



PDHonline Course C724 (9 PDH)

Woolworth Building: Cathedral in the Clouds

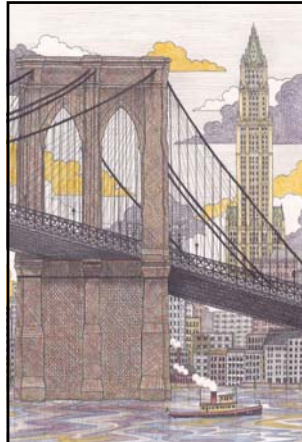
Instructor: Jeffrey Syken

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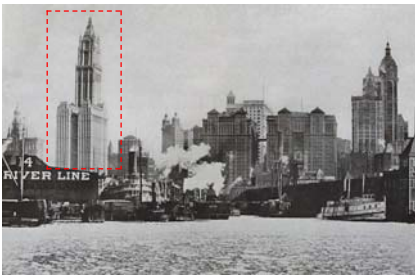
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"...Here, on the island of Manhattan, and at its southern extremity, stands a succession of buildings without precedent or peer. The vision of their grandiose effect from the Brooklyn Bridge at dusk, when the gathering darkness softens their bold outlines, and every one of the numberless windows coruscates with radiance, is beyond the brush of Turner to paint or the elegance of Ruskin to describe. It outvies imagination in its most fertile moments..."
 S. Parkes Cadman, D.D., S.T.D., L.H.D.
 RE: excerpt from the Foreword to "The Cathedral of Commerce" 7




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The Chosen Habitation

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"...Of these buildings the Woolworth is Queen, acknowledged as premier by all lovers of the city and the commonwealth, by critics from near and far, by those who aspire toward perfection, and by those who use visible things to attain it..."
 S. Parkes Cadman, D.D., S.T.D., L.H.D.
 RE: excerpt from the Foreword to "The Cathedral of Commerce" 10



"...When seen at nightfall bathed in electric light as with a garment, or 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, and reduces the hazards of war and bloodshed..."
 S. Parkes Cadman, D.D., S.T.D., L.H.D.
 RE: excerpt from the Foreword to "The Cathedral of Commerce" 11

Ecclesiastical Overtones

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"...there was no intention of making it anything like a cathedral, and in fact it bears no resemblance to a cathedral in the plan or exterior design or in any other respect. There are many medieval civic buildings to which it might be likened such as the Halls at Middleburg and Alkmaar in Holland, the City Hall in Brussels, the Hotel de Ville in Compiègne, the Cloth Hall at Ypres (destroyed in the Great War) and many others all of which have towers of proportionately great height although of course very much smaller than the Woolworth tower. All of them were studied, none were copied...It was my thought that since the building must have a tower, that there were quite enough examples to justify it among civic buildings regardless of ecclesiastical examples and that I must express the idea of a civic or commercial building rather than of an ecclesiastical one...At any rate, in the final development of the design the Woolworth tower stands on its merits; for I know of no prototype..."

Cass Gilbert, Architect

RE: from the moment Reverend S. Parkes Cadman christened the Woolworth Building the "Cathedral of Commerce" on opening day, there was, and remains to this day, the assumption that the building's design was based on ecclesiastical architectural references. Gilbert protested, claiming the design was strictly based on secular sources; in particular Gothic design's emphasis on verticality and FW's admiration for the Gothic Houses of Parliament. Despite his protests to the contrary, there are undeniable ecclesiastical overtones, particularly in the Lobby with its cruciform plan. The Arcade bears a strong likeness to a barrel-vaulted nave with a transept and the grotesques, triptychs and mosaic ceilings all add to the flavor of being in a medieval cathedral.

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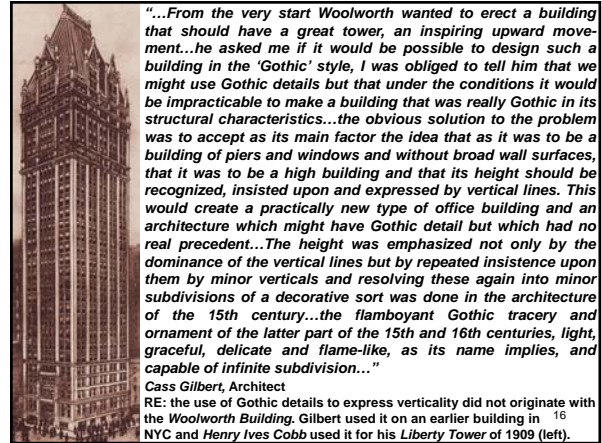
Upper Left: Alkmaar, Holland
Upper Right: Brussels City Hall

Lower Left: Hotel de Ville, Compiègne, France
Lower Right: Cloth Hall, Ypres

14



15



"...From the very start Woolworth wanted to erect a building that should have a great tower, an inspiring upward movement...he asked me if it would be possible to design such a building in the 'Gothic' style, I was obliged to tell him that we might use Gothic details but that under the conditions it would be impracticable to make a building that was really Gothic in its structural characteristics...the obvious solution to the problem was to accept as its main factor the idea that as it was to be a building of piers and windows and without broad wall surfaces, that it was to be a high building and that its height should be recognized, insisted upon and expressed by vertical lines. This would create a practically new type of office building and an architecture which might have Gothic detail but which had no real precedent...The height was emphasized not only by the dominance of the vertical lines but by repeated insistence upon them by minor verticals and resolving these again into minor subdivisions of a decorative sort was done in the architecture of the 15th century...the flamboyant Gothic tracery and ornament of the latter part of the 15th and 16th centuries, light, graceful, delicate and flame-like, as its name implies, and capable of infinite subdivision..."

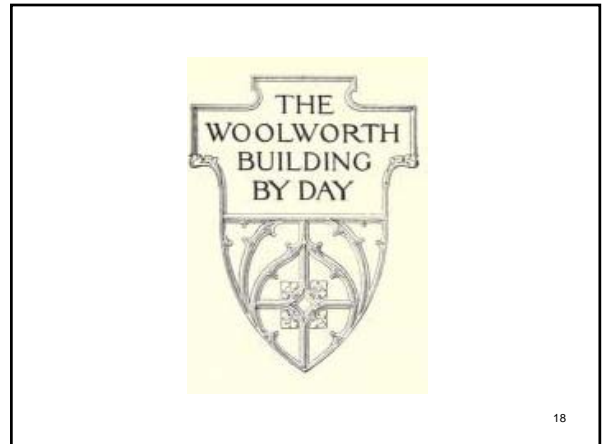
Cass Gilbert, Architect

RE: the use of Gothic details to express verticality did not originate with the Woolworth Building. Gilbert used it on an earlier building in NYC and Henry Ives Cobb used it for his Liberty Tower of 1909 (left).

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By Day, By Night

17

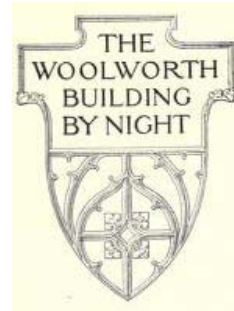


18



"The loftiest and most beautiful building in all the world dedicated to commerce – seen through the great arch of the Municipal Building in the soft glow of early morning sunlight."

RE: excerpt from the Foreword to "The Cathedral of Commerce" 19

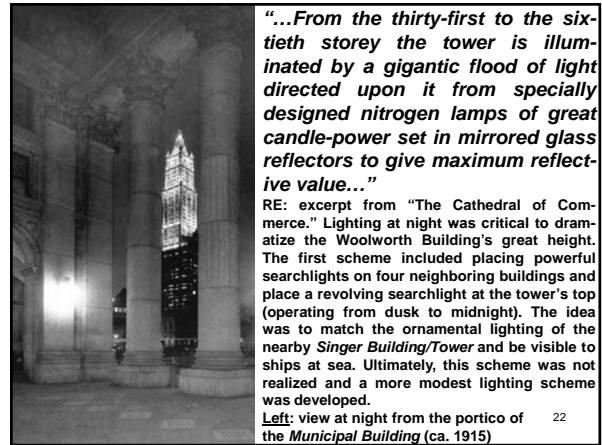


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"At dusk, its gigantic Tower, bathed in electric light of many gorgeous hues, rises high into the heavens like a shaft of fire heralding the approach of night."

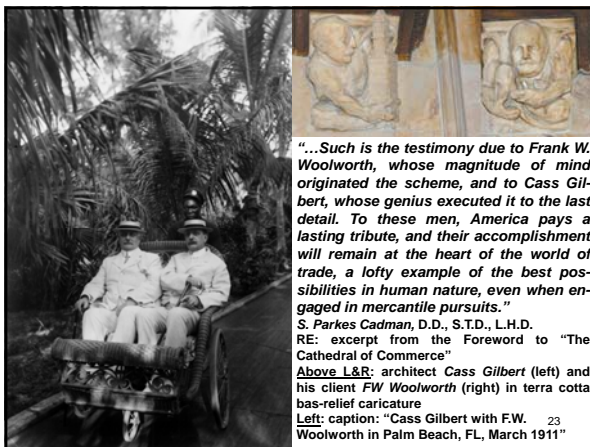
RE: excerpt from the Foreword to "The Cathedral of Commerce" 21



"...From the thirty-first to the sixtieth storey the tower is illuminated by a gigantic flood of light directed upon it from specially designed nitrogen lamps of great candle-power set in mirrored glass reflectors to give maximum reflective value..."

RE: excerpt from "The Cathedral of Commerce." Lighting at night was critical to dramatize the Woolworth Building's great height. The first scheme included placing powerful searchlights on four neighboring buildings and place a revolving searchlight at the tower's top (operating from dusk to midnight). The idea was to match the ornamental lighting of the nearby Singer Building/Tower and be visible to ships at sea. Ultimately, this scheme was not realized and a more modest lighting scheme was developed.

Left: view at night from the portico of the Municipal Building (ca. 1915) 22

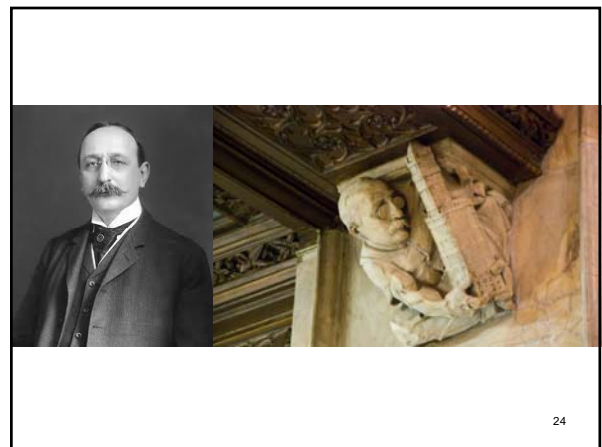


"...Such is the testimony due to Frank W. Woolworth, whose magnitude of mind originated the scheme, and to Cass Gilbert, whose genius executed it to the last detail. To these men, America pays a lasting tribute, and their accomplishment will remain at the heart of the world of trade, a lofty example of the best possibilities in human nature, even when engaged in mercantile pursuits."

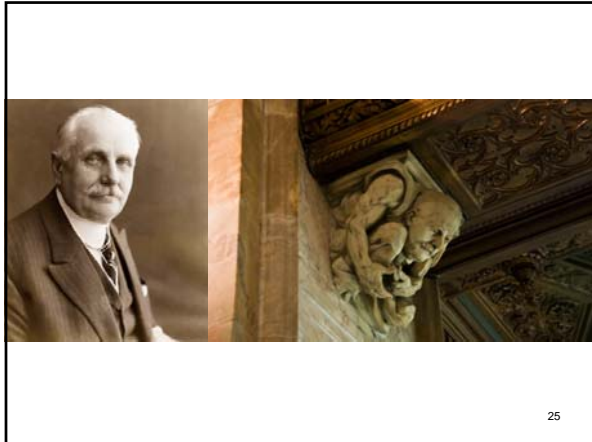
S. Parkes Cadman, D.D., S.T.D., L.H.D.
RE: excerpt from the Foreword to "The Cathedral of Commerce"

Above L&R: architect Cass Gilbert (left) and his client FW Woolworth (right) in terra cotta bas-relief caricature

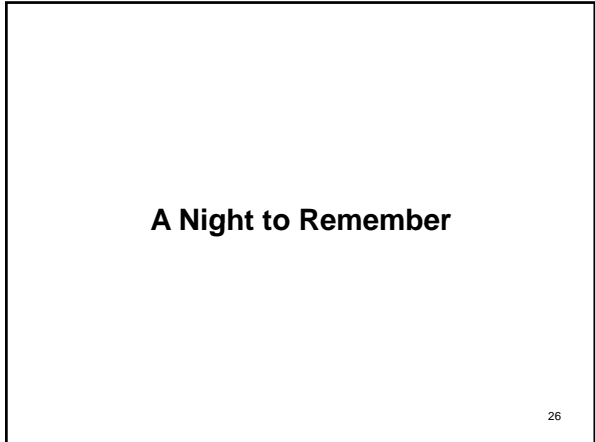
Left: caption: "Cass Gilbert with F.W. Woolworth in Palm Beach, FL, March 1911" 23



24



25



26

"On the night of April 24, 1913, President Wilson pressed a tiny button in the White House and 80,000 brilliant lights instantly flashed throughout the Woolworth Building. The event marked the completion, the dedication and the formal opening of that regal edifice, the tallest and most beautiful building in all the world erected to commerce, so judged by the officials of the Panama-Pacific Exposition when they placed their seal of approval upon it and awarded it a gold medal..."

RE: excerpt from "The Cathedral of Commerce"

Left: official award ribbon from the Panama-Pacific International Exposition in San Francisco, 1915 for the "Highest and Finest Office Building in the World"

27

55-STORY BUILDING
OPENS ON A FLASH

Woolworth Skyscraper Lights Up and Big Dinner Starts on Signal from White House.

President Wilson, from the White House in Washington, gave the signal for the formal opening of the new Woolworth Building last night, the tallest structure in the world, with the one exception of the Eiffel Tower in Paris.

28

"President Wilson, from the White House in Washington, gave the signal for the formal opening of the new Woolworth Building last night, the tallest structure in the world, with the one exception of the Eiffel Tower in Paris. At 7:29, when 900 guests, who had been invited by the owner, Frank W. Woolworth, to a dinner in honor of the architect, Cass Gilbert, were seated at the tables...a telegrapher notified the operator in the White House that all was ready for the president to press the button. One minute later President Wilson touched the instrument closing the circuit...and for the first time lights flashed from every floor of the fifty-five stories, from the sub-basement, 37-feet below the street, to the top of the tower, 792 feet above the street."

The New York Times, April 25th 1913

29

"...burst forth from the black night one giant shaft of uniform light crowned with a great scintillating jewel...the greatest permanent lighting spectacle in the world"

World's Advance, January 1st 1914

RE: illumination of the building at night was inaugurated on New Year's Eve 1914 (left). Floodlights equaling twelve million foot-candles washed evenly across the facade while at the lantern at the tower's pinnacle twenty 1K-watt lamps created "an immense ball of fire."

30



"...It was a memorable night. A profusion of light filled the twenty-seventh floor, which had been arranged for a superb banquet. And assembled there, was a great host of statesmen, captains of industry, merchants, journalists, scholars, poets – all representative Americans, proud to break bread with and honor the man who had realized his dream and the gallant aides who tirelessly had labored with him to accomplish the stupendous task, the up-building of a monument to small things..."

RE: excerpt from "The Cathedral of Commerce" 31
Above: caption: "Woolworth Building Opening Banquet, April 24, 1913"



"I asked his bankers about it and they told me that the Woolworth Building is a structure unique in New York, since it stands without mortgage and without a dollar of indebtedness."

Cass Gilbert, Architect
RE: excerpt from his banquet speech
Above & Left: caption: "Tiffany & Co. Presentation punch bowl commemorating the opening of the F.W. Woolworth Building, 1913. Sterling silver with gold inscription" 32

An Absolute Necessity

33

World Trade Center, 1975	1,350' (414 meters)
Empire State Building, 1931	1,250' (375 meters)
Chrysler Building, 1930	1,048' (314 meters)
40 Wall Street Building, 1929	927' (278 meters)
Woolworth Building, 1913	792' (237 meters)
Metropolitan Life Building, 1909	680' (204 meters)
Singer Building, 1908	615' (184 meters)
World (Pulitzer) Building, 1890	375' (112 meters)
Tower Building, 1889	120' (36 meters)

"...The rapid development of New York City during the past half-century is almost inconceivable, and land has become so precious – especially downtown in the radius of the City Hall, the Post Office, the Treasury, the Clearing House and the Stock Exchange – that in order to make room for the business population, lofty buildings have become an absolute necessity... Since the dawn of the twentieth century steel frames in construction have been brought to greater perfection and are protected from moisture and rust by preservatives. The confidence of capitalists seems to have no limit in building construction and there even appears to be some sort of rivalry in the projection of steel and stone towards the clouds. The most attractive examples of tall buildings today are the Times Building; the Metropolitan, 700 feet above curb; the City Investing Building, 500 feet; the Singer Building; 612 feet; the Municipal Building, 560 feet; and the greatest and noblest of all, the Woolworth Building, 785 feet above the sidewalk..."

RE: excerpt from "The Master Builders"
Left: a graphic comparison of NYC's skyscraper evolution starting with the Tower Building of 1889 through to the WTC 34


The Palm for Height

35


	Woolworth Building	Singer Building	Metropolitan Tower
Height (in ft.)	792	615	680
Number of Stories	33	46	50
Total Weight	10,000,000 lbs.	16,000,000 lbs.	17,000,000 lbs.
Floor Area	42,000	41,000	41,000
Number Electric Lights	80,000	14,000	10,000
Miles of Plumbing	21	18	13
Number of Elevators	28	10	15
Combined Weight of Elevator Shafts	2 million	12 million	11 million

"In our opinion, at least so far as New York is concerned, it is doubtful if the palm for height is ever wrested from the Woolworth Building. It marks, to my mind, the end of the rivalry in skyscrapers which has received fresh impetus from the City Investigating, Singer, Metropolitan Life, and Banker's Trust buildings in turn."


Real Estate magazine, 1912
Above: caption: "A comparison of the three great towers of New York is interesting as showing the remarkable progress made year by year in the development of the skyscraper"
Left: caption: "The Longest Ship and the Tallest Building. The 'Imperator,' 36 900 feet; Woolworth Building, 750 feet" 36



“...I called Mr. Woolworth’s attention to the height of the Woolworth tower as being somewhat higher than previously sketched. He inquired as to its comparative height with the Singer tower and instructed me to increase the height so as to make it 620 ft. above the sidewalk...”
 Cass Gilbert, Architect (November 1910)
 RE: initially, FW planned for a standard twelve to sixteen story office building on the corner of Broadway and Park Place, comprising only a portion of the eventual site. However, the idea of surpassing neighboring tall buildings would change these plans many times. The first change in plans was an increase in height to twenty-stories in order to make the building taller than the World (a.k.a. Pulitzer) Building on Park Row (left) – on the east-side of City Hall Park. By September 1910, the revised design called for a twenty-five-story base supporting a forty-story tower on its eastern frontage. Rising about 550-feet (Gilbert left the final height to-be-determined), the building site would extend 105-feet along Broadway and 197-feet 9-inches along Park Place. By November 1910, FW determined to go higher than architect Ernest Flagg’s Singer Tower of 1907 which rose to a height of 612-feet on a site just south of FW’s. That month, it was announced publicly that the building would rise forty-five-stories to a height of 625-feet on its corner site. However, there remained the Metropolitan Life Insurance Tower on Madison Square Park. Completed in 1908 by the architectural firm of Napoleon LeBrun & Son, it held the title of world’s tallest building at 700 feet 2-inches. FW began to think he had not gone high enough. 37




On January 20th 1907, *The World Magazine* pictured an assembly of NYC’s tallest towers, packed into the space surrounding Trinity Church on lower Broadway at Wall Street. A key (in the lower-left corner) identifies the structures, including the newspaper’s own headquarters - the *World Building* (at far right, with dome) which was the world’s tallest office building from 1890 until the completion of the *Park Row Building* in 1899. At the time of the article entitled: “How Far Can New York Climb into the Sky,” the two tallest buildings pictured; the *Singer Tower* and the *Metropolitan Life Insurance Tower*, were under construction (former) and/or proposed (latter). 38



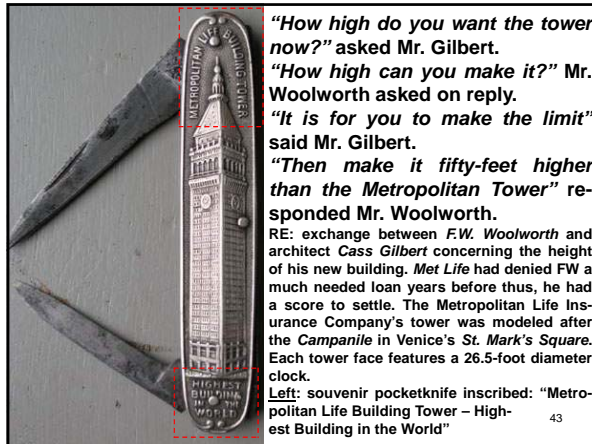
The three highest Buildings of the World, New York.
 1910
 1907
 1908
 39

