Frank Lloyd Wright believed the skyscraper had
exceeded the moral limit established by the myth of
Babel:

Yes - these super-most solutions are seriously
proposed to hold and handle landlord profits
in a dull craze for verticality and vertigo
that concentrates the citizen in an exaggerated
super-concentration that would have shocked
Babylon - and have made the tower of Babel
itself fall down to the ground and worship. ⁶

Montgomery Schuyler, referring to the towers of early
20th century New York, asked "What, if any, is the limit
of these new commercial Babels?" ⁷

The Round Towers are mythical simply because of the
speculation generated by their primitive origins and
mystical appearance. The campanile at Pisa, the Eiffel
Tower, and the Empire State building became myths as
they concurrently became increasingly popular as tourist
monuments. For Pisa, such status was far removed from
the original intent behind its construction, however
the Eiffel Tower, initially fabricated for an exhibition that attracted a wide range of visitors, has essentially retained its tourist status, though it is now another kind of tourist monument with another set of popular associations. By possessing such a status, both towers have become so well connected with their location that for the tourist they have come to represent the city. When one sends a postcard of the Eiffel Tower, for example, the receiver immediately makes the association of Paris. When travelers visit Paris they immediately expect to see the Tower in the cityscape. Because such monuments have become important to visitors, they have typically generated a series of dependent economic activities and have helped support local businesses that rapidly became reliant on a planned influx of tourists. When it was established that the leaning image of the campanile at Pisa was of economic value, great efforts were taken not only to keep it from falling, but to maintain its leaning position. What would have become of the Pisan tourist trade if consultants, rather than raising the foundations of the tower so it assumed an "appropriate lean", instead restored it to an upright position? Consequently, the tower that has become a myth in many cases has also become a tourist site, a monument for distant travellers and sustenance for a localized economy.

IDEALIZATION
Idealized towers may be the towers of dreams, as Bachelard refers to:

And so our dreams attain boundless proportions ... at the end of countless, tortuous, narrow passages, the reader emerges in a tower. This is the ideal tower that haunts all dreamers of old houses: it is "perfectly
round" and there is "brief light" from a "narrow window" ... [it] stretches from earth to sky. It possesses the verticality of the tower rising from the most earthly, watery depths, to the abode of a soul that believes in heaven. Such a house, constructed by a writer, illustrates the verticality of the human being. 8

Few existing towers can rival such an imaginary tower, but some come much closer than others to achieving the vague, tacit concept of idealization. When describing the Eiffel Tower, Roland Barthes spoke of the great universal ascensional dream, or the "Babel complex" and claimed that it touched even greater depths than those associated with a theological project. The myth of Babel is idealistic, if only because it has been understood as a fantastic attempt to link the earth to the sky, the common dream Eliade refers to, the stairway or ladder to heaven, the passage from profane consciousness to absolute reality. The cathedral spire carries vestiges of such notions, attributions that only reinforce its symbolic role. The Eiffel Tower has the ability to attract a multitudonous number of meanings in a broad spectrum, at a variety of levels. Such flexibility makes it an accommodating image, readily adaptable to personal, more specific idealistic conceptions of what a tower should be. Frank Lloyd Wright's Mile High Skyscraper is an idealized image because it represents his perception of a utopia. Like Babel, it aims for the clouds. It revived the connection with the supra-mundane that disappeared after the construction of the last cathedral spire. It is also overambitious, not only in scale, but in its projection as an ideal city. Proof of its idealization is that it can only exist as a vision.
CONCLUSION

The transformations in meaning represented by themes relating to purpose, appearance and function can provide an illuminating understanding of the skyscraper of the present day. The appearance of the skyscraper has dramatically shifted in relationship to the appearance of towers of the past. Not only is it the highest, but also, with the exception of the Eiffel Tower, the most open tower. Internal density, often indicated on the exterior by the regulated placement of windows, is unrivalled by past towers. Urban agglomeration, or the condition that leads to the inability of the viewer to acknowledge a singular tower image on the skyline, occurred in medieval Italian towns, but the condition was an exceptional, transitory occurrence; few of these towers remain in existence today. Such a major change in appearance partially accounts for the change in meaning of the skyscraper.