“There is no legal limit to the height of buildings now, and so far as I can see, there is no need for any such limit. Just so long as builders comply with all the regulations of the departments controlling the size and depth of the foundations they can go on raising their structures in the air until they more than double their present height. The 100-story building I believe to be not only possible, but practicable. Certainly on all grounds of safety there will not be any objection to a structure of that height. To prophesy for the future a little, it seems to me that the era of tall buildings has just begun. Tall as the forty-six-story building to be built by the Metropolitan Life Insurance Company may seem at present, I am positive we shall often see it equaled, beaten and perhaps actually doubled in size.”
 Edward S. Murphy, Superintendent of Buildings (ca. 1907) 40



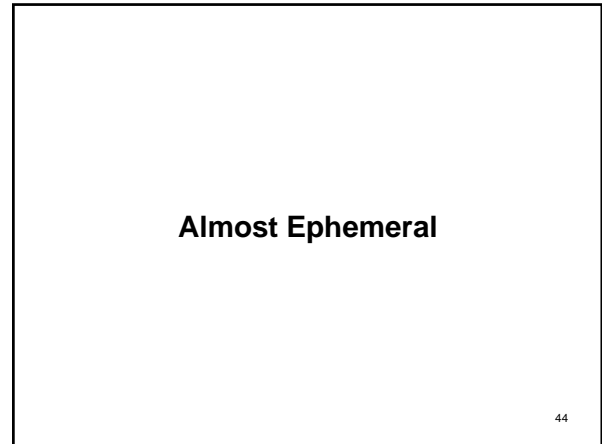
“You and your directors were well advised in the choice of your symbol. For a tower, with its light and its belfry, has always been a source of inspiration...Thus your tower partakes of the character of the ancient towers of refuge and defense...Your high tower should, therefore, be a symbol of God to you and others, standing out boldly and erect as a plea for righteousness and purity in business corporations, and as a monumental protest against the exploitation of the poor”
 RE: correspondence to Metropolitan Life Insurance Company stockholders concerning their new skyscraper
 Left: caption: Metropolitan Life Building – The Tallest Building in the World, 48 Stories” 41

“...Woolworth remarked that there was no use in making the tower 625 ft. unless it went up high enough to be the highest tower in the world and he spoke of 710 ft. or 712 ft. as being the alternative. He continued to advocate the higher tower on the grounds that it would be the greatest tower in the world and yet he was not finally determined upon doing it. He seemed unable to make up his mind...”
 Cass Gilbert, Architect (December 1910) 42



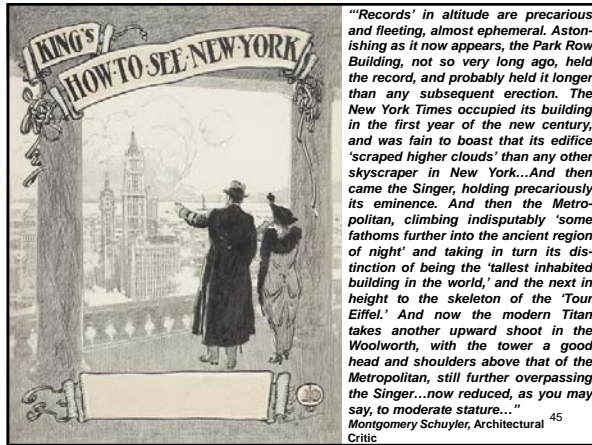
“How high do you want the tower now?” asked Mr. Gilbert.
“How high can you make it?” Mr. Woolworth asked on reply.
“It is for you to make the limit” said Mr. Gilbert.
“Then make it fifty-feet higher than the Metropolitan Tower” responded Mr. Woolworth.
 RE: exchange between *F.W. Woolworth* and architect *Cass Gilbert* concerning the height of his new building. *Met Life* had denied FW a much needed loan years before thus, he had a score to settle. The Metropolitan Life Insurance Company’s tower was modeled after the *Campanile* in Venice’s *St. Mark’s Square*. Each tower face features a 26.5-foot diameter clock.
 Left: souvenir pocketknife inscribed: “Metropolitan Life Building Tower – Highest Building in the World”

43



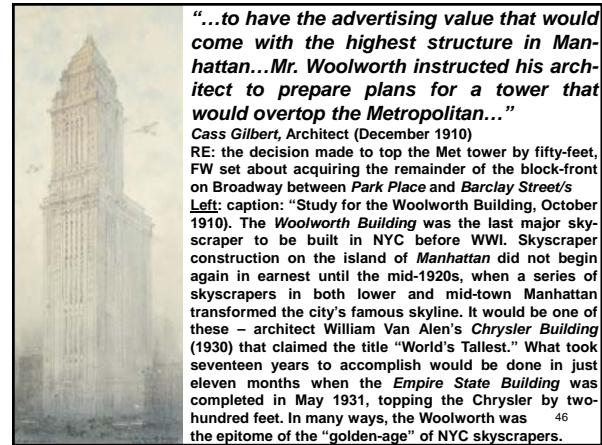
Almost Ephemeral

44



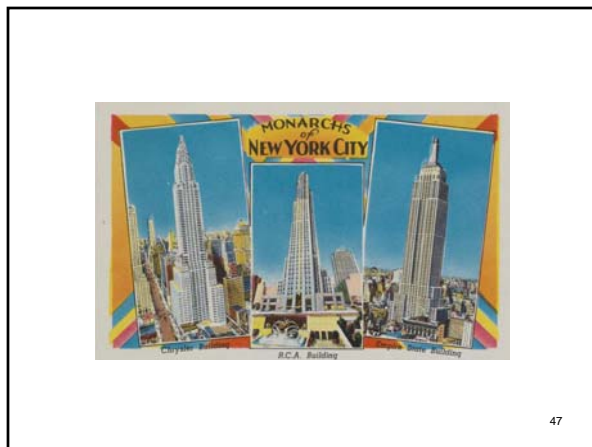
“Records’ in altitude are precarious and fleeting, almost ephemeral. Astonishing as it now appears, the Park Row Building, not so very long ago, held the record, and probably held it longer than any subsequent erection. The New York Times occupied its building in the first year of the new century, and was fain to boast that its edifice ‘scraped higher clouds’ than any other skyscraper in New York...And then came the Singer, holding precariously its eminence. And then the Metropolitan, climbing indisputably ‘some fathoms further into the ancient region of night’ and taking in turn its distinction of being the ‘tallest inhabited building in the world,’ and the next in height to the skeleton of the ‘Tour Eiffel.’ And now the modern Titan takes another upward shoot in the Woolworth, with the tower a good head and shoulders above that of the Metropolitan, still further overpassing the Singer...now reduced, as you may say, to moderate stature...”
 Montgomery Schuyler, Architectural Critic

45



“...to have the advertising value that would come with the highest structure in Manhattan...Mr. Woolworth instructed his architect to prepare plans for a tower that would overtop the Metropolitan...”
 Cass Gilbert, Architect (December 1910)
 RE: the decision made to top the Met tower by fifty-feet, FW set about acquiring the remainder of the block-front on Broadway between *Park Place* and *Barclay Street*/s
 Left: caption: “Study for the Woolworth Building, October 1910). The *Woolworth Building* was the last major skyscraper to be built in NYC before WWI. Skyscraper construction on the island of *Manhattan* did not begin again in earnest until the mid-1920s, when a series of skyscrapers in both lower and mid-town Manhattan transformed the city’s famous skyline. It would be one of these – architect *William Van Alen*’s *Chrysler Building* (1930) that claimed the title “World’s Tallest.” What took seventeen years to accomplish would be done in just eleven months when the *Empire State Building* was completed in May 1931, topping the Chrysler by two-hundred feet. In many ways, the Woolworth was the epitome of the “golden-age” of NYC skyscrapers.

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“...The Times Tower, the Singer Tower, the Banker’s Trust, the Municipal Building, the Metropolitan Life, and now this soaring Woolworth are undoubtedly among the most interesting of our experiments in skyscraping...”
 Montgomery Schuyler, Architectural Critic
 Left: caption: “New York City as it Will be in 1999, The New York World, December 30, 1900, supplement foldout. Illustrator: *Louis Biedermann*”

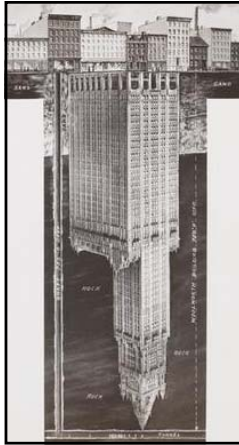
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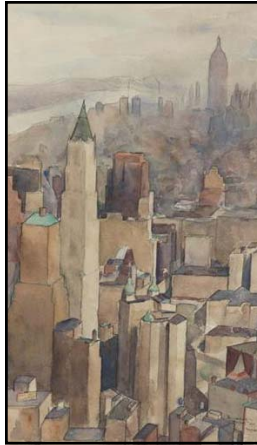
“...The Woolworth Building reaches a height of 784 feet above the sidewalk. Its sub-basement floor is 37.6 feet below the level of the street, and the concrete and steel caissons upon which it rests extend to bedrock, 130 feet below the surface. No other building in modern or ancient times has reached such a height as 910 feet, the extreme height of the Woolworth Building, from where it sits on bedrock to the top of the tower. The Eiffel Tower alone exceeds it in height, but the Eiffel Tower is not a building. The Tower of Babel – scientists tell us – reached a height of about 680 feet before the builders got mixed in their tongues and gave it up as a bad job...”
 RE: excerpt from “Above the Clouds and Old New York” 49

Quot Homines, Tot Sententiae

50



“...among real estate speculators, among architects, among engineers, you will find a new opinion with every new expert you ask. ‘Quot homines, tot sententiae.’ Possibly the Woolworth may retain its pre-eminence for a decade, possibly it may lose it next year. The sudden upstart of Jonas’ gourd or Jack’s beanstalk is nothing to the swiftness of these latter uprisings. They shoot up ‘while you wait.’...”
 Montgomery Schuyler, Architectural Critic
 Left: caption: “Deepest City Tunnel Shaft Compared With Height of Woolworth Building (Catskill System).” Translation of Quot homines, tot sententiae: “There are as many opinions as there are men.” 51




“The owners of the building have numbered the pipe galleries and they now call the building 60 stories high.”
 New York Historical Society, 1920
 RE: In June 1914, Cass Gilbert employed a surveyor to measure the tower’s height from five different sidewalk locations, yielding an average height of 792 feet 5.5 inches. The completion of the Woolworth Building marked the end, temporarily at least, of the “Race to the Sky” on Manhattan island. It would be taken up again in earnest during the economic boom years of the “Roaring ‘20s,” when “Captains of Industry” (i.e. Walter P. Chrysler) vied for the title: “World’s Tallest Building.” These post-WWI skyscrapers would abandon the historically derived forms used by Cass Gilbert and his contemporaries in favor of more modern styles (i.e. Art Deco). Though the vocabulary of the “romantic” skyscraper had changed, the language established by the Woolworth Building was in evidence in tall, slender towers and their emphasis on verticality and symbolic ornamentation. This fact was recognized when, in 1931, Cass Gilbert was awarded a gold medal by the Society of Arts and Sciences for the Woolworth Building’s everlasting contribution to skyscraper design. 52



The Woolworth Building occupies the entire block-front along the western side of Broadway, between Park Place and Barclay Street. The 30-storey tower rises above a 30-storey base which contains three unbroken elevations; on Broadway, Park Place and Barclay Street. The tower meets the lot line on Broadway, but is narrower than the base and does not extend as far west. The tower contains two setbacks thereby creating three sections which diminish in size as the tower ascends skyward, culminating in a pyramidal roof flanked by four ornate, “Tournelles.” Both the tower and base elevations are divided into vertical bays of windows and spandrels. 53


The Highest Standard

54




"...Yes, as a commercial institution the Woolworth Building is preeminent. Within its walls are housed great banking institutions, the executive and clerical staffs of giant industries, the New York representatives of America's big business enterprises and a great many leaders in the professions. Its tenants, with their employees, number 12,000 people – the population of a city – and only tenants of the highest standard are accepted. The Building could have been filled twice over had not Mr. Woolworth been so strict about the responsibility and personal integrity of every lessee. Altogether, these tenants rank among our country's most prosperous, most progressive and most reputable business and professional men..."

RE: excerpt from "The Cathedral of Commerce" 55



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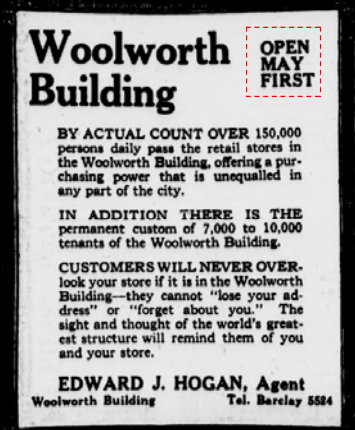
The Broadway-Park Place Co. was able to tell prospective tenants unhesitatingly that no expense had been spared in creating the building, making for a prestigious corporate address. This helped attract large corporations as tenants. The Columbia Recording Co. was among the first to take space. Many of its early Gramophone records had the building's address (233 Broadway) on their label. Columbia's publicity dept. informed customers that the stone-walled studios on the ground floor had "unrivalled acoustics." Gramophone records, like this 5.5-inch "Little Marvel" at left, were produced for the F.W. Woolworth Co. exclusively.

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"...You can deposit and draw money at the bank on the first floor; in the basement there are barber shops and a swimming pool, one of the largest in New York...There is an arcade lined with attractive shops whose fronts are entirely of plate glass. Then there is a luncheon club, library and gymnasium on the 28th floor and an observatory station on the roof..."

RE: excerpt from a Woolworth Building promotional brochure (1913)
 Left T&B: caption: "Woolworth Building, storefronts on Barclay Street and Broadway, January 8, 1913" 59



Woolworth Building **OPEN MAY FIRST**

BY ACTUAL COUNT OVER 150,000 persons daily pass the retail stores in the Woolworth Building, offering a purchasing power that is unequalled in any part of the city.

IN ADDITION THERE IS THE permanent custom of 7,000 to 10,000 tenants of the Woolworth Building.

CUSTOMERS WILL NEVER OVERLOOK your store if it is in the Woolworth Building—they cannot "lose your address" or "forget about you." The sight and thought of the world's greatest structure will remind them of you and your store.

EDWARD J. HOGAN, Agent
 Woolworth Building Tel. Barclay 5524

Left: advertisement for retail space in the Woolworth Building appearing in the *Evening World* on April 24th 1913 (the ceremonial opening day) In fact, tenant leases began on May 1st 1913, the traditional date for the beginning of tenant leases, at the time.

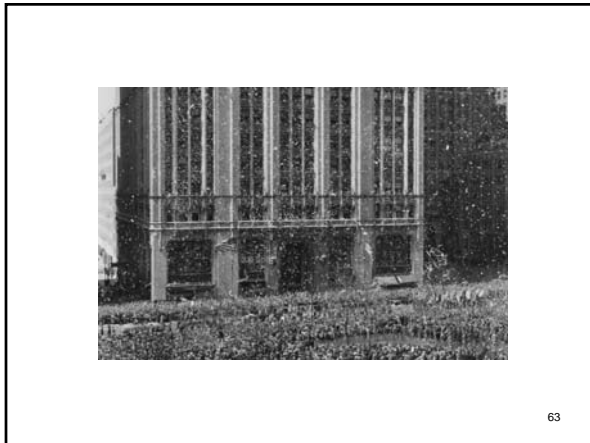
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63

To the Delight of Prospective Tenants

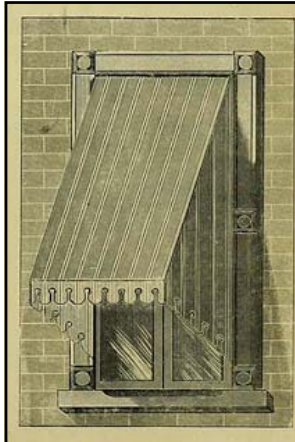
64



“...Awnings have not been common on the windows of office buildings. The piercing rays of the sun on a July or August day, high up above the buildings roundabout, necessitated some reliable protection, and since the friendly awning will permit the cooling breezes to blow in while it shades the occupant of the room, it was thoughtfully adopted. The important consideration was to have wrought iron frames built strong enough to resist the wind pressure, even to the fiftieth story and above, but this was a matter of design and specification together with the color and texture of the cloth. Everything, even to the shade of the cloth for the awnings of the Woolworth Building, was to be in harmony...”
 RE: excerpt from “The Master Builders”
 Left: caption: “Tribune Tower, Chicago, ca. 1930. Note window awnings.” 65

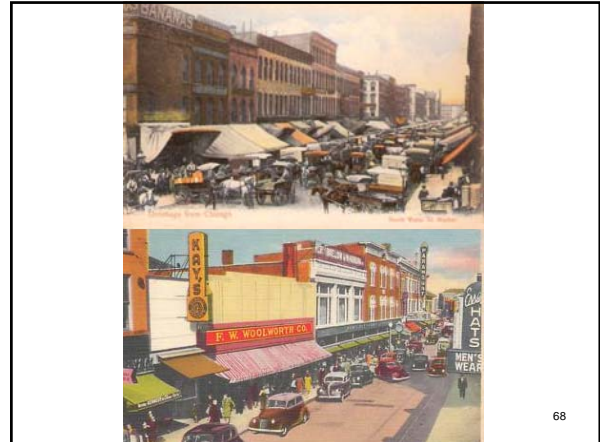


“...No doubt the architect had remembered the gay and beautiful awnings of the homes and hotels, and those of Spain and other countries where the rays of the sun are not productive of comfort on a mid-summer day; anyhow his knowledge even about awnings proved to be equal to the requirements of the building and the delight of prospective tenants...”
 RE: excerpt from “The Master Builders”
 Above: cover of an Otis Awning Fabrics Company brochure, ca.1920s 66



Throughout their two-century history, awnings (along with drapes, curtains, shutters and blinds) provided natural climate control in an age before air-conditioning and/or tinted glass. By blocking out the sun's rays while admitting daylight and allowing air to circulate between interior and exterior, they were remarkably efficient and cost effective. Awnings permitted window-shopping on rainy days and protected show window displays from fading due to sunlight. On the primary facade, they were central to a building's appearance. Manufacturers came up with attractive awnings featuring distinctive stripes, ornate valances and painted lettering and logos. With a wide range of color and pattern choices, owners and architects could select awnings that complemented the building aesthetically.

Left: caption: "Catalog Illustration, Window Awning, 1882" 67

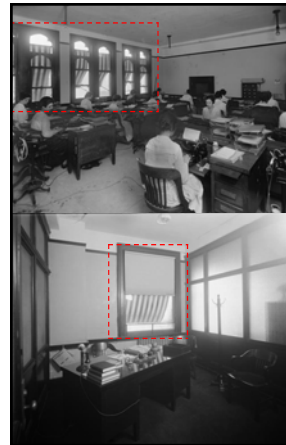


68



Awnings became a common feature in the years after the American Civil War. Iron plumbing pipe, which was quickly adapted for awning frames, became widely available and affordable as a result of the industrial revolution. It was a natural material for awning frames; easily bent and threaded together to make a range of different shapes and sizes. At the same time, the decline of the Age of Sail in favor of the Age of Steam forced canvas mills and sail makers to search for new markets. Thus, a vibrant awning industry developed offering an array of frame and fabric options adaptable to both storefronts and windows.

69

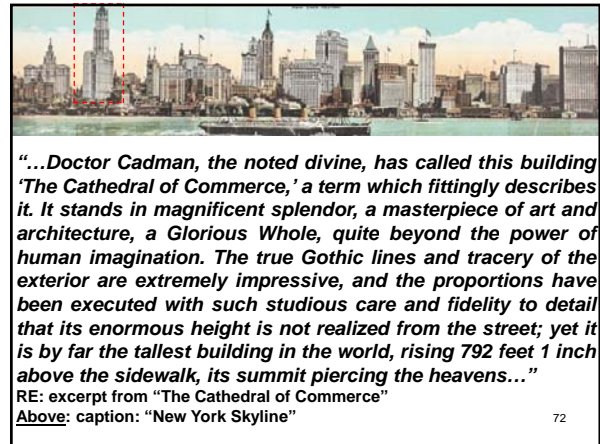


"...The shape and strength of the frames was demanded by the tremendous wind pressure which would certainly be met with, but the matter of cloth, what its texture, shade and color were to be the artist had to decide...undoubtedly the tan color stripe harmonizes with the color scheme of the building, and what is of equal importance, it will not fade or change by rain or atmosphere action. The cloth is the best that can be manufactured, and John Boyle and Company, Inc., the manufacturers, are to be congratulated for their success in supplying such excellent material, which certainly cannot be excelled for its lasting quality and general suitability..."

RE: excerpt from "The Master Builders" Left T&B: awnings in the windows of a Woolworth Building tenant's office 70

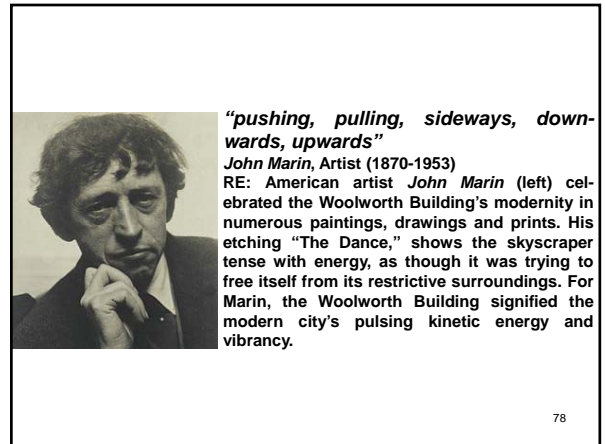
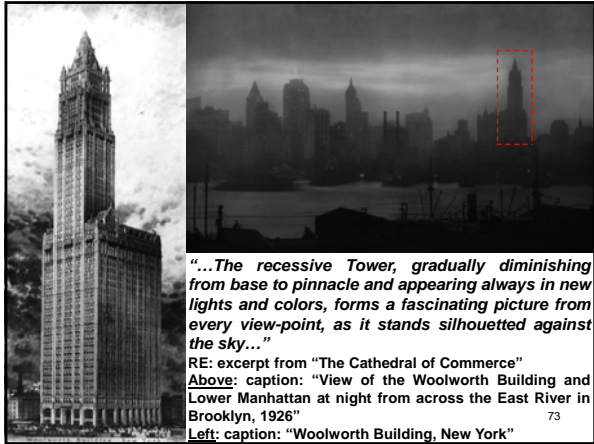
A Glorious Whole

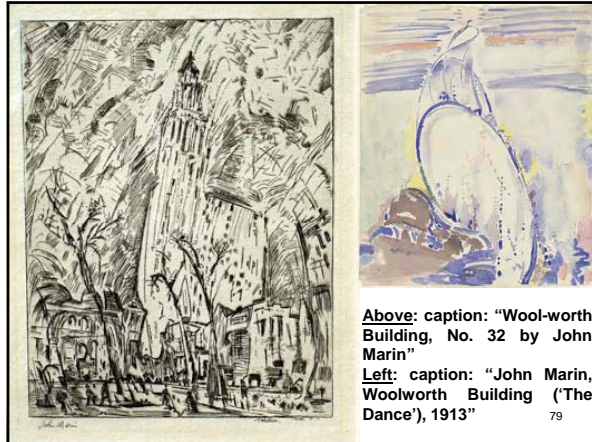
71



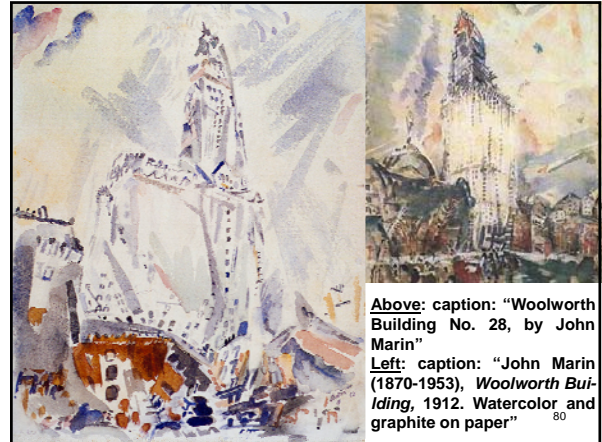
"...Doctor Cadman, the noted divine, has called this building 'The Cathedral of Commerce,' a term which fittingly describes it. It stands in magnificent splendor, a masterpiece of art and architecture, a Glorious Whole, quite beyond the power of human imagination. The true Gothic lines and tracery of the exterior are extremely impressive, and the proportions have been executed with such studious care and fidelity to detail that its enormous height is not realized from the street; yet it is by far the tallest building in the world, rising 792 feet 1 inch above the sidewalk, its summit piercing the heavens..."

RE: excerpt from "The Cathedral of Commerce" Above: caption: "New York Skyline" 72

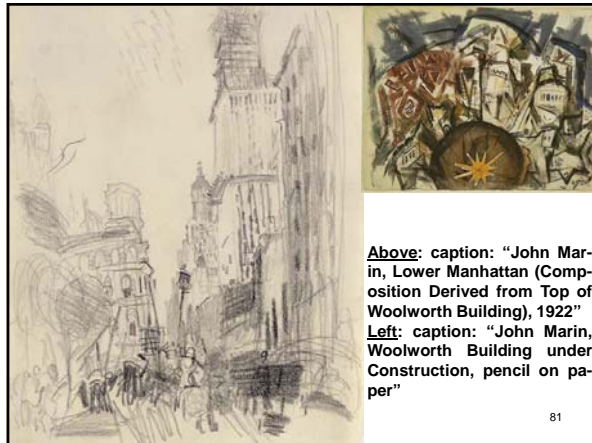




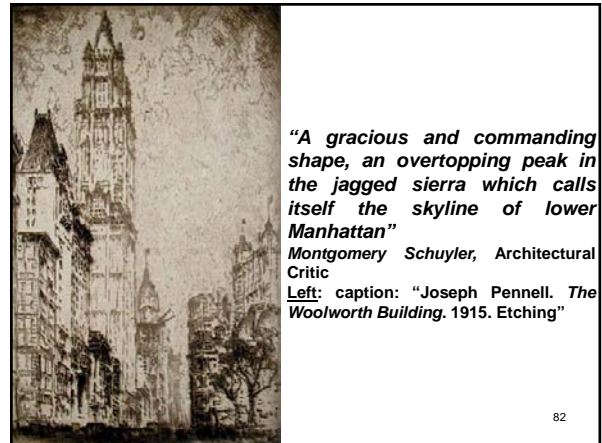
Above: caption: "Woolworth Building, No. 32 by John Marin"
Left: caption: "John Marin, Woolworth Building ('The Dance'), 1913"
 79



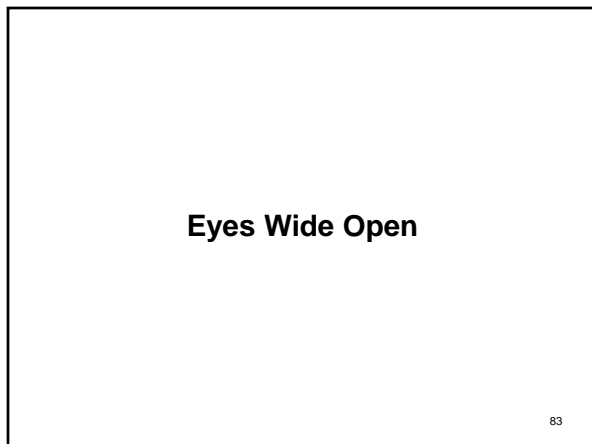
Above: caption: "Woolworth Building No. 28, by John Marin"
Left: caption: "John Marin (1870-1953), Woolworth Building, 1912. Watercolor and graphite on paper"
 80



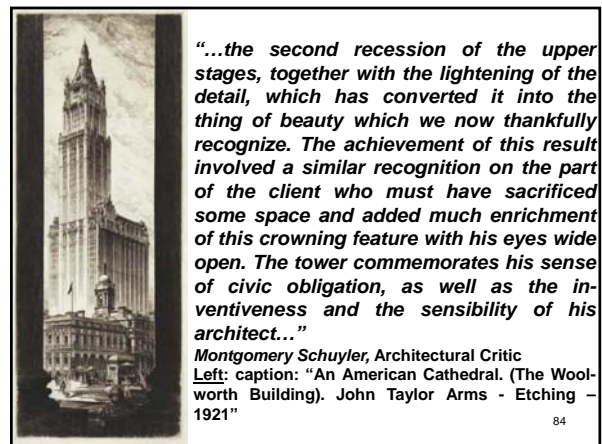
Above: caption: "John Marin, Lower Manhattan (Composition Derived from Top of Woolworth Building), 1922"
Left: caption: "John Marin, Woolworth Building under Construction, pencil on paper"
 81



"A gracious and commanding shape, an overtopping peak in the jagged sierra which calls itself the skyline of lower Manhattan"
 Montgomery Schuyler, Architectural Critic
Left: caption: "Joseph Pennell. The Woolworth Building. 1915. Etching"
 82



Eyes Wide Open



"...the second recession of the upper stages, together with the lightening of the detail, which has converted it into the thing of beauty which we now thankfully recognize. The achievement of this result involved a similar recognition on the part of the client who must have sacrificed some space and added much enrichment of this crowning feature with his eyes wide open. The tower commemorates his sense of civic obligation, as well as the inventiveness and the sensibility of his architect..."
 Montgomery Schuyler, Architectural Critic
Left: caption: "An American Cathedral. (The Woolworth Building). John Taylor Arms - Etching - 1921"
 84



“The world’s opinion of the American Architecture will be entirely different from now on”
Matusnosuke Moriyama, Architectural Historian
Left: caption: “New York Street Corner With Wool-worth Building, ca. 1913. Etching”

85



“From up or down Broadway, at any point which enables the observer to get the silhouette or the demi-silhouette in its due outline and detachment, how satisfactory and eye filling it is”
Montgomery Schuyler, Architectural Critic
Left: caption: “Broadway and Woolworth Building, New York, 1928”

86



“It is an epoch-making work, one of the classics of its kind”
Andre Michel, Architectural Historian
Left: caption: “Woolworth Building, New York, etching by William C. McNulty – American (1889-1963), 1929”

87



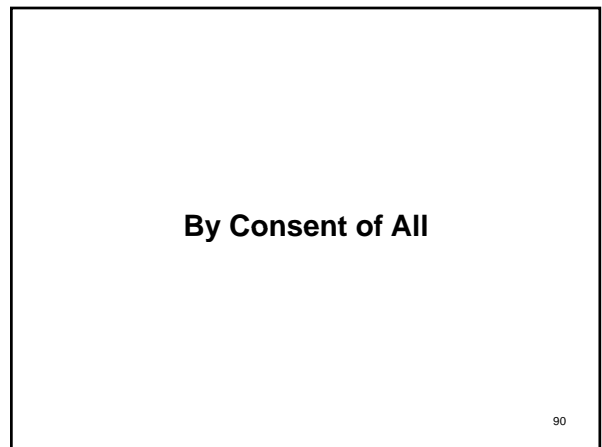
Above: caption: “In Harmony, Woolworth Building”
Left: caption: “Woolworth Building – Watercolor”

88



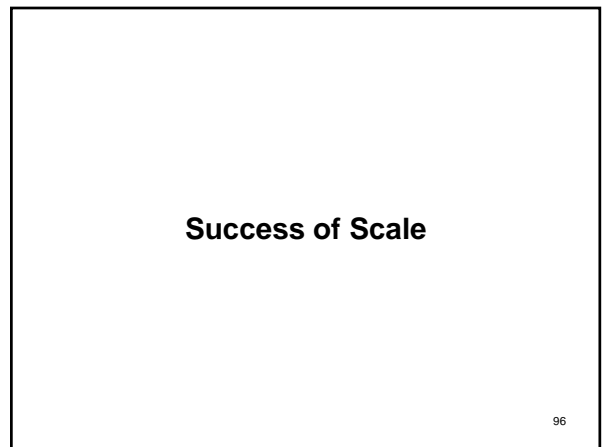
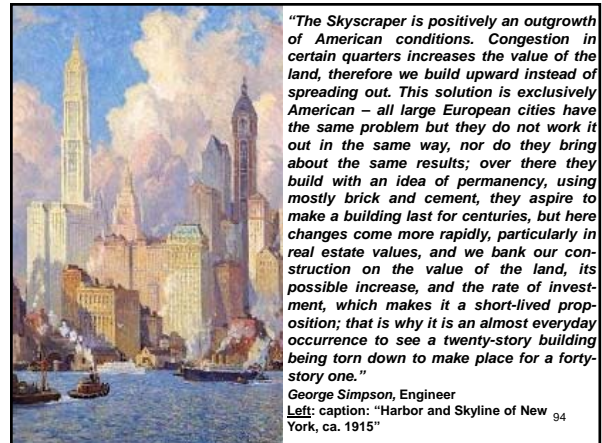
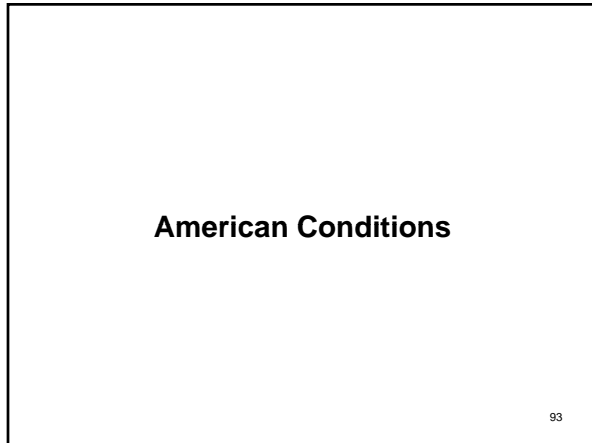
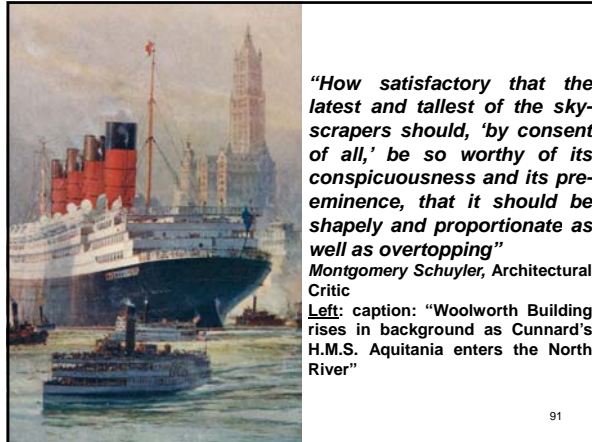
“it is an ornament of our city and a vindication of our artistic sensibility, of our use of the opportunities thrust upon us by the exigencies of our commercial building, and of the meeting of them by our strange new mechanical devices”
Montgomery Schuyler, Architectural Critic
Left: caption: “Woolworth Building – June Night”

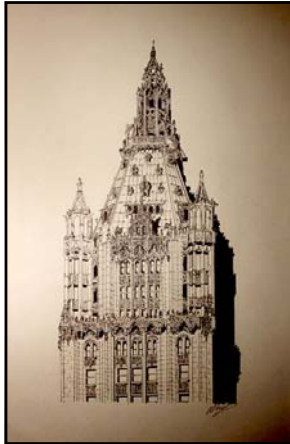
89



By Consent of All

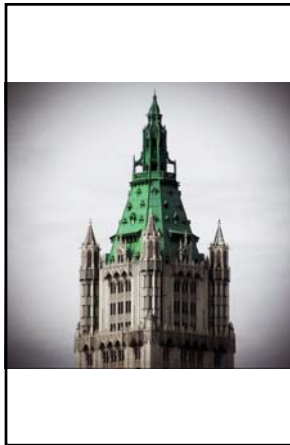
90





"...One of the chief successes, all will agree, is its success of 'scale'...The 'man in the street' can hardly help observing the distinctness and sharpness of the outlines of the canopies and arcades so many hundred feet above him...It includes consideration of projections and recessions, of depths and detachments, of lights and shadows. One perceives also the effect of the color applied to the plane surfaces. As color it hardly counts from below, but as a means of detachment and clarification it counts emphatically in the distant view. And in the near view, take such a feature as the doubled window at the angle, with that grotesque gargoyle - from Notre Dame de Paris, is it?..."
 Montgomery Schuyler, Archt'l. Critic 97
 Left caption: "Pen - Woolworth Building"

"The Woolworth Building is unique, it was explained. Its style of architecture is original in office buildings and there were no precedents or rules upon which to go. The proportions have now been ascertained and will be available for the guidance of architects in the future."
 The New York Sun, April 25th 1913
 98



"...It goes without saying that sound construction, good planning, adaptability to needs and proper economy are all essentials of a properly organized and well managed building - but, to speak purely from the standpoint of design, the greatest element of monumental architecture is good proportion..."
 Cass Gilbert, Architect
 RE: excerpt from his writings on public buildings (1929). Gilbert believed that the over-arching quality governing both interior decorative and/or exterior "polychromatically adjusted" design for public buildings and/or skyscrapers was proportion.
 99



Above: caption: "Photographer Jack Reilly perches on the 72nd story of the Bank of Manhattan with the Woolworth Building in the background, November 13, 1929"
 Left: caption: "German Zeppelin seen above the Woolworth Building, New York City, 1928" 100

Building Provides Mooring Masts for Zepps

NEW YORKERS may soon become accustomed to the sight of great hydrogen-filled balloons soaring in the sky of downtown Manhattan. For the Empire State Building, now under construction at 34th Street and Fifth Avenue, architectural plans call for a mooring mast of 200 feet high.

The new building, which will rise to a height of 1,471 feet, will be the tallest structure in the world. It is planned to make this building the mooring mast for hydrogen-filled balloons.

Fast Burning Tar Gas Candles

The successful use of tar gas in mooring balloons has resulted in great interest in the latter application in the chemical industry. The Chemical Warfare Service of the army, as a result of reports by a marine gas developer that will produce a gas candle immediately of high combustion, especially in the case of hydrogen, has been studying the design of the new material but has not yet made for use.

These candles were developed in order to meet the demand for a tar gas mixture that will produce an efficient gas candle, which is probably that a mixture of the two gases is used in the new mixture and it is possible that other mixtures will be developed in the future.

The gas gets into the air with the help of the great velocity.

The older candles were made of wood. It is reported that the gas was contained in a tank and the gas was released through a tube after having the heat that is the cause of the gas getting off in the form of great quantities. The heat of these candles will be carried with great velocity and will be very hot to the touch.

Old Auto Cylinders Cut Length

A remarkable experiment has been made in England with old-fashioned cylinders, the idea being to save length, the necessary size of the cylinders being placed in a line and all cylinders. These cylinders would be substituted to a 75' round cylinder but take no more than one 3' inches in diameter.

Low Ocean Airships Could Anchor To a Tower on Woolworth Building

GROUND GAIN IN CONTEST OFFERS TO

King of Utah, W. D. Ryan to Opp. Old Agreement

State - State

Defending 1

W-S'S ROUND TRIP OVER SEA FIRST STEP TOWARD REGULAR TRANSPACIFIC AIR SERVICE

CRONKER'S SON IN \$217,200 VERDICT AGAINST FAIR

Building provides mooring masts for Zepps

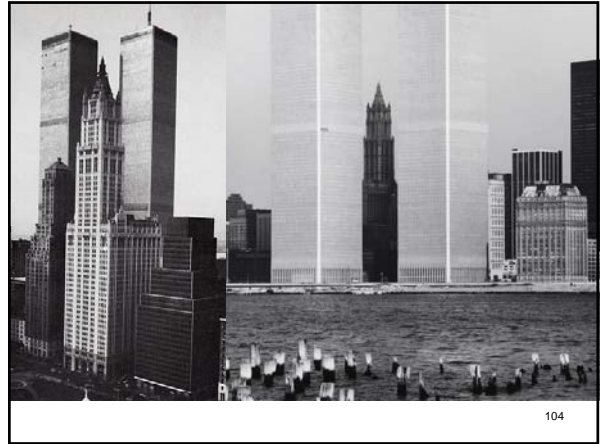
Above: an article appearing in the New York Evening World in July 1919 - with the Woolworth Building's Tower potentially serving as a mooring mast for dirigibles. Though the scheme was never realized, such an attempt was made twelve years later (1931) with the construction of a 200-foot tall mooring mast atop the Empire State Building (Left). 101





"It is a fairy-story come gigantically and triumphantly to life, and can never be forgotten"
Julian Huxley, Author
Left: caption: "View of Woolworth Building from World Trade Center (1978) - Cleveland Museum of Art"

103



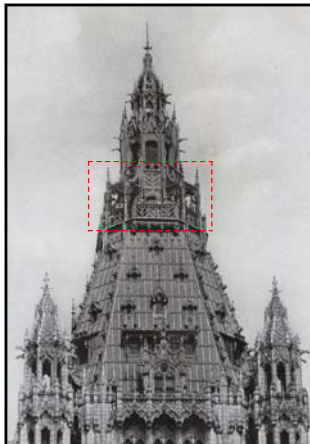
104



105

Impossible of Adequate Description

106



"...From the Observation Gallery...the view is marvelous, and the thrilling sensation which comes over the sightseer is never to be forgotten. It is indeed the most remarkable if not the most wonderful view in all the world. The scenic and color effects, with the sun shining on the multi-colored buildings around it, but far below, and on the water and land for twenty-five miles in every direction, make a landscape impossible of adequate description. The vast area spread out before the visitor's eye is inhabited by more than 8,000,000 souls..."

RE: excerpt from "The Cathedral of Commerce"

Left: caption: "A Tele-Photo View of the Observation Gallery"

107

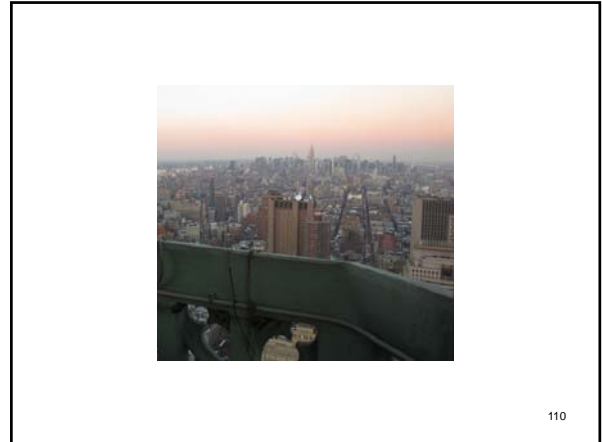
"...To the north lies the great City, with the Hudson River and the lordly Highlands beyond. To the east are Long Island and the mighty Atlantic Ocean, with its ships passing to and fro far distant on the horizon where sky and water seem to meet. To the south are the great Harbor of New York, the Narrows through which pass all ships entering and leaving the Port of New York, Governor's Island, the Statue of Liberty and Staten Island in the distance. To west again is seen the Hudson River and the great expanses of meadow-land and mountainous country embracing Eastern New Jersey. Looking downward, the multitudes of people scurrying about the busy streets in close proximity to the Woolworth Building resemble an aggregation of pygmies – a crowd seen through the large end of a telescope. The view is bewildering..."