The inclination towards tower building, when considered acceptable by a given milieu, can be attributed to both function and purpose. By denoting a common use, function can establish meaning, but it is purpose that provides richness and depth of meaning. Purpose considers characteristics common to human nature and focuses on their manifestation in the activity of tower building. Beginning with the construction of the first towers, varying emphasis has been placed on characteristics of meaning relating to purpose and function, and in all cases the motivation for tower building can be explained by either set of characteristics and in most cases varying degrees of both. Earlier towers designed for specific practical
uses, such as signaling and defense, often were constructed with consideration of larger purposes or acquired additional purposes with the passage of time; in this way their utilitarian value was de-emphasized. Though the Pharos at Alexandria was constructed as a fire beacon, it was also an exercise in attaining unprecedented height and a civic landmark that acquired later meaning as a symbol of a seaport. The Round Tower was designed specifically as a bell-house and defensive fortification, but its appearance and its role as a symbol of the Church were not accidental and just as important as pragmatic considerations. Romanesque campaniles had similar functions though, as shown at Pisa and at St. Mark's in Venice, where the campaniles played a critical role in the image of the city, landmark considerations demanded much greater attention than utilitarian concerns. The Gothic spire became almost useless as its symbolic or role as both an extension of the cathedral and the city increased. The tower at Fonthill was impractical regardless of its purpose as an observation platform. The Eiffel Tower was also useless, despite Eiffel's attempts to convert it to a functional structure after its construction. It was certainly not designed as a site for drop tests, or for testing physiological responses to height, or for supporting weather equipment. But the skyscraper is indubitably the most utilitarian of all towers. A direct response to the need for a larger amount of space on limited land area, the frame virtually instantly created space in urban locations where it was in highest demand. The characteristic of habitability reinforces the utilitarian image of commercial towers. Any structures that support human occupation for extended periods of time must be functional. Based on economic advantage, they
embody the implications that accompany the attitude behind the generation of the maximum amount of usable space for a given dollar value. Useful attributions such as these were blatantly evidenced in the Reliance Building.

However, many skyscrapers have displayed some of the characteristics of purpose and appearance intrinsic to earlier tower building during construction or have assumed these characteristics after completion. Though attention to characteristics of purpose and appearance have generally been subordinated to the pervasive demands of economic advantage, it is only when one realizes that tower building can mean more than the most efficient response to a given set of context-related conditions that the skyscraper begins to assume some of the meaning common to tower building of the past. The more cogently one of these characteristics is manifested, or the greater their number, the greater the depth and clarity of meaning the skyscraper assumes. If the exterior appearance of the skyscraper is sublime, if its interior is partially voided or transparent, its utilitarian quality is undermined, it becomes more like a "tower" in the sense that it possesses some of the qualities found originally and repeatedly in earlier towers. If a skyscraper becomes a marker in a competitive display, an observation platform, a landmark, or the framework for a skin that evokes associations with past towers and therefore associations with an established meaning, it becomes identified with traits that represent the essence of tower building. The Woolworth Building was constructed to meet utilitarian demands, but it also was part of the skyline competition in Manhattan and it legitimized the forces behind its construction with the sacred connotations of its skin. The soaring
delineation of its structure evoked the sublime. The Empire State Building was not only a winner in the skyline competition, but its streamlined Art Deco surfacing was advantageous to public acknowledgement and acceptability. It is a civic landmark, a symbol of Manhattan and has one of the loftiest observation decks in the city. When the skyscraper assumes context independent mythical or idealistic qualities, it can rival the meaning of towers of the past. The Empire State Building has become a popular myth because of its powerful conceptual image based on height and landmark status; the myth has been reinforced through popular media such as the postcard and the cinema. The Mile High Skyscraper was idealistic, because like Babel it aspired towards the ethereal, a seductive but impossible vision. Consequently, the overwhelming utilitarian emphasis of the skyscraper and its dramatically altered appearance invest it with a meaning that represents the most dramatic disjunction in the set of historical images that fall under the rubric "tower". It is only when it assumes characteristics of purpose and appearance with associations that are intrinsic to all tower building, characteristics established by their repeated occurrence during earlier historical frameworks, that it becomes first an acceptable image and perhaps, if warranted, transcends the condition of social fitness to enter the realm of the significant and the meaningful.
FOOTNOTES

INTRODUCTION


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FLORENCE: PALAZZO VECCHIO


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NEW YORK: THE EMPIRE STATE
AND WOOLWORTH BUILDINGS


8. S. Parkes Cadman, "Foreward", in *The Cathedral of Commerce*.


**FRANK LLOYD WRIGHT: MILE HIGH SKYSCRAPER**


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CONCLUSION


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**ROUND TOWERS**


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PISA: THE CAMPANILE


CITY FORTRESSES


**FLORENCE: PALAZZO VECCHIO**


BRUGES: THE BELFRY


STRASBOURG: THE SPIRE


**VILLA D'ESTE**


Fonthill Abbey


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