RE: excerpt from "The Cathedral of Commerce"

108



Above: caption: "View/s From the Observation Gallery (clockwise from top left): South / North / East / West" 109



110

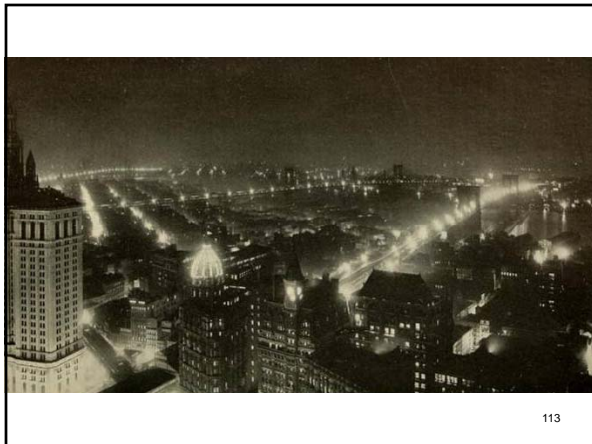


"...A visitor to the Woolworth Building is naturally first impressed with its altitude, and this impression is deepened and strengthened by the wonderful view obtained from the highest portions of this monument to architectural progress and modern enterprise. This view of a great city, lying at your feet and yet so far away that its myriads of bustling citizens seem but Lilliputian travesties of themselves, can be likened to nothing else in the world. It is perhaps as the summit of a venerable metropolitan Alpine height, portraying the spirit of the times in its most exalted mood..."
 RE: excerpt from "The Master Builders"

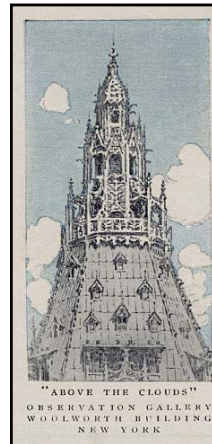
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112



113



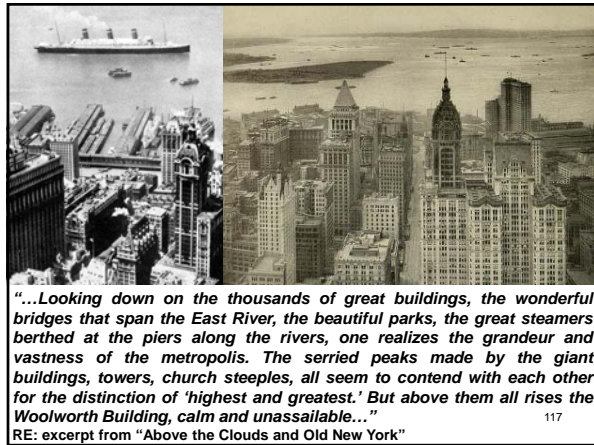
"...Every year upwards of 100,000 visitors from all parts of the world come here and the Register shows that these good people represent more than sixty different countries and thousands of cities..."
 RE: excerpt from "The Cathedral of Commerce." Visitors to the Woolworth Building paid \$0.50 for a ticket to visit the Lobby and the Observation Gallery, which closed in 1945.

114



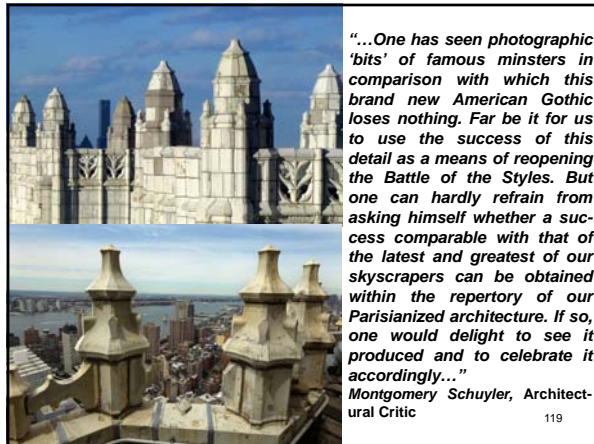
Highest and Greatest

116



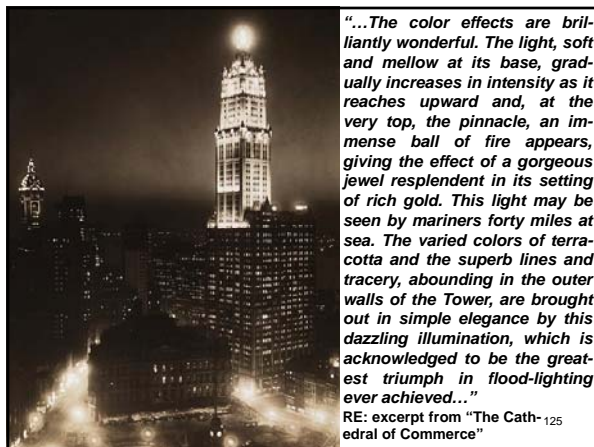
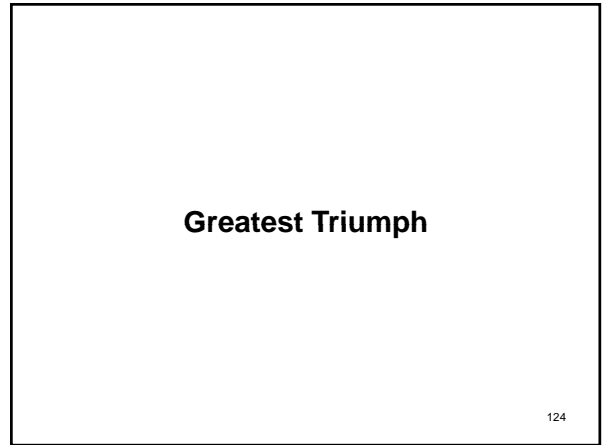
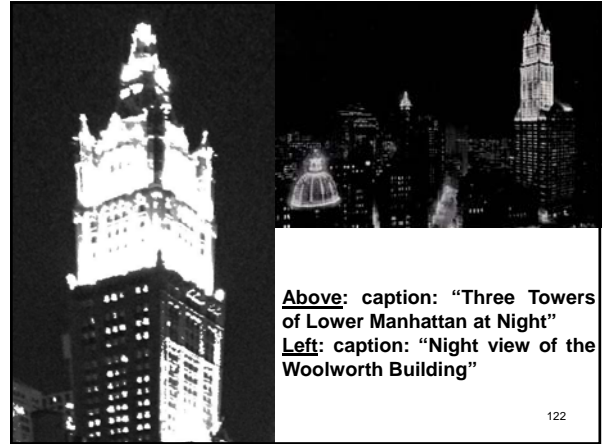
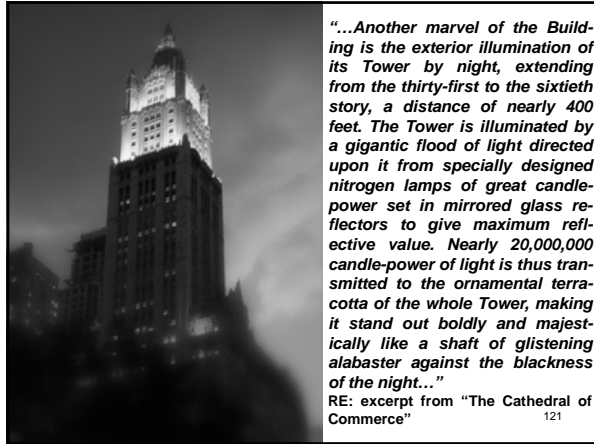
American Gothic

118



Against the Blackness of the Night

120





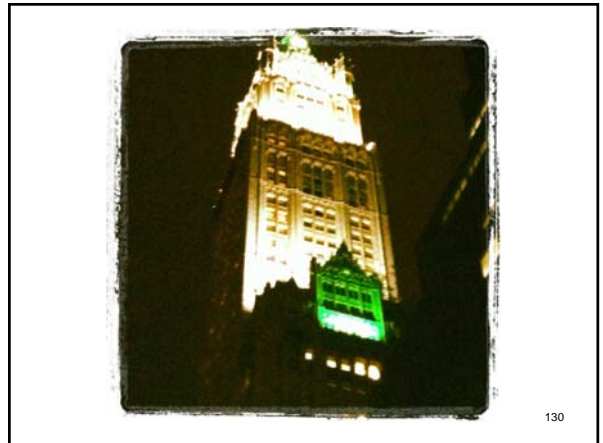
127



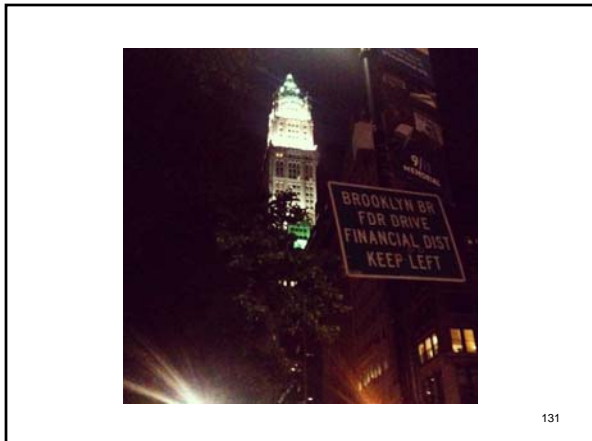
128



129



130



131

For the Convenience of Tenants

132

"...For the convenience of tenants, a completely equipped Hospital Room has been established for female stenographers, clerks, and others, where they may receive first-aid treatment and simple remedies at the hands of a competent nurse or rest quietly from the mental or physical strain attendant upon their work. Quick relief is thus afforded and sometimes serious illness is prevented. Should any case be so serious as to require the attendance of a physician, one may be had within a few minutes. This



room is maintained as part of the Building's general service for which no charge is made. Public Committee or Board Rooms are also available for tenants' use. These rooms are elaborately appointed, and may be engaged for limited periods at very reasonable rentals..."

RE: excerpt from "The Cathedral of Commerce"

Left: caption: "Emergency Room for Tenants and Visitors"

133

"...The public corridors throughout are spacious and well lighted and ventilated. They have flooring of polished marble terrazzo and wainscot of selected Italian marble carried half-way up to the ceiling. Directories on every floor below the Tower enable one to locate his destination quickly upon alighting from the elevators. The toilet facilities are unique as regards the number of rooms assigned for that purpose and the elegance of their appointments. A toilet room for ladies and one for gentlemen will be found conveniently located on practically every floor of the entire building. Their walls are lined with white carrara glass, the costliest, most sanitary, and most attractive wall treatment known for this purpose. The ceilings are of white enamel, and the floors of white flint tile. The fixtures, too, are the last word in modern design and construction. Without exception these rooms are all the word 'sanitary' implies..."

RE: excerpt from "The Cathedral of Commerce."

134

Tenants started to move into the building in the Fall of 1912; only eighteen months after work started on the foundation (workmen were still fitting out the spire as the lower floor offices were occupied). The Woolworth Building was formally opened on April 24th 1913. F.W. Woolworth Co. occupied the whole of the 24th Floor and part of the 23rd Floor. FW aspired to make his skyscraper "the greatest income-producing property" in NYC when the building was ready for occupancy on May 1st 1913. Rental agent Edward J. Hogan advertised the building as "the highest, safest, and most perfectly appointed structure in the world." Altogether, the building enclosed 983K sq. ft. of floor area of which 563K sq. ft. was rentable office space (the U-shaped light court at the rear of the base did not allow for maximization of income-producing floor area). The highest commercial rental rates (\$4.00/SF) were charged with a premium for Broadway views. Despite this, every available square-foot of the building had been leased by opening day. In 1914 – the first full year of occupancy, rents came to \$1.3 million. After paying maintenance and operating expenses, the net rate of return came to about 2.75% - not the 5% FW had anticipated, but still within the range deemed acceptable for a lower Manhattan office building of the era.

135

"Tenants who will not have an office unless it is up where the air is cool and fresh, the outlook broad and beautiful, and where there is silence in the heart of business."

Lincoln Steffens, Author

RE: tenants of the building included lawyers, accountants, publishers, manufacturers, contractors and consulting engineers. FW was especially pleased that fifteen among "the great big railroad corporations" established offices in the building. However, in the main office block (base), no tenant occupied an entire floor (save for the F.W. Woolworth Co.). The tower was promoted for the unusually high quality of its office interiors and was known to attract "high livers." By the mid-1920s, the building was home to a wide variety of businesses numbering more than a thousand tenants who, in general, occupied suites of one or two rooms. The Woolworth Building was the first commercial property ever to have a presidential opening and, to his enduring satisfaction, it was one of very few major commercial buildings in NYC to turn a profit by its opening day. The building employed three-hundred people, responsible for everything from general maintenance to elevator and power-plant operation. Each day fifteen-thousand people worked in the building, supplemented in the early years by thousands of visitors who paid to travel up in the express elevator to view Manhattan from "Above the Clouds." The Architect and his patron received many plaudits for the building's design while New Yorker's gave it many nicknames such as "The Skyline Queen," but FW was most fond of the self-effacing "Tower of Nickels and Dimes."

136

On the Score of Economy

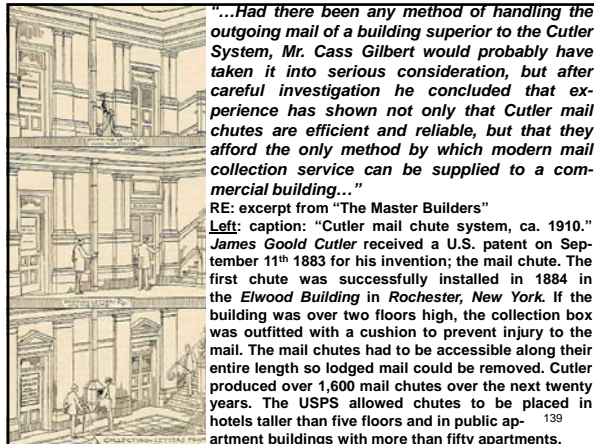
137



"...Some years ago, when the new Post-Office building at Washington, D.C., was nearing completion, the question of mail chutes versus letter boxes in each story, for the convenience of the various bureaus, was discussed and decided in favor of separate mail boxes on the score of economy. Fourteen boxes were installed in the seven stories, but it was soon discovered that the time spent in collecting the mail from these boxes delayed the mail very considerably, and it was then determined to adopt the Cutler Mailing System. The boxes were removed and two mail chutes installed, providing fourteen points at which the mail is deposited, but requiring collection from only two boxes at the post-office level, instead of from fourteen distributed throughout the building..."

RE: excerpt from "The Master Builders"

138



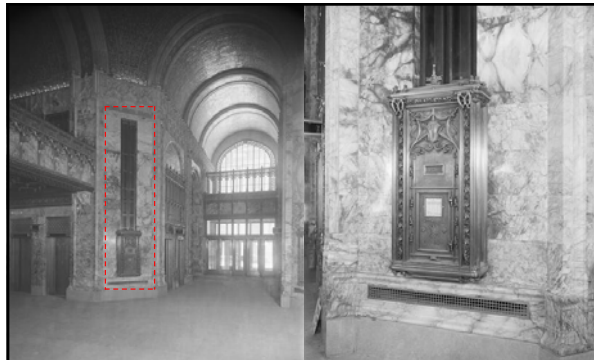
"...Had there been any method of handling the outgoing mail of a building superior to the Cutler System, Mr. Cass Gilbert would probably have taken it into serious consideration, but after careful investigation he concluded that experience has shown not only that Cutler mail chutes are efficient and reliable, but that they afford the only method by which modern mail collection service can be supplied to a commercial building..."

RE: excerpt from "The Master Builders"
 Left: caption: "Cutler mail chute system, ca. 1910." James Gould Cutler received a U.S. patent on September 11th 1883 for his invention; the mail chute. The first chute was successfully installed in 1884 in the Elwood Building in Rochester, New York. If the building was over two floors high, the collection box was outfitted with a cushion to prevent injury to the mail. The mail chutes had to be accessible along their entire length so lodged mail could be removed. Cutler produced over 1,600 mail chutes over the next twenty years. The USPS allowed chutes to be placed in hotels taller than five floors and in public apartment buildings with more than fifty apartments. 139

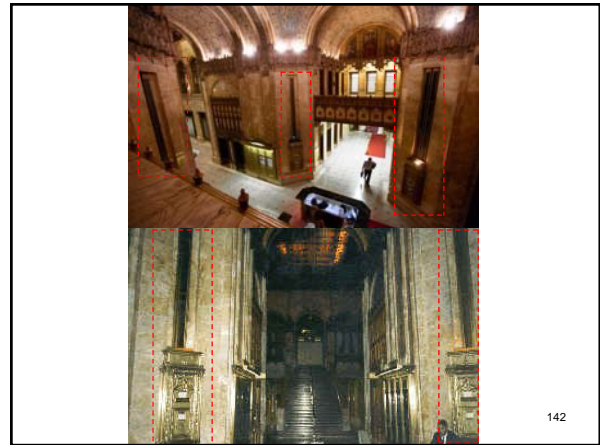


"...Notwithstanding the unusual number of floors and offices, the Cutler mail chute for the tallest building in the world was neither especially designed nor constructed, but the type known as Model F, in which the front panels are removable on occasion by a post-office official, but by no other person, was adopted. All the exposed parts of the mail chutes are covered with heavy sheet bronze, it being found impracticable to manufacture the chutes of this material, special rolled steel being necessary and the bronze covering being applied in order to conform the mail chute work to the elegant surroundings..."

RE: excerpt from "The Master Builders"
 Left: caption: "Cutler Mail Chute 140 - Model F"



"...Four immense mail boxes for receiving letters in the main corridors were designed by the architect and are harmonious with the general ornamental character of the marble carving and decorations..." 141
 RE: excerpt from "The Master Builders"

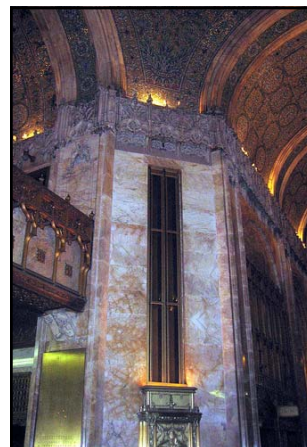


142



"...The mail chutes in the Woolworth Building are really an extension of the mail boxes to the upper floors of the building, and for this purpose two hundred and two stories of mail chutes have been installed. They consist of a heavy steel channel with its entire front of heavy plate glass, the front panel set in frames of drawn bronze reinforced by steel angles which give great strength and rigidity. These panels are removable by the use of a key exclusively in the hands of the local postmaster, so that the interior of the mail chute is accessible upon occasion to the post-office representative, and to no other person..."

RE: excerpt from "The Master Builders" 143



"...More than 70,000 pieces of mail are delivered to tenants of the Woolworth Building every business day, and from eight to ten letter-carriers are required to handle it. The tenants' outgoing mail matter is fully as voluminous and requires an additional force of handlers to convey it to the General Post Office. Four huge letter-boxes are placed in the main corridor, from which twenty-seven collections are made every twenty-four hours on week days. During business hours, the collections take place on an average of every thirty minutes, and, for the convenience of tenants, four mail chutes, connected with the mail boxes mentioned, serve every floor of the Building. Thus, a tenant on any floor may place his mail in one of these chutes and have it taken to the Post Office within half an hour afterward

RE: excerpt from "The Cathedral of Commerce" 144



"...The post-office requirements are, of course, fully complied with in the mail chutes of the Woolworth Building, and the mailing openings are controlled by a closing device which, when operated by the post-office official, brings a metal stop with the word 'closed' up in front of the mailing aperture, holding it there securely and preventing the introduction of mail matter into the chute until released by the use of the key. Special deflecting devices are used in the mail boxes, and a special door is placed in the top of each box so that in the event of any accidental stoppage, access may be had by the post-office official at the point at which the chutes discharge into the boxes. This installation is the most important ever made by the Cutler Mail Chute Company..."

RE: excerpt from "The Master Builders" 145



For two weeks in 1986, more than 40K letters accumulated in the mail chute of the McGraw-Hill Building in NYC. In 1999, a spokesperson for the New York district of the USPS claimed that they responded to two or three calls to clear stuck mail chutes every week. In recent years, buildings such as Chicago's John Hancock Center, the Chrysler Building and the RCA Building in NYC have shut down their chutes. The reason is the increase of modern mail rooms in the building's lobby with associated mail boxes available for the building tenants. There remain, however, about 360 buildings in Chicago with mail chutes and more than 900 active chutes in NYC. However, since 1997 the National Fire Protection Association (NFPA) has banned mail chutes in all new building construction. The original Cutler Mail Chutes in the Woolworth Building are no longer in use, serving instead as risers for fiber-optical cabling.

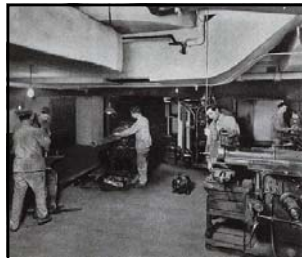
Above: inactive chutes in the Empire State Building¹⁴⁶
 Left: still-in-use Cutler Mail Chute, Boise, Idaho

SERVICE

147

"...No description of the Woolworth Building is complete without a word concerning the vitally important feature called SERVICE, a feature, perhaps, more important than all others to tenants. Every possible need of the tenant is anticipated and cared for promptly, courteously, efficiently. The smooth-running organization, planned and developed as it has been along departmental lines, as in a great railway system, has, for example, its Fire, Police, Cleaning, Repair and Maintenance Departments, on duty night and day, always, each working with rigid alertness and fidelity. The Building contains nearly 30 acres of floor space, yet this vast area is cleaned – yes, and thoroughly – every single day, but not during business hours when such work would disturb tenants. The 5,000 or more windows throughout the Building are cleaned once every week and more often when storms make it necessary. The work of the Night Watchman, who make hourly patrols of the entire Building, and of the Police and Detective Forces, is especially important to tenants, because it insures the absolute security of their property during closed hours and prevents interruption and annoyance during business hours, of a kind commonly experienced in some office buildings..."

RE: excerpt from "The Cathedral of Commerce" 148



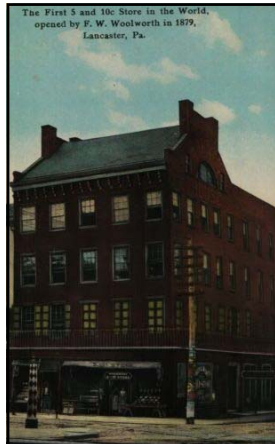
"...Substantially all of the repair work – and this is a vast item – is executed by the Building's mechanical forces, which include, among others, the Electrical, Plumbing, Heating and Elevator Maintenance Departments, all operating coordinately and under well-trained heads. Even the tools required to perform special classes of work are made by the house mechanics, and the Building may be said to be self-contained. Absolute cooperation exists among all departments, and, to a man, the 300 odd employees know how to serve. They go about their work determined to satisfy and please every tenant from the largest to the smallest uniformly, knowing as they do, that upon that altogether the success of the great institution depends..."

RE: excerpt from "The Cathedral of Commerce"
 Above: caption: "One of the Workshops"

149

A Monument to Small Things

150



The First 5 and 10c Store in the World, opened by F. W. Woolworth in 1879, Lancaster, Pa.

"...The Woolworth Building has been called 'A Cathedral of Commerce' – a monument to small things, but it is even more – it is the colossal and enduring gift to civilization of a true-born, patriotic American, Frank W. Woolworth, and it stands unique in the history of great buildings throughout the world in that it is without a mortgage or dollar of indebtedness. Mr. Woolworth paid for this gigantic structure from start to finish from his own resources, accumulated through his business sagacity in establishing an entirely new line of merchandising through retail stores handling only five and ten cent goods. This wonderful enterprise, starting from one small store in 1879, has grown to a \$65,000,000 corporation, operating over 1,000 stores throughout the United States, Canada, and Great Britain, with combined sales exceeding \$87,000,000 in 1916 – the largest retail business in the world..."
 RE: excerpt from "The Cathedral of Commerce" 151



152

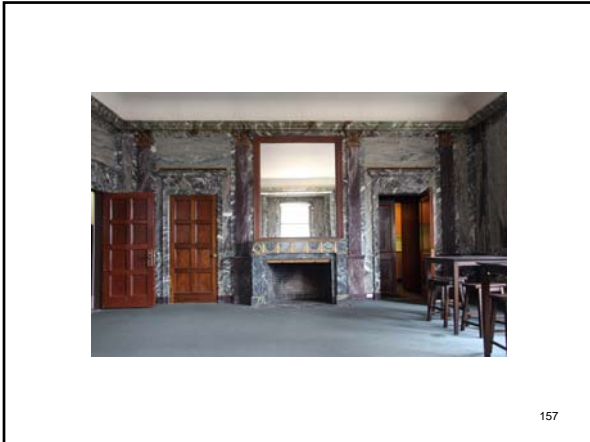
"...Thus the name Frank W. Woolworth has been indelibly inscribed throughout the length and breadth of our land and abroad, and the Woolworth Building, symbolizing, as it truly does, the crowning achievement of a career of usefulness toward mankind, will long herald the march of progress down through the corridors of time."
 RE: excerpt from "The Cathedral of Commerce" 153

"Men are only as great as the monuments they leave behind"
 Napoleon Bonaparte
 Above: a study for F.W. Woolworth's private office in the Woolworth Building (based on a room in Napoleon's castle in Compeigne, France)
 Left: the ornate coffered ceiling in FW's office 154

FW's executive office (left) on the 24th floor was known as the "Empire Room." FW considered Napoleon Bonaparte to be an "original man" and feverishly collected Napoleonic memorabilia for his office decor. Included among the collection a life-sized portrait of the French Emperor in his coronation robes, a bust of Napoleon as Julius Caesar, and a clock given to Napoleon by Czar Alexander I of Russia. Like his idol, FW was imperious in achieving his life-goals.

155

FW's thirty-foot square office chamber had views to the south and east. Its walls were lined with richly veined dark marble while an ornate coffered adorned the ceiling.
 Top Left: caption: "Mr. Woolworth's Private Office on the 24th Floor Showing Flemish Renaissance Tapestry (Woven About 1650) and Italian Renaissance mantelpiece Carved in Stone"
 Top Right: caption: "West Side of Mr. Woolworth's Private Office Overlooking the Hudson River and Eastern New Jersey"
 Left: caption: "The Empire Room – Executive office of the President of F.W. Woolworth Co." 156



157

Part 2

FW

158

Lesson Learned

159



Late in his life, *Frank W. Woolworth* recalled a particularly formative moment that occurred during his teenage years. He and brother *Charles Sumner Woolworth* (who he called "Sum") saved up all their nickels and dimes over a year's time in order to buy their mother a birthday present. The brothers went to the center of *Watertown, N.Y.* (above) in search of a gift. They settled on a scarf costing fifty-cents. When they went to pay for it with all their hard-earned loose change, the store assistants gathered around to snicker at them. The boys were teased that in a whole year's time they hadn't scraped together enough money to buy the matching gloves that went with the scarf. FW still felt the humiliation years later, resenting the way poor customers were treated as compared to the wealthier townfolk. Disgusted, he and Charles walked out and bought a gift for their mother from another store. On the way home, he told Charles that one day fifty-cents would be enough to buy five or even ten items and every customer would be treated with respect. It was an important experience in both boy's lives, one which later inspired the Woolworth stores' core values of friendly, efficient service to every customer, regardless of whether they were spending a little or a lot.

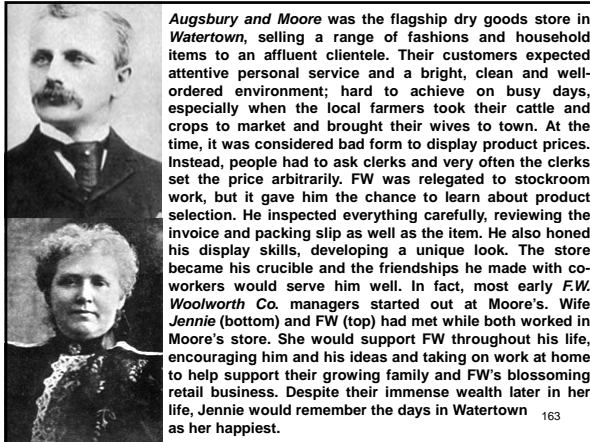
160

The Great Five Cent Store

161

Frank Winfield Woolworth was born in 1854, in the small town of *Rodman, New York*. He grew up on his family's farm near *Great Bend, in Jefferson County, NY*. Though the Woolworth's had been farmers since the *17th Century*, FW had ambitions greater than farm life. After working for about two years as a clerk in a village store for no salary (to gain experience in business), in March 1873 FW began his retail career in the employ of *William Harvey Moore* – a leading dry goods merchant. He earned nothing for the first three months and then began to receive \$3.00/week. About two and a half years later he had advanced to \$6.00 a week. He worked for Moore sporadically for five years. Between 1873 and 1879, FW's income continued to consist largely of experience and little money. He married *Jennie Creighton* on June 11th 1876. Shortly after, his salary dropped to \$8.00/week causing FW to suffer a nervous collapse. A brief attempt at farming followed, but by 1877 he had returned to retailing.

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Augsbury and Moore was the flagship dry goods store in *Watertown*, selling a range of fashions and household items to an affluent clientele. Their customers expected attentive personal service and a bright, clean and well-ordered environment; hard to achieve on busy days, especially when the local farmers took their cattle and crops to market and brought their wives to town. At the time, it was considered bad form to display product prices. Instead, people had to ask clerks and very often the clerks set the price arbitrarily. FW was relegated to stockroom work, but it gave him the chance to learn about product selection. He inspected everything carefully, reviewing the invoice and packing slip as well as the item. He also honed his display skills, developing a unique look. The store became his crucible and the friendships he made with co-workers would serve him well. In fact, most early *F.W. Woolworth Co.* managers started out at Moore's. Wife *Jennie* (bottom) and FW (top) had met while both worked in Moore's store. She would support FW throughout his life, encouraging him and his ideas and taking on work at home to help support their growing family and FW's blossoming retail business. Despite their immense wealth later in her life, *Jennie* would remember the days in *Watertown* as her happiest.

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His first employer, *Augsbury & Moore of Watertown, N.Y.* (renamed *Moore and Smith*) had, in 1878, successful sales of five-cent items which aroused FW's interest. In the fall of 1878, *Moore & Smith* offered a counter laden with goods pre-priced at five-cents. It was not a new idea, but was still something of an innovation. Instead of asking the store clerk to weigh-out an item and then price it accordingly (as was typical at the time), the customer helped themselves. It was quick, convenient, had a high turnover and required fewer store clerks to operate the store. FW realized that what worked for one counter could work for a whole store. In 1878 he borrowed \$300.00 from *W.H. Moore* and opened "The Great Five Cent Store" in *Utica, New York*.

Left: caption: "William H. Moore, who gave Frank Woolworth his first job in his department store in *Watertown, N.Y.*"
Right: caption: "The *W.H. Moore* store at *American Corner* in *Watertown, New York*"



Although *W.H. Moore* was too modest to say so out loud, it was he who had given the order to set up the fixed price five-cent table which inspired FW's first "Great Five Cent Store." He also bankrolled it, underwriting the original venture by advancing FW \$300 to help his former clerk get started. FW never forgot his kindness. When Moore's store hit hard times, he bailed it out; financing a restructure. Knowing Moore was a proud man, he never suggested a buyout. Instead, he gently helped his mentor to build a five and ten-cent business of his own (right). He also made a point of naming *W.H. Moore & Sons* as part of the giant merger when his buying syndicate joined forces, in recognition of Moore's defining role in his life. The move brought a windfall to the Moore family; they received nearly half a million dollars for their *Watertown* and *Schenectady, N.Y.* store/s and for *W.H. Moore's* shares in *F.W. Woolworth & Co.*, which he had held since 1905. The 71yo Moore senior was elected an honorary vice president and director of the new Woolworth corporation. FW valued this friendship above any other and was deeply saddened when Moore died suddenly in 1915 after a visit to the dentist. FW would endure horrific toothache for the rest of life rather than risk the same fate as his mentor and friend.

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For a few weeks after opening the *Utica, NY* store (left) it was a hit, but gradually business declined. Despite the setback, FW remained convinced about the "Five & Dime" concept. He concluded that it had been a mistake to locate in a back street. Next time, he would find a busy street in a town where the shoppers were more thrifty and would welcome his bargains. He served notice to the landlord, sold his stock and banked enough cash to settle the rent and repay his \$300 loan from *W.H. Moore*. As he closed the doors in *Utica* after only two months' time, FW established several key principles for the future:

- location is key;
- behave honorably to your suppliers and, in return, they will treat you likewise, and;
- if a store is unprofitable, close it and relocate asap

On July 21st 1888, a new *F.W. Woolworth* store opened in *Utica*. This time around, FW chose a prime location; *153 Genessee Street*, and hired his friend and former Moore's co-worker *Carson Peck* to manage it. The results were spectacular and in 1890 Peck was promoted to *General Manager* of the whole company. The thriving store was sold to FW's brother *Charles* and soon it became one of the mainstays of his operation (right).

166

The Thriftiness of the Pennsylvania Dutch

167

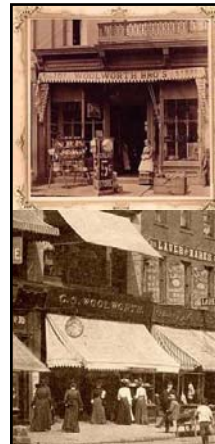


Despite his best efforts, the store in *Utica* had failed. Undeterred and lessons learned, FW opened a five and ten-cent store in the livelier town of *Lancaster, Pennsylvania* on June 6th 1879. The shelves were stocked with attractive but inexpensive everyday objects; pencils, red napkins, coal shovels, cake tins, boot blacking, police whistles etc. - products priced at either five or ten-cents. The store was a great success. FW attributed this, in large part, to "the thriftiness of the Pennsylvania Dutch."

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"Lancaster Pa, June 22nd 1879. DEAR FATHER, I opened my store here for trade yesterday and did not advertise any. No-one knew there was a five-cent store in this city until Friday night and we managed to sell yesterday in one day \$127.65, which is the most I ever sold in one day. We sold \$80 in the evening alone. I had seven clerks and they had to work you bet. We could have sold \$200 if the store had been larger. Jennie helped me last night...I am thinking of starting a branch store in Harrisburg, Pa. and putting Sum in it if Moore and Smith will spare him. F.W. Woolworth"
 Left: caption: "Woolworth's first 5 and 10-cent store in Lancaster" 169



FW opened a store in Harrisburg, PA but it failed. The Woolworth brothers traveled far and wide in search of other towns to locate stores. In March 1880, they closed the Harrisburg store and, after another experiment in nearby York, PA (managed by Charles for \$8.00/week), they took a shop on Lackawanna Avenue, in fashionable Scranton, PA (left T&B), opening on November 6th 1880. The business became known as "Woolworth Bros. 5 and 10 Cent Store." Results were good, allowing Charles to buy out FW in two stages at the end 1880 and 1881. Charles would make Scranton his home during a successful re-tailing carrier spanning 68 years. 170

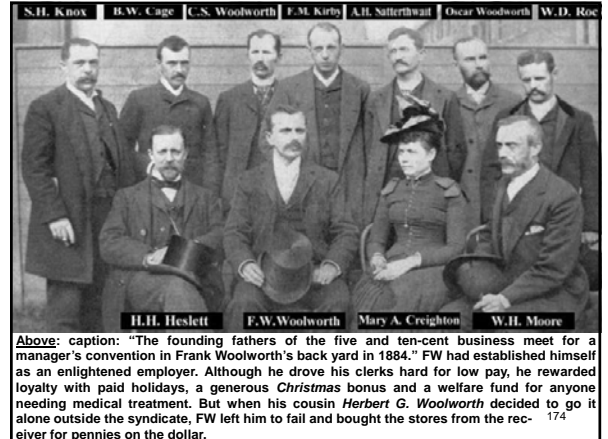


As more stores opened, FW developed a formula for identifying the best place to locate his store;
 • a small town with a prosperous economy;
 • on a busy main street, and;
 • in the commercial part of the town
 By 1886, FW had seven stores in Pennsylvania and as the business grew, he was able to convince manufacturers to sell him goods at prices low enough for resale at five or ten cents (they made up their lower profit with greater volume). Thus, FW was able to gradually increase the range of goods that could be sold for a nickel or a dime. For the first time, items such as candy (\$0.05 per quarter pound), tinsel ornament, white china cups and plates, dolls and many other items which had never been sold at such a low price could be offered for sale. 171

The Syndicate

172

In 1881, FW returned to Watertown and was greeted as a hero. To date, he could boast of earning \$4K in profits. FW was convinced that a chain of stores, spread far and wide, would give him lots of buying power without the stores competing directly. He could also avoid debt if each store was run by a partner who put up stake money in exchange for a share of the profits. Hence the "friendly rivals" were born. Before long he had signed up his cousins Seymour Knox and Edwin McBrier and had explored the idea with Fred Kirby, Carson Peck, Clinton Case and Alice Coons - all co-workers from his days at Moore's. During the 1890s, this "syndicate" established a friendly rivalry in which the members shared ideas and pooled buying power as they sought to expand rapidly. Knox and Earle Perry Charlton (a traveling salesman brought into the syndicate by Knox) opened stores in Canada on both sides of the Rocky Mountains while Kirby headed south, taking on Ohio, Virginia and Kentucky en-route to Louisiana. Occasionally, they even traded stores to accelerate their progress. Five and ten-cent stores became a phenomenon, with the Woolworth syndicate far outstripping their main competitors; McCrory's, Kresge and N.M. Rothschild. A big part of their success was FW's buying skills, which was widely acknowledged. Another part of the secret to their success was in the marketing, with the stores among the first to "loss-lead" to gain new business. Each of the pioneering syndicate members made large sums of money during this time, investing the bulk of the profit into additional openings and, as confidence grew, into an improved store environment. To set them apart from competitors, by the mid-1890s branches included elegant mahogany counters and electric lighting. 173



Above: caption: "The founding fathers of the five and ten-cent business meet for a manager's convention in Frank Woolworth's back yard in 1884." FW had established himself as an enlightened employer. Although he drove his clerks hard for low pay, he rewarded loyalty with paid holidays, a generous Christmas bonus and a welfare fund for anyone needing medical treatment. But when his cousin Herbert G. Woolworth decided to go it alone outside the syndicate, FW left him to fail and bought the stores from the receiver for pennies on the dollar. 174



FW's early colleagues (when he worked for *Augsbury & Moore*) described him as being a poor salesman. However, he was particularly good at purchasing. Since, at first, he did all the buying himself and most of his suppliers were in NYC, he moved there in 1886, setting up an office in *Manhattan* and a residence in *Brooklyn*. In 1888 he moved into the *Sun Building* on *Park Row*, remaining there for twenty years. FW made his first buying trip to *Europe*, in search of lower cost goods to sell in his stores, in 1890. In 1895, the first big-city Woolworth's opened in *Washington D.C.*, quickly followed by stores in *Brooklyn, Boston, Philadelphia, New York* and *Pittsburgh*. FW's idea had caught on and by 1900, the chain had grown to fifty-nine stores.

Left: NYC's *Fifth Avenue Woolworth's*
Right: Chicago's *State Street Woolworth's*

175

"The monumentality and grandeur of Paris' boulevards made a forceful impression on Woolworth"

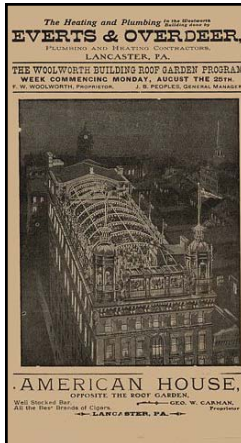
Gail Fenske, Author

RE: beginning in the 1890s, FW made numerous trips to *Europe*, looking for goods to sell in his stores. While in *Europe*, FW became enamored of the architecture, in particular *Aristide Boucicaut's* luxury superstore; *Le Bon Marche* (designed by *Louis Auguste Boileau*) and the *Palais Garnier* home of the *Paris Opera*, designed by architect *Charles Garnier* (FW was an opera aficionado). He was also tremendously impressed by London's *Houses of Parliament*. He wondered at the cost of the building, whose Gothic exterior would influence the design of the building to bear his name. From *London*, he wrote: *"They have some fine stores in London, but we have not found them. I think a good penny and sixpence store run by a live Yankee would create a storm here, but maybe not."*

176

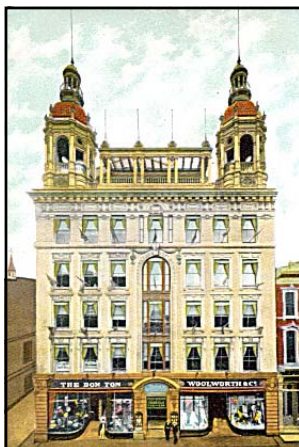
By 1900, the "Five & Dime" concept was a great success. FW's syndicate of friendly rivals - who all stocked his merchandise, required that he spent most of his time on buying trips. This took him to *Europe* regularly, chasing new novelties and luxuries (ultimately, he made over fifty trans-atlantic trips). The visits gave him a chance to take in the local culture; visiting museums, art galleries and landmarks and keeping an eye on shopping trends. However, his commercial success brought very little of the social acceptance he craved. It seemed high society regarded him as a mere shopkeeper rather than the "Merchant Prince" he saw himself as. FW resolved to set the record straight and to leave his mark on society and posterity. He observed that real estate developers highly prized good building schemes which tended to generate excellent financial returns. FW began to plan a real estate development of his own.

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FW had considered enlarging his store in *North Queen Street, in Lancaster*, for some time. The branch held a special place as being his first success. Rather than expanding into adjacent premises, he systematically bought up property along the road, all the while keeping his plans secret to avoid inflating the price. When he had acquired the whole block, he revealed spectacular plans for a "skyscraper" which would consist of well-appointed retail space with five floors of offices above, topped by a roof garden and an open-air theatre with panoramic views. The proposal was well received and work started without delay. The opening was a resounding success and the "Woolworth Building" quickly established itself at the heart of the local community. FW's first real estate development left him with a taste for more, albeit on an even grander scale.

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The photograph above shows the sales floor in the *Lancaster, PA "Skyscraper"* (ca. 1914). The layout includes many of the features first pioneered by FW's brother - *Charles Sumner Woolworth*, in his flagship store in *Scranton, PA* including well-appointed mahogany counters, wide gangways and bright electric lighting. In many ways, the *Lancaster building* (left) was a dress rehearsal for the *Woolworth Building* commissioned a decade later. It paid its way, thanks to a marketing campaign that was initiated before the first brick was laid. It was opulent; with gargoyles and turrets on the outside and the finest interior fittings throughout.

179

Incorporation

180

"This will be the last letter I shall write to you as individual owner and proprietor of all the five-and-ten cent stores running January 1, 1905. It is a sad occasion and I will tell you later why I am transferring my business to a Corporation. Hereafter I will write to you as a representative of a Corporation. I am sorrowful, but modern methods must be pursued. Twenty-six years I have endeavored to conduct five-and-ten-cent stores on an honorable and systematic and paying basis. But time is fast flying away and I cannot expect always to be in control of this vast property. The ties that have bound us together so long are not broken. We are now more united than ever. Now every manager of every store, every clerk and office boy, every sales-lady is safe because no matter what happens to me, or to any officer of the company, the business goes on just the same. Before you were all taking chances in betting on my health and ability. Every time I have been sick or unable to work I have thought of the terrible responsibilities resting on my shoulders and of so many people depending on my health. The corporation is more expensive than the old way of doing business, but that is the penalty for security. We could have capitalized for much more and sold stock to the public, but we're not going to do that. Subscriptions have already been received for 6,431 preferred shares. I am not anxious to dispose of any stock, for as fast as I sell my income is reduced, and I think I'll put a price of \$110 per share after the first dividend is declared. However, if any manager wants a little more, I may be able to accommodate him at par, even after April 1. Now about the security. Is this stock worth \$100 a share? Is this business worth \$5,000,000? All I can say is I was offered that much for it before it was ever turned into a corporation. Preferred stockholders really have the first mortgage on the entire property, though power of control is vested in the common stock. The common stock is held by myself and the managers of the New York and Chicago offices only, and none of this stock is for sale at present."

F.W. Woolworth
 RE: incorporation of the F.W. Woolworth Co. in 1905

181



The shares were divided between 50K shares of preferred and 50K shares of common stock, each with par (face) value of \$100. The preferred stock guaranteed a 7% dividend, which was payable quarterly on the first day of April, July, October and January. The common stock did not guarantee a fixed return, but would return an income once the preferred obligations were met. The preferred stock was offered at par value to members of the *Woolworth* family and the employees. A number of executives were given stock on the condition that they stayed with the company for a minimum of five years (until January 1st 1910). There was no public subscription. Thus the Woolworth empire remained strictly a family affair. Within seven years, the stock had increased in value by more than six-fold, setting the pattern for continued steady growth through to the 1920s.

182



In 1900, FW had decreed that all of his fifty-nine stores be given identical facades, thus was created the familiar "crimson red" Woolworth's storefront. In 1904, FW opened stores in the *Midwest* and in 1909, seven branch stores opened in the *United Kingdom*. By 1910, FW had nearly three-hundred five and ten-cent Stores. In 1912, he merged with four "friendly competitors" thus the "F.W. Woolworth Co." was now in control of 611 stores worth \$65 million. By 1918, the "one-thousandth" Woolworth store opened (in NYC).

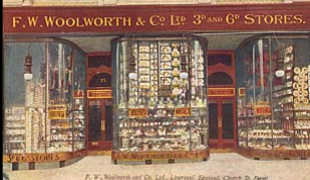
183

Woolies

184

FW had a lifelong love affair with *Europe*. As a boy, he was a regular visitor to the abandoned home of Napoleon Bonaparte's brother; *Joseph*, in upstate *New York*. As he grew older and more affluent, he followed the fashion by paying researchers to trace his ancestry. This revealed strong links to "the old country" – *England*, revealing the Woolworth family's origins in *Woolley, Cambridgeshire*. He even discovered that his ancestors had emigrated to *America* aboard the *Mayflower*. FW now determined that what England really needed was some *Yankee* ingenuity in the form of a good "3 & 6-pence" store.

185



F. W. WOOLWORTH & CO^{LD} LTD
Big to announce the opening of their
3^d and 6^d STORES
AT 25-25a, CHURCH-STREET, AND 8, WILLIAMSON STREET
FRIDAY, NOVEMBER 5th, FOR INSPECTION ONLY
MUSIC 2 p.m. to 9 p.m. DECORATIONS.
No Goods sold this day, but the public are invited to freely inspect the beautiful buildings and big values
TEA SERVED FREE IN TEA ROOM, First Floor, Church-street
Open for Business, SATURDAY, 8.30 a.m.
NOTHING IN THE STORES OVER 6d

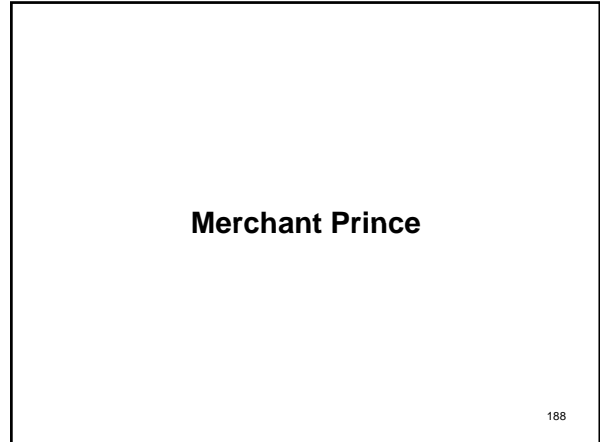
"Many thousands of people yesterday afternoon and evening availed themselves of the opportunity afforded by the proprietors, Messrs. F.W. Woolworth & Co. Ltd., of inspecting their new stores at Church Street and Williamson Street. The handsome premises, formerly occupied by Henry Miles & Co., were thronged the whole time they were open, many no doubt attracted by the novel character of the business transacted. 6D is the highest price charged for any single article in the establishment, but the variety of articles obtainable is infinite..."

Liverpool Daily Post & Mercury, November 6th 1909
 RE: the first British Woolworth's opened in *Church Street, Liverpool* on November 5th 1909 (above L&R). FW had chosen the location after a nationwide tour, picking the bustling seaport on the Northwest coast of *England* because of its thriving industry, civic pride and superior transport infrastructure. He had been particularly impressed by the grandeur of the city's public buildings and its overhead electric railway. He delegated responsibility for planning the opening to his second cousin, *Fred Moore Woolworth*, who he had appointed managing director of the first Woolworth & Company's overseas subsidiary.



Dubbed "Woolie's" by the locals, by the summer of 1910 there was a line of stores across northern *England*, all of which were doing well. The focus then turned to *London*. FW asked his UK team to follow the NYC pattern whereby there were five and ten-cent stores on major shopping streets across the city. His goal was a flagship store on fashionable *Oxford Street*. The first *London* store opened in *Brixton* on December 10th 1910. Several others followed and by the outbreak of WWI (August 1914) fully one-quarter of the UK stores were in the *London* metropolitan area. As such, the headquarters was relocated from *Liverpool* to *Victory House*, just off *The Strand* in central *London*.

187



Merchant Prince

188

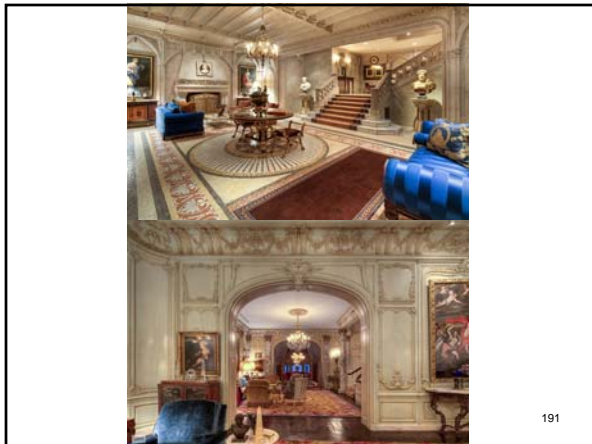
By the beginning of the *20th Century*, "Woolworth's" was a household word and FW was established as a true "Merchant Prince." A recognized member of NYC's wealthy elite, he had left his middle-class *Brooklyn* neighborhood for a suite in Fifth Avenue's *Hotel Savoy*. In 1901, he built a mansion at 990 *Fifth Avenue* (he would later build an entire compound of townhouses for his family along adjoining *East 80th Street*). He also purchased a *Long Island* "Gold Coast" estate and renamed it "Winfield Hall." However, the greatest change to FW's image of himself - and the image he presented to the world, would be embodied in the skyscraper he would build to house the *F.W. Woolworth Corporation*. FW would dismiss his architect Cass Gilbert's maxim that a skyscraper was merely: "A machine that made the land pay." FW was indifferent about costs and return on investment; he understood implicitly the power of "the tallest building in the world" for promotional purposes.

189

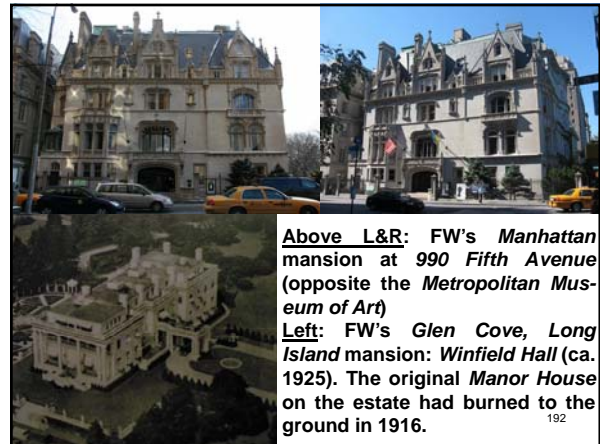


The Neo-French Renaissance townhouse at 4 E. 80th Street (left) was commissioned in 1911 by FW for his daughter *Helena*. He engaged high-society architect *Charles Pierpont Henry Gilbert* (renowned for designing mansions in the *French Gothic* style) to design his own residence as well as residences for his three daughters. FW's other two daughters; *Edna* and *Jessie*, were gifted mansions on either side of *Helena's* (above). There was an advantage to being the oldest; *Helena's* mansion was 35-feet wide, while her sisters' were each 25-feet wide.

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191



Above L&R: FW's *Manhattan* mansion at 990 *Fifth Avenue* (opposite the *Metropolitan Museum of Art*)
Left: FW's *Glen Cove, Long Island* mansion: *Winfield Hall* (ca. 1925). The original *Manor House* on the estate had burned to the ground in 1916.

192

A House in the Country

193

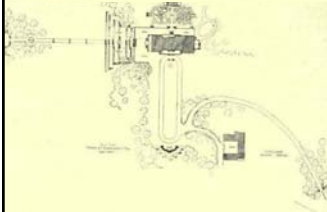
MARCH, 1920

The
**RESIDENCE OF THE LATE
 F.W. WOOLWORTH, ESQ**

GLEN COVE, L. I.

C.H.P. GILBERT - ARCHITECT

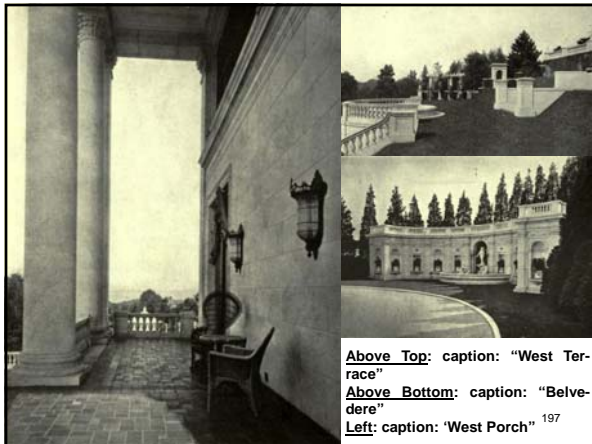
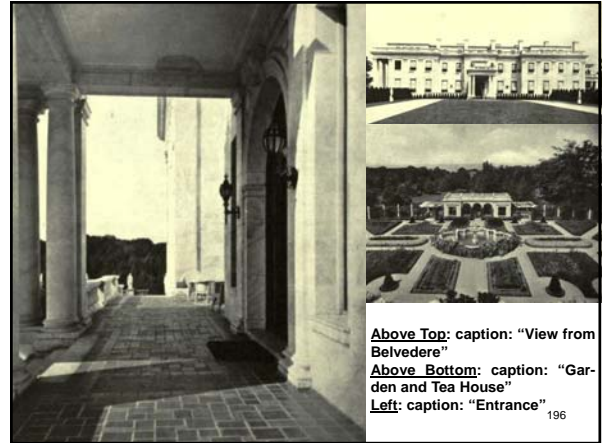
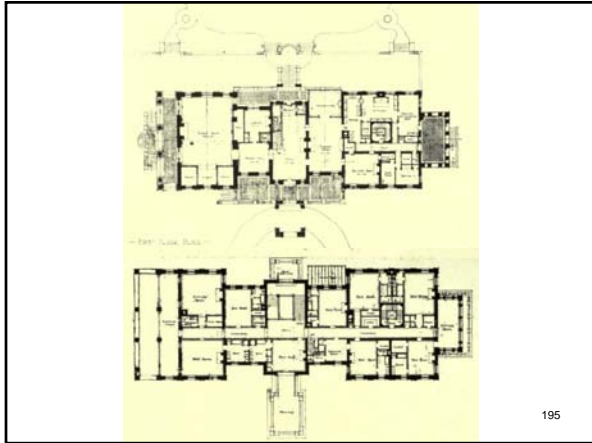
By HERBERT CROLY

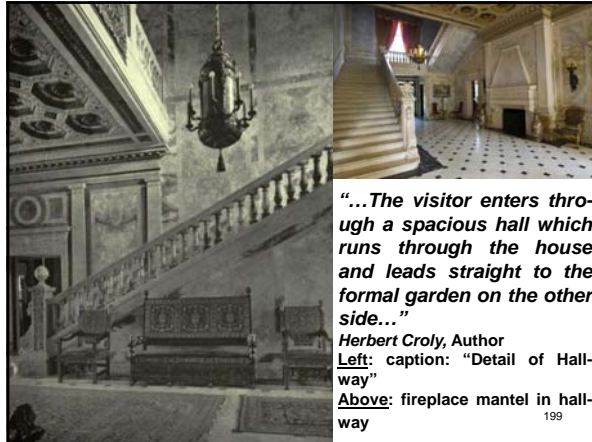


"...The estate consists of some well-wooded land overlooking the Sound. It is approached by a long winding driveway, lined by trees, which does not afford a view of the house until the visitor reaches a long oval court, lined by evergreens to which the scale of the house is nicely adjusted. The relation between the building and the formal approach to it is one of the most interesting aspects of the design..."

Herbert Croly, Author

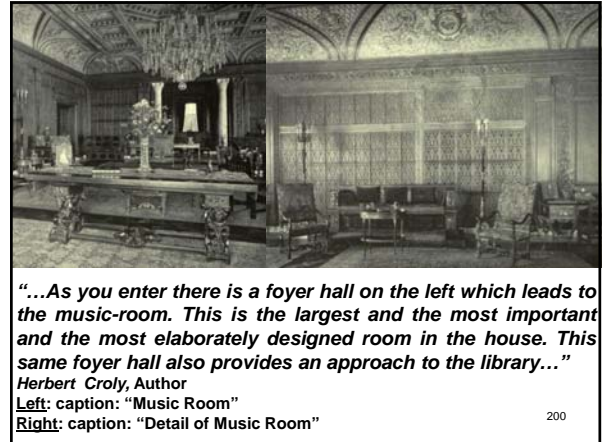
194





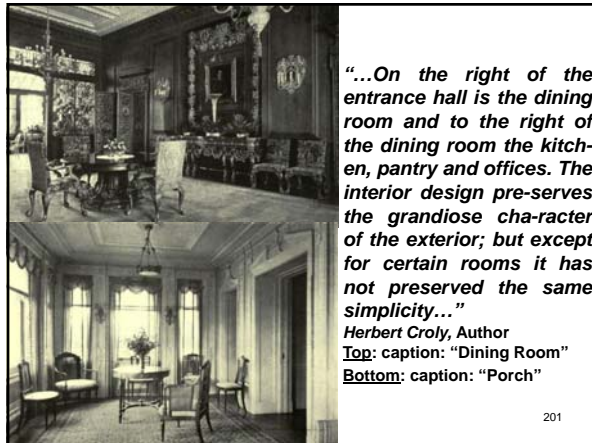
"...The visitor enters through a spacious hall which runs through the house and leads straight to the formal garden on the other side..."

Herbert Croly, Author
 Left: caption: "Detail of Hallway"
 Above: fireplace mantel in hallway
 199



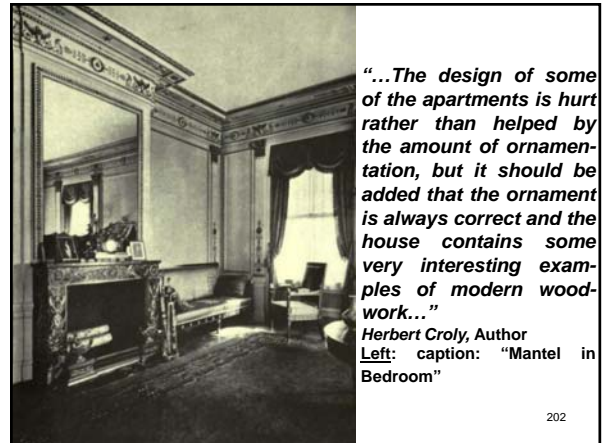
"...As you enter there is a foyer hall on the left which leads to the music-room. This is the largest and the most important and the most elaborately designed room in the house. This same foyer hall also provides an approach to the library..."

Herbert Croly, Author
 Left: caption: "Music Room"
 Right: caption: "Detail of Music Room"
 200



"...On the right of the entrance hall is the dining room and to the right of the dining room the kitchen, pantry and offices. The interior design pre-serves the grandiose character of the exterior; but except for certain rooms it has not preserved the same simplicity..."

Herbert Croly, Author
 Top: caption: "Dining Room"
 Bottom: caption: "Porch"
 201



"...The design of some of the apartments is hurt rather than helped by the amount of ornamentation, but it should be added that the ornament is always correct and the house contains some very interesting examples of modern wood-work..."

Herbert Croly, Author
 Left: caption: "Mantel in Bedroom"
 202



203

"...The interest of the Woolworth house is increased rather than diminished because of the fact that it belongs to a type of domestic architecture which is destined to disappear. In the future it is improbable that even very rich men will want or can afford a big grandiose formal residence of this kind. The high rate of income taxation will diminish the number of those who can build them, and the enormously increased cost of service will cut down the number who can operate and maintain them. Moreover, it is probably that families who occupy buildings with more than a limited provision for the accommodation of servants will eventually have to put up with special burdens. There is a tendency to tax luxuries which may in the end include dwellings with a certain number of servants' rooms in its scope. The country residence of the American millionaire of the future will, we may confidently predict, again become a smaller and more informal and a less pretentious building.

Herbert Croly, Author

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With completion of the *Woolworth Building* in April 1913, FW had made his grand declaration of success. But life took many unexpected, frequently tragic and often bizarre twists for the Woolworth family over the following decades. After the 1916 fire that destroyed the wooden Manor House, the new marble *Winfield Hall* would be more in keeping with the *Gold Coast* estates (of *Great Gatsby* fame) and FW's wife and three daughters spent most of their time there (FW was interested in the occult and some believe his spirit haunts the mansion). Hired as bookkeeper in 1892, *Hubert Parson* was FW's right-hand man and thought of by FW as the son he never had. In 1916, FW promoted him to *General Manager*. Notoriously vain, Parson attempted to outdo his benefactor; first by building a larger *Fifth Avenue* mansion and then, in 1918, he bought a house in *Long Branch, New Jersey* (named "Shadow Lawn") that was far larger than FW's Winfield Hall. FW hated going to the dentist (recalling W.H. Moore's death), a prejudice which led to his own death in April 1919 when he died suddenly from an infected tooth. He had left his will unsigned thus, all of his fortune (about \$30 million) went to his wife *Jennie*. However, *Jennie* had been declared "mentally feeble" (she was most probably suffering from Alzheimer's disease at the time) thus, she was declared legally incompetent. In 1917, daughter *Edna* committed suicide at the *Plaza Hotel* after learning of her husband's continued infidelity. She was discovered by her daughter; *Barbara*, who would go on to a troubled life of her own (she married seven times, most notably to *Cary Grant* in 1942) and was dubbed "Poor Little Rich Girl" by gossip columnists of the day.

205

F. W. WOOLWORTH, 5 AND 10 CENT STORE MAGNATE, DEAD

New York, April 8.—Frank W. Woolworth, who started a five and ten cent store at Utica, N. Y., 49 years ago, on a capital of \$40, and eventually became the millionaire president of a great chain of these stores in the United States, Canada and England, died suddenly early today at his country home at Glen Cove, Long Island.

In addition to establishing a business with profits said to be nearly \$1,500,000 yearly, Mr. Woolworth built the celebrated 51-story Woolworth building in lower New York, said to be the tallest building in the world.

He was born on a farm at Rodman, Jefferson county, N. Y., on April 11, 1872. Until he was 21 years old he worked on his father's farm, obtaining a meager education in the district school and later at a business college.

His first position was errand boy in a dry goods store, and gradually he was advanced until he became a clerk and salesman, at which time he married on a salary of \$125 per week.

He worked six years in the dry goods business in various stores before a successful bargain counter sale gave him the idea of the possibilities of making substantial profits from nicked and dime purchases. His idea when broached to his employers was termed visionary and he was advised to stick to "the old-fashioned" plan of conducting a store.

Nevertheless Woolworth was determined to test the plan, and his first venture was at Utica in 1878. He had but \$40 in cash and gave his personal note for the goods. In a year he had paid off his debt and saved some money. Closing out his store, he located at Lancaster, Pa., and established not only a store, but the foundation of his fortune.

His rapid rise from a small "penny-hole" store to the palatial Woolworth building in this city—with more than 400 branch stores in the United States, over 60 in Canada and England—forms one of the most interesting business romances in the history of the world. The business was incorporated several years ago for \$45,000,000.

In addition to being president of the firm of F. W. Woolworth & Co., he was the director of a number of banks and business enterprises here. He maintained a residence on Fifth avenue noted for its rare paintings.

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Most of the immediate Woolworth family (including FW) are buried in the ornate *Woolworth Mausoleum* in *Woodlawn Cemetery* in the *Bronx*. The mausoleum; a tribute to vast wealth and self-importance, was designed akin to an Egyptian temple by architect *John Russell Pope* who was best known for designing the *Jefferson Memorial* in *Washington D.C.*

207

The Last Buggy Whip Factory

208

"The variety store business disappeared in America. Woolworth was the last buggy whip factory."

Howard Davidowitz, Retail Consultant

RE: demise of the *F.W. Woolworth* chain of variety stores in the U.S. In the post-WWII years, millions of Americans fled the cities for a better life in suburbia. With this middle-class flight, *Main Street, U.S.A.* lost its best customers. A new retail model emerged starting in the 1950s; the shopping mall, which provided easy access by car and a host of retailers both large and small. Then came the "Big-Box" discounters like *Wal-Mart*, offering products similar to Woolworth's but at lower prices. It spelled the end of an era in American retailing. After closing 800 stores in the *United Kingdom* by the end of 2008, in January 2009 the *Shop Direct Group* announced plans to re-launch the *Woolworth U.K.* brand as an online retailer (it was launched in the summer of 2009).

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Woolworth closing down

Five-&-dime chain failed to buck cheap competition




"Woolworth, the venerable five-and-dime whose cheap items and cozy lunch counters have symbolized Main Street America for 117 years, is shutting down nationwide. Four-hundred F.W. Woolworth stores – including 61 in New York City – will be closed within three months, the company announced yesterday. The closings, amid brutal competition from retail giants like Wal-Mart, end a century old tradition of one-stop shopping in urban centers..."

New York Daily News, July 18th 1997

211

Everyone Was Rich

212



"If Woolworth isn't what made America great, it certainly made you feel great to be an American. In Woolworth, everyone was rich. What you saw, you could buy – and you always bought something...Fact is, everything in Woolworth looked friendly. Intimidation was left for the department store. This institution was so personable that upon hearing it would be shuttered after 117 dependable, five-and-dime years, almost everyone reacted as if a beloved old aunt had died...Enter the thick glass double doors and you could find everything you needed for a birthday party, a new apartment, the first day of school. You could even get your picture taken. And you did...With your dime-store Dresden you felt you owned a bit of beauty. You felt you knew how to shop. You felt you had the world at your fingertips, because you did. You had Woolworth."

New York Daily News, July 1997 213

"Even I was amazed!" - Susan Smart

YOU CHOOSE FROM MORE THAN 1000 SMART STOCKING GIFTS

AT Woolworth's TOILETRIES COUNTERS



"High on my list - these right gift ideas from Woolworth's"

BACON and TOMATO	50¢	PLAIN or TOASTED SANDWICHES	
Roasted Turkey Dinner Sandwich	40¢	MEAT SALAD Sandwich	30¢
BAKED HAM and CHEESE	40¢	EGG SALAD Sandwich	30¢
Roasted Turkey Dinner Sandwich	40¢	AMERICAN CHEESE Sandwich	30¢
CHEESY SALAD	45¢	PREPARED HAM Sandwich	30¢
MEAT SALAD and EGG SALAD	50¢		
Roasted Turkey Dinner Sandwich	40¢		

HOW A REAL TRADITION CAN BE KEPT ALIVE... YOU WILL LOVE IT! -40¢

Fountain Features

ICE CREAM	50¢	EXTRA RICH ICE CREAM SODA	75¢
SOFT ICE CREAM	50¢		
SOFT ICE CREAM	50¢		
SOFT ICE CREAM	50¢		

Woolworth's COFFEE - ALWAYS GOOD

214

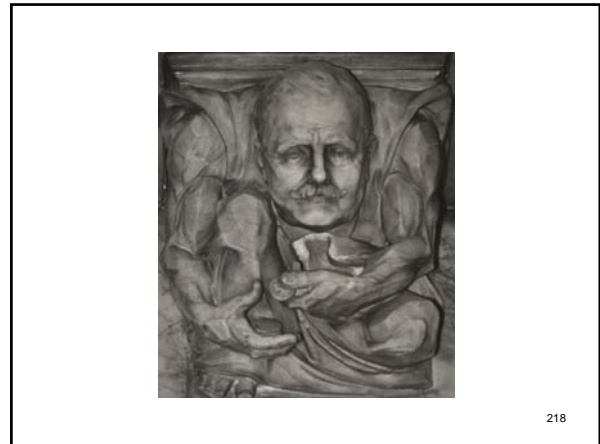
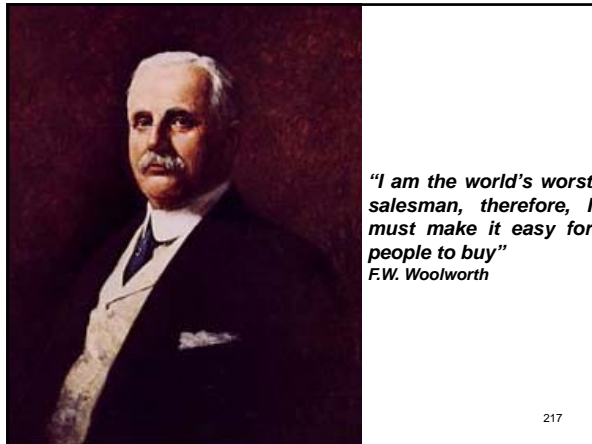


215

"Woolworth's next painful step will likely be the sale of its landmark headquarters building, one of Manhattan's most famous skyscrapers. Experts predicted yesterday that the company will put the 54-story tower up for bids now that it has decided to close its 118-year-old chain of variety store...Real estate experts said that the building could fetch as much as \$100 million. Now would be a good time for Woolworth to sell because the office market is rebounding...Woolworth has made plans to move its headquarters and some 2,000 employees out of the building. The company takes up about half the space in the tower. The rest is leased to small law firms and other businesses that like to be near City Hall."

New York Daily News, July 18th 1997

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Part 3

The Talented Mr. Gilbert

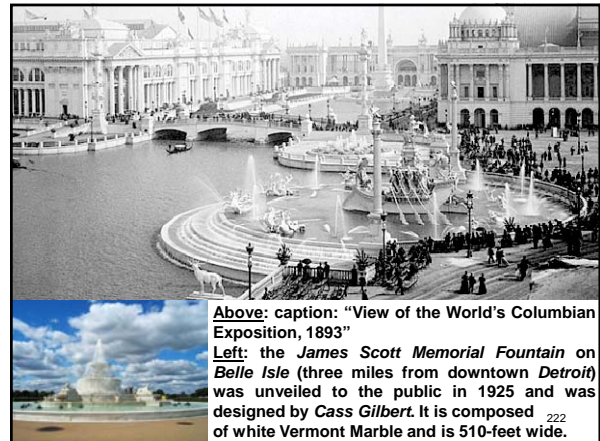
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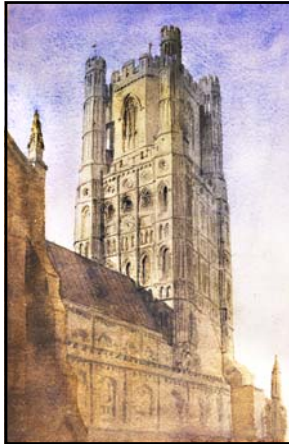
An American Interpretation

220

Architect Cass Gilbert was born in Zanesville, Ohio, in 1859. The Gilbert family moved to St. Paul, Minnesota in 1864 (Gilbert's father was a surveyor for the United States Coast Survey). In 1876, Gilbert began work at the office of a local architect; Abraham M. Radcliffe. He left Radcliffe's firm in 1878 to enroll in the architecture program at the Massachusetts Institute of Technology (MIT). Upon graduation in 1880, he went to Europe, seeking employment with a notable English architect. Failing to secure employment, he traveled briefly through France and Italy, studying Gothic Cathedrals mainly. On his return, Gilbert went work for the prestigious architectural firm of McKim, Mead & White. MM&W were exponents of an architectural style known as "Beaux-Arts," which emphasized classical Greek and Roman styles in art and architecture. The style was promoted through Paris' Ecole des Beaux-Arts, the "City Beautiful" movement (a North American style of architecture and city planning that focused on beauty and monumental grandeur) that was prominently on display in the neo-classical "White City" of the 1893 Columbian Exposition in Chicago's Jackson Park. Cass Gilbert was one of the few major architects of his era that did not study at the Ecole des Beaux-Arts. Rather, his formal architectural education and apprenticeships espoused an American interpretation of the principles of Beaux-Arts and City Beautiful influences in architecture.

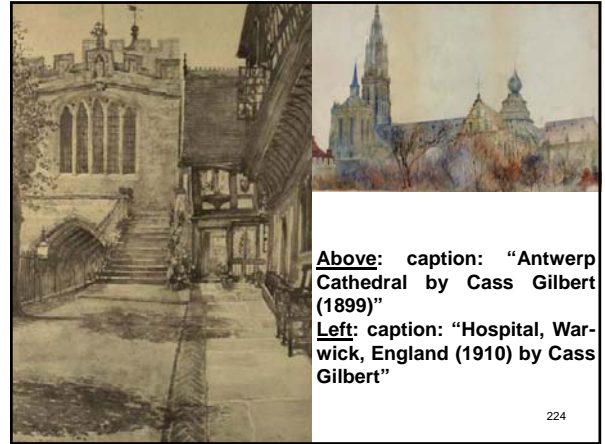
221





Left: caption: "Watercolor sketch of Ely Cathedral by Cass Gilbert, 1905." In stark contrast to many of his contemporaries who disdained the overt commercial nature of the skyscraper, Gilbert embraced the form. He was enamored of medieval spires and towers ever since his first trip to *Europe*. Gilbert admired them for both the romance of their picturesqueness and monumentality. This attraction can be clearly seen in his drawings and paintings done during his European travels.

223



Above: caption: "Antwerp Cathedral by Cass Gilbert (1899)"
Left: caption: "Hospital, Warwick, England (1910) by Cass Gilbert"

224



Above & Left: caption: "Personal rendering by Cass Gilbert. Enkhuisen, Dec 12, '97"

225



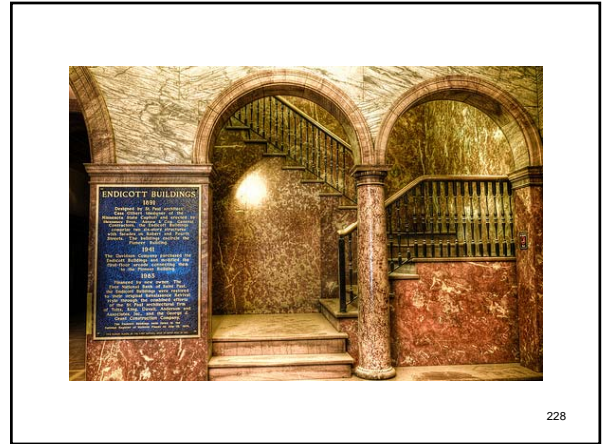
While at MM&W, Gilbert (left) served as Stanford White's assistant. Wanting to return to his native city, MM&W partner *William Rutherford Mead* suggested Gilbert set up a branch office in *St. Paul*. Instead, in 1882, he returned to *St. Paul* and set up a partnership with fellow MIT alumnus *James Knox Taylor*. During their eight year partnership, the firm completed a number of commissions in *Minnesota* including residences, churches and office buildings; mostly in the "Shingle" or "Richardson Romanesque" style/s. Most noteworthy was the *Endicott Building*, which gained the partners much acclaim. By the early 1890s, Gilbert had become a prominent architect in *Minnesota* serving as president of the state's AIA chapter and as a juror on several important design competitions (i.e. *New York Public Library*).

226

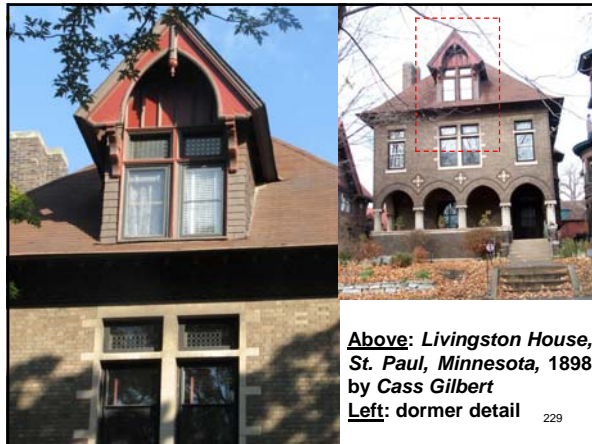


Left: the *Endicott Building* at 141 East Fourth Street in *St. Paul, MN* offered *Cass Gilbert* his first opportunity to employ elements of his beloved *Italian Renaissance* style on a large scale. The building's elegant design, large size and high standard of construction made it the premier office building in *St. Paul*. The exterior features a granite base, brownstone facing (on the first floor) and pressed brick above. The cornice is made of terra cotta. An important feature of the *Endicott Building* is the presence of an arcade of shops on street level - a forward-looking design (Arcades were incorporated in a number of Gilbert's later office buildings, including *Woolworth*). The *Arcade* is lavishly detailed in exotic colored marbles, stained glass and stone mosaic floor tile.

227

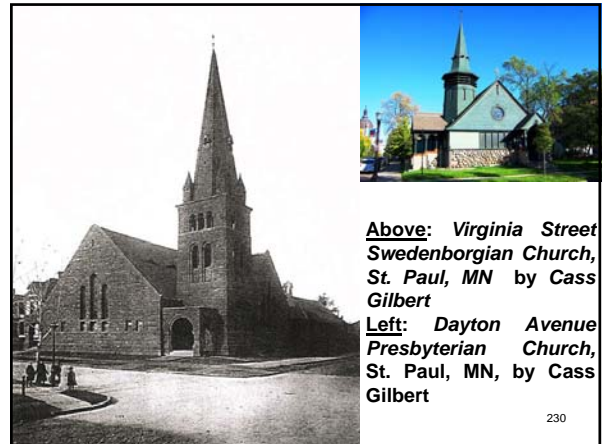


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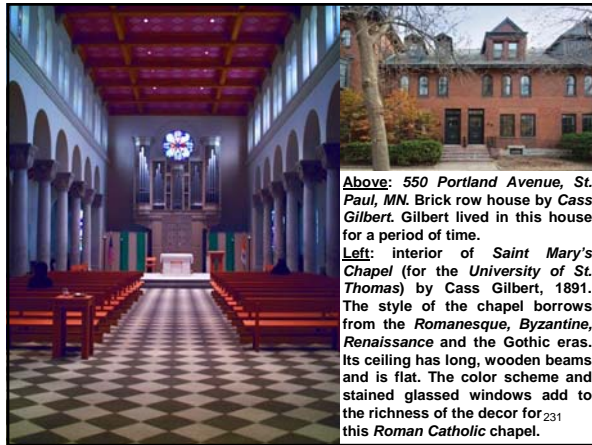
Above: Livingston House, St. Paul, Minnesota, 1898 by Cass Gilbert
Left: dormer detail

229



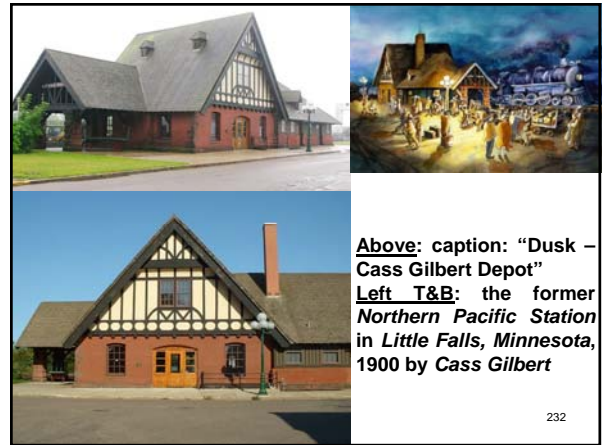
Above: Virginia Street Swedenborgian Church, St. Paul, MN by Cass Gilbert
Left: Dayton Avenue Presbyterian Church, St. Paul, MN, by Cass Gilbert

230



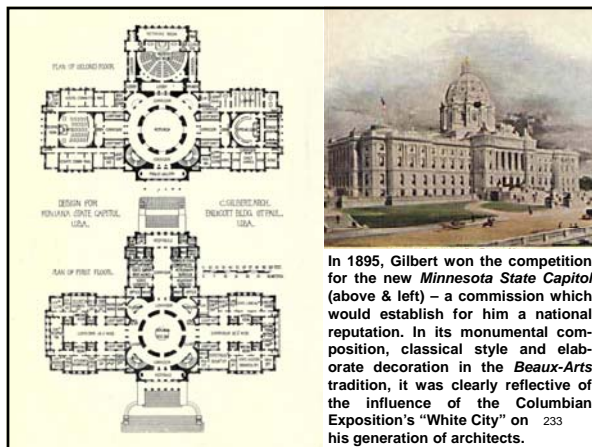
Above: 550 Portland Avenue, St. Paul, MN. Brick row house by Cass Gilbert. Gilbert lived in this house for a period of time.
Left: interior of Saint Mary's Chapel (for the University of St. Thomas) by Cass Gilbert, 1891. The style of the chapel borrows from the Romanesque, Byzantine, Renaissance and the Gothic eras. Its ceiling has long, wooden beams and is flat. The color scheme and stained glassed windows add to the richness of the decor for this Roman Catholic chapel.

231



Above: caption: "Dusk – Cass Gilbert Depot"
Left T&B: the former Northern Pacific Station in Little Falls, Minnesota, 1900 by Cass Gilbert

232



In 1895, Gilbert won the competition for the new Minnesota State Capitol (above & left) – a commission which would establish for him a national reputation. In its monumental composition, classical style and elaborate decoration in the Beaux-Arts tradition, it was clearly reflective of the influence of the Columbian Exposition's "White City" on his generation of architects.

233



Above: the Minnesota State Capitol, St. Paul, MN
Left: close-up view of the Minnesota State Capitol's dome

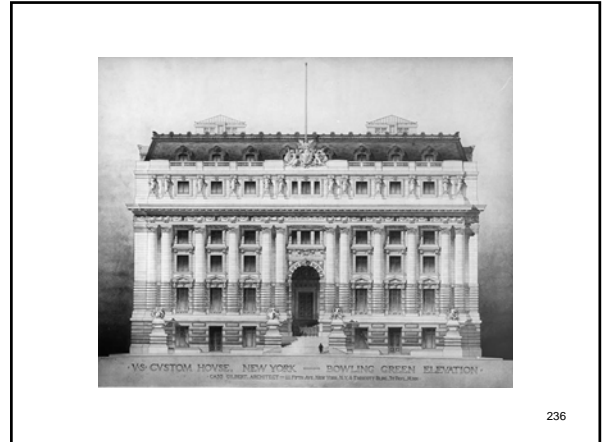
234



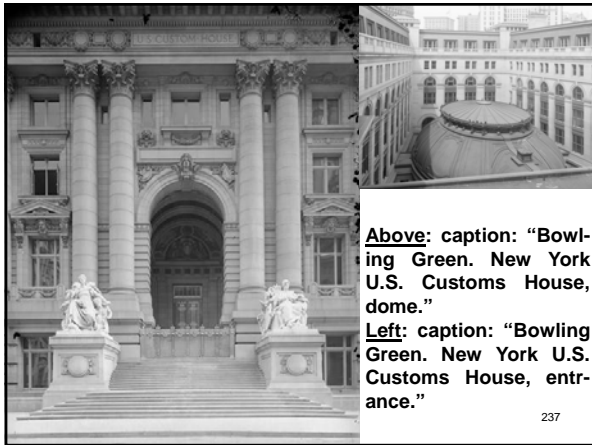
"The decorations of the interior will illustrate the commerce of ancient and modern times, both by land and sea; thus providing a series of themes of great pictorial interest appropriate to the structure"

Cass Gilbert, Architect

RE: interior decorations of the U.S. Customs House (left). On the heels of the Minnesota State Capitol commission, in 1899 Gilbert entered a competition for the design of the new U.S. Customs House at One Bowling Green in NYC (right). Completed in 1907, the building combined *Beaux-Arts* with *City Beautiful* to great effect. Cass Gilbert was now firmly established as one of the city's premier architects. In 1900, he took up permanent residence. Cass Gilbert believed public buildings should, first and foremost, serve the public and, in this regard, justified any expenditure necessary to make them beautiful. As such, his²³⁵ public buildings spared no expense, being lavishly decorated and given the "artist's touch."



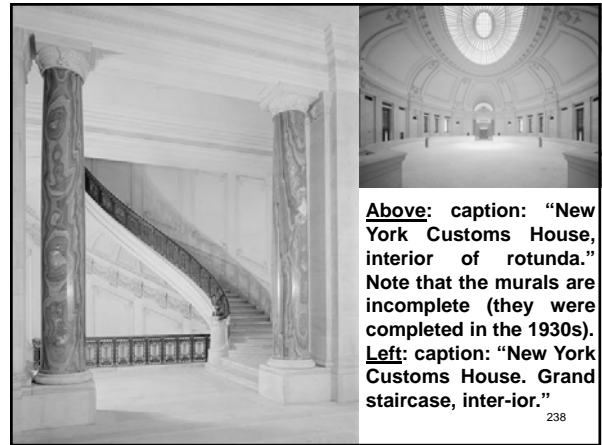
236



Above: caption: "Bowling Green. New York U.S. Customs House, dome."

Left: caption: "Bowling Green. New York U.S. Customs House, entrance."

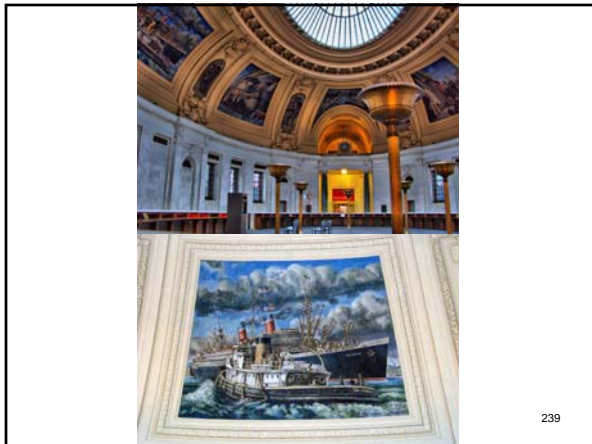
237



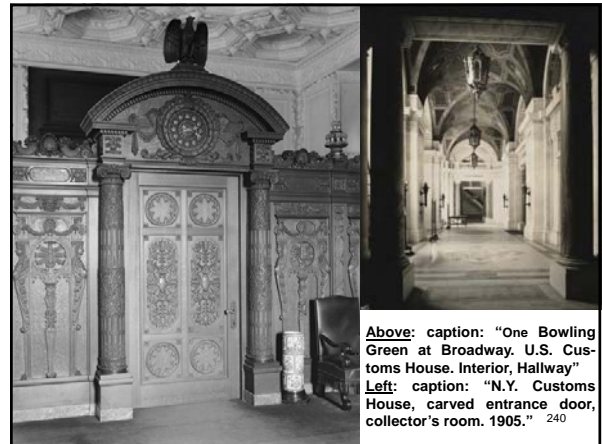
Above: caption: "New York Customs House, interior of rotunda." Note that the murals are incomplete (they were completed in the 1930s).

Left: caption: "New York Customs House. Grand staircase, interior."

238




239



Above: caption: "One Bowling Green at Broadway. U.S. Customs House. Interior, Hallway"

Left: caption: "N.Y. Customs House, carved entrance door, collector's room. 1905." ²⁴⁰

240

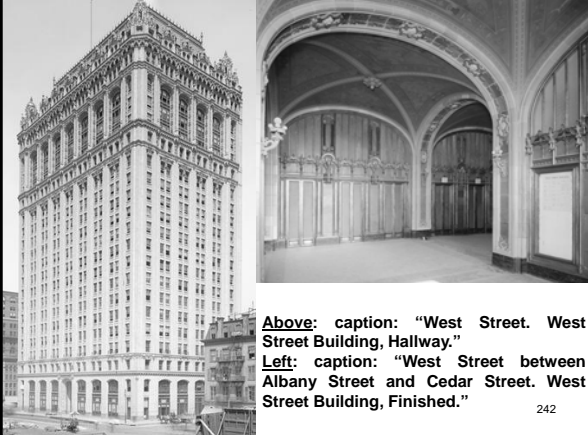


Once established in NYC, Gilbert went on to design similar *Beaux-Arts* style governmental buildings including, among others:

- the *Detroit Public Library* (1914);
- the *West Virginia State Capitol* (Charleston, 1932);
- the *United States Supreme Court Building* (Washington, D.C., (1935), and;
- the *New York Federal Courthouse* (Manhattan, 1934)


The other part of Gilbert's portfolio of commissions was made up of private commissions, in particular office buildings. The *Brazer Building* of Boston (1896) and the *Broadway-Chambers Building* (1900, at left) were of the tripartite "base-shaft-capital" style espoused by Chicago architect *Louis Sullivan*. The *West Street Building* (1907) had elements of the tripartite while, with its Gothic facades, emphasized the verticality of the structure. In its Gothic details and emphasis on the vertical, it would be the direct predecessor of Gilbert's *Woolworth Building*.

241




Above: caption: "West Street. West Street Building, Hallway."
Left: caption: "West Street between Albany Street and Cedar Street. West Street Building, Finished."

242




243



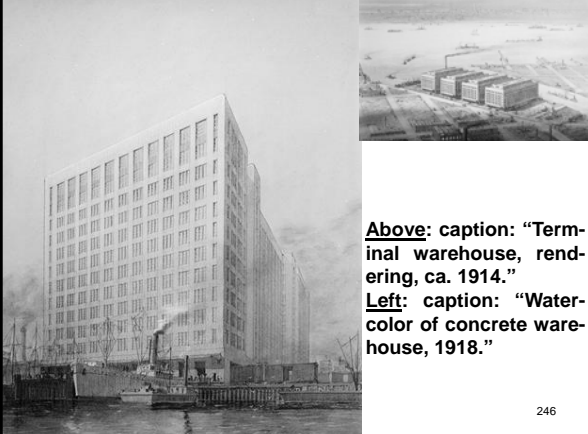
Above: caption: "One East 51st Street at 6th Avenue. Union Club, ca. 1905."
Left: caption: "Watercolor Perspective rendering of 28-story building, ca. 1912."

244



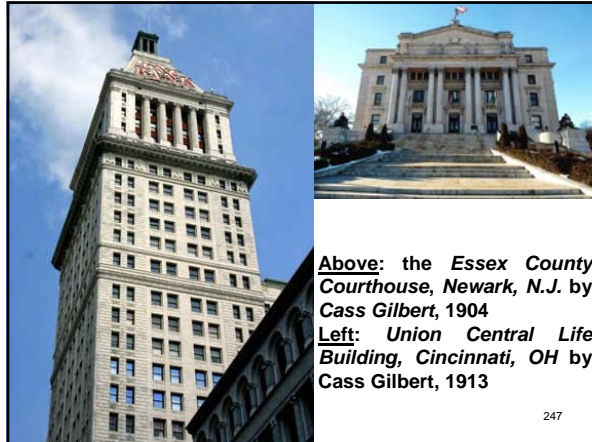
Above: caption: "Proposed Fine Arts Building, elevation. 10/11/16"
Left: caption: "Madison Square Garden design, view with tall tower, rendering by Hugh Ferriss. 12/15/1919."

245



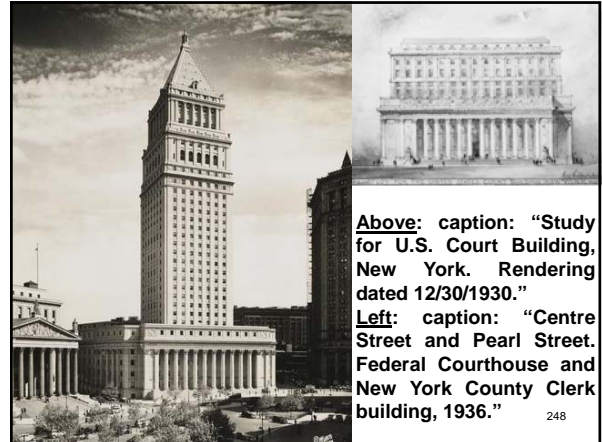
Above: caption: "Terminal warehouse, rendering, ca. 1914."
Left: caption: "Watercolor of concrete warehouse, 1918."

246



Above: the *Essex County Courthouse, Newark, N.J.* by *Cass Gilbert, 1904*
Left: *Union Central Life Building, Cincinnati, OH* by *Cass Gilbert, 1913*

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Above: caption: "Study for U.S. Court Building, New York. Rendering dated 12/30/1930."
Left: caption: "Centre Street and Pearl Street. Federal Courthouse and New York County Clerk building, 1936."

248



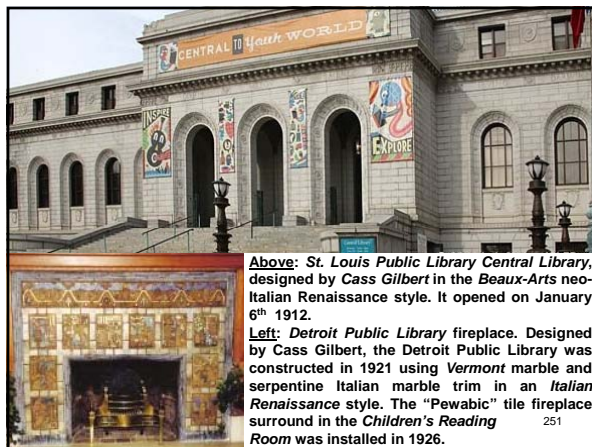
Above Top: the *Detroit Public Library*
Above Bottom: the *Central Public Library, St. Louis, MO*
Left: the *West Virginia State Capitol Building, Charleston W.V.*

249



Above: the *Arkansas State Capitol, Little Rock, AK* by *Cass Gilbert, 1899*
Left: *West Virginia State Capitol, Charleston, WV* by *Cass Gilbert, 1925*

250



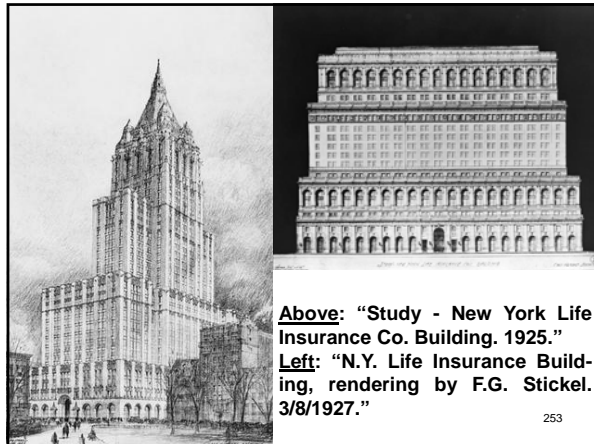
Above: *St. Louis Public Library Central Library*, designed by *Cass Gilbert* in the *Beaux-Arts neo-Italian Renaissance style*. It opened on *January 6th 1912*.
Left: *Detroit Public Library fireplace*. Designed by *Cass Gilbert*, the *Detroit Public Library* was constructed in *1921* using *Vermont marble* and *serpentine Italian marble trim* in an *Italian Renaissance style*. The "Pewabic" tile fireplace surround in the *Children's Reading Room* was installed in *1926*.

251



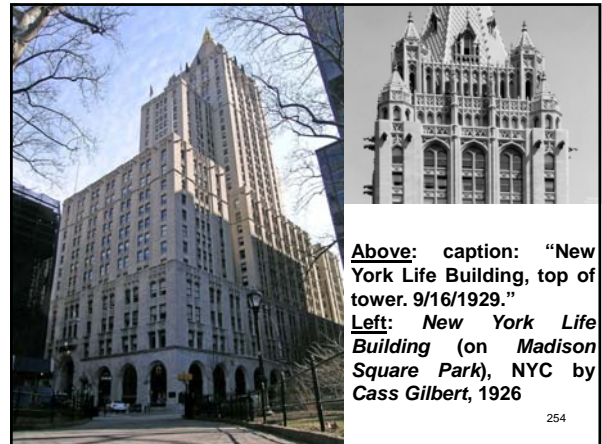
Above & Left: *United States Supreme Court Building, Washington D.C.*

252



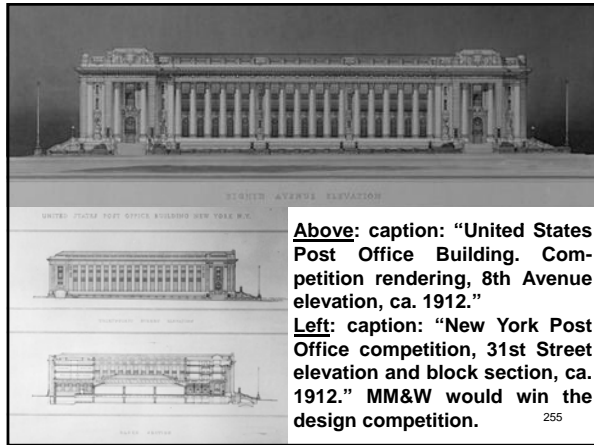
Above: "Study - New York Life Insurance Co. Building. 1925."
Left: "N.Y. Life Insurance Building, rendering by F.G. Stickel. 3/8/1927."

253



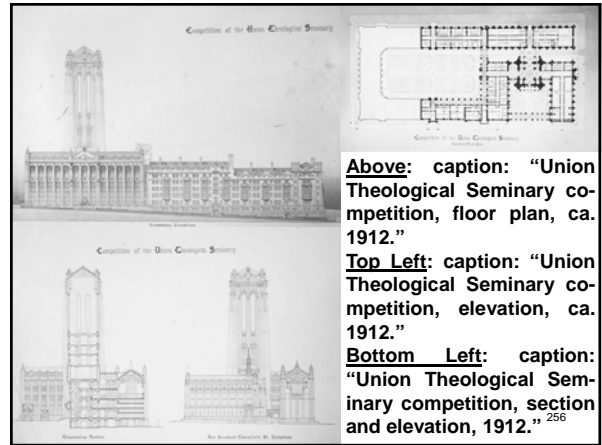
Above: caption: "New York Life Building, top of tower. 9/16/1929."
Left: *New York Life Building* (on Madison Square Park), NYC by Cass Gilbert, 1926

254



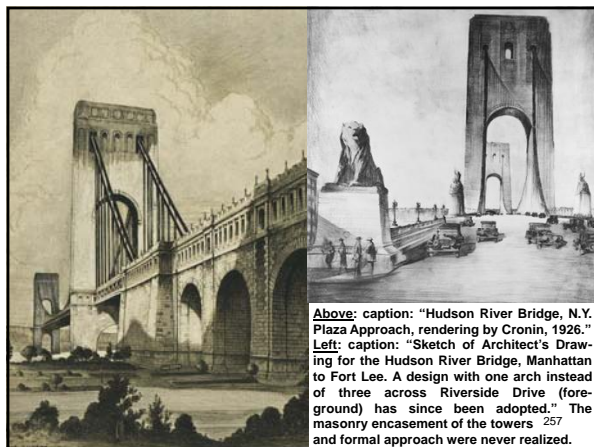
Above: caption: "United States Post Office Building. Competition rendering, 8th Avenue elevation, ca. 1912."
Left: caption: "New York Post Office competition, 31st Street elevation and block section, ca. 1912." MM&W would win the design competition.

255



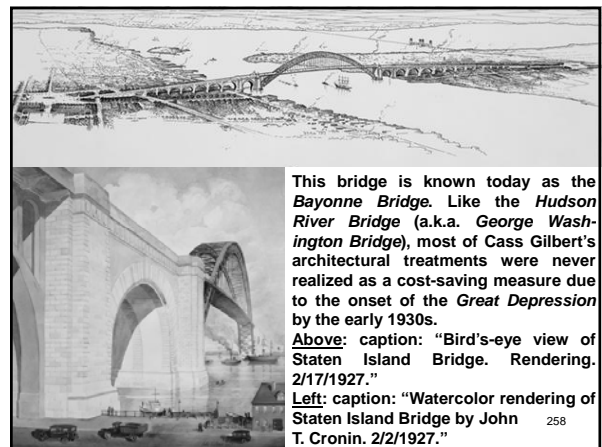
Above: caption: "Union Theological Seminary competition, floor plan, ca. 1912."
Top Left: caption: "Union Theological Seminary competition, elevation, ca. 1912."
Bottom Left: caption: "Union Theological Seminary competition, section and elevation, 1912."

256



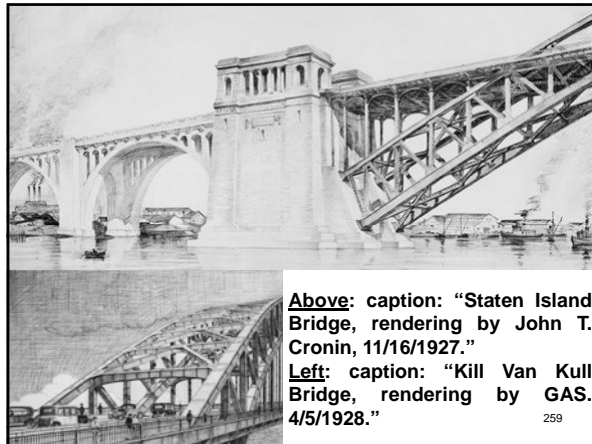
Above: caption: "Hudson River Bridge, N.Y. Plaza Approach, rendering by Cronin, 1926."
Left: caption: "Sketch of Architect's Drawing for the Hudson River Bridge, Manhattan to Fort Lee. A design with one arch instead of three across Riverside Drive (foreground) has since been adopted." The masonry encasement of the towers and formal approach were never realized.

257



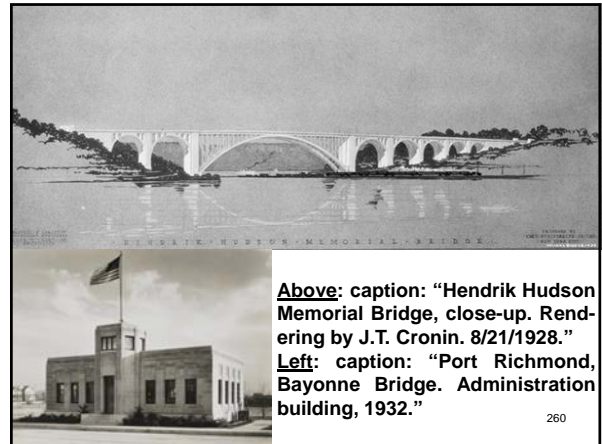
This bridge is known today as the Bayonne Bridge. Like the Hudson River Bridge (a.k.a. George Washington Bridge), most of Cass Gilbert's architectural treatments were never realized as a cost-saving measure due to the onset of the Great Depression by the early 1930s.
Above: caption: "Bird's-eye view of Staten Island Bridge. Rendering. 2/17/1927."
Left: caption: "Watercolor rendering of Staten Island Bridge by John T. Cronin. 2/2/1927."

258



Above: caption: "Staten Island Bridge, rendering by John T. Cronin, 11/16/1927."
Left: caption: "Kill Van Kull Bridge, rendering by GAS. 4/5/1928."

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Above: caption: "Hendrik Hudson Memorial Bridge, close-up. Rendering by J.T. Cronin. 8/21/1928."
Left: caption: "Port Richmond, Bayonne Bridge. Administration building, 1932."

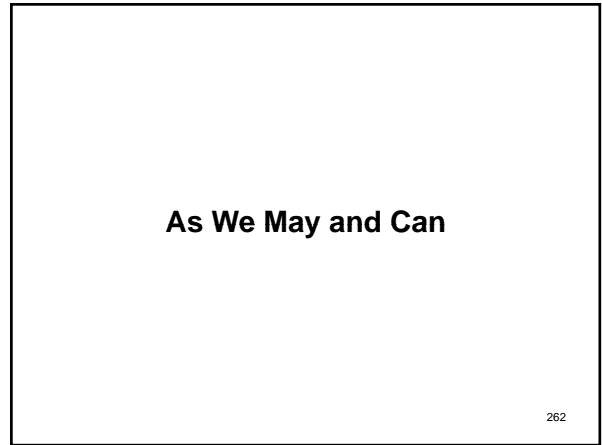
260



When FW and Gilbert met (in Dec. 1910) to discuss the contract to design a skyscraper, FW was impressed by Gilbert's straight-forward manner. At their meeting, the architect drew a sketch of the *Woolworth Building*. FW awarded the commission to Gilbert based on his sketch and a rough cost estimate.

Left: caption: "Cass Gilbert. Study for the Woolworth Building, New York City. Sketch elevation. December 31, 1910."

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As We May and Can

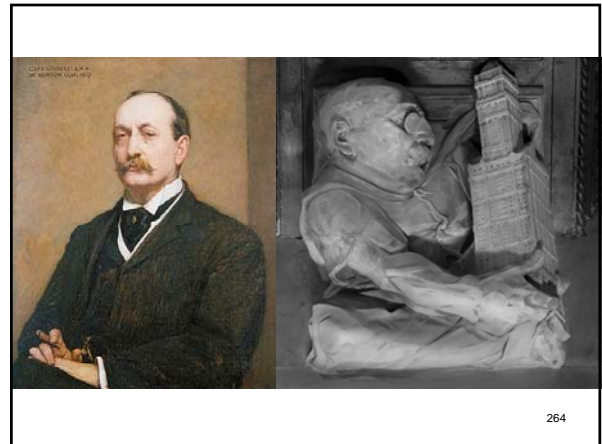
262



"...as in language new words are coined to express new meanings and old words become obsolete, as old uses are abandoned so new forms to meet new needs are developed as the necessity requires. This does not mean that one should ignore the culture, the knowledge and experience of the past to willfully and proudly discard all that has gone before and start all over at the beginning. It is not progress to go backward...Why not then pick up the threads where we find them and weave into the pattern of our own civilization the beauty that is our inheritance? My plan therefore is for beauty and sincerity, for the solution of our own problems in the spirit of our own age illuminated by the light of the past; to carry on, to shape new thoughts, new hopes and new desires in new forms of beauty as we may and can; but to disregard nothing of the past that may guide us in doing so...It is in this spirit that the building you have chosen was designed."

Cass Gilbert, Architect
 RE: excerpts from his speech upon receiving the Gold Medal of Architecture from the Society of Arts and Sciences in honor of the Woolworth Building's design (in 1931)

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264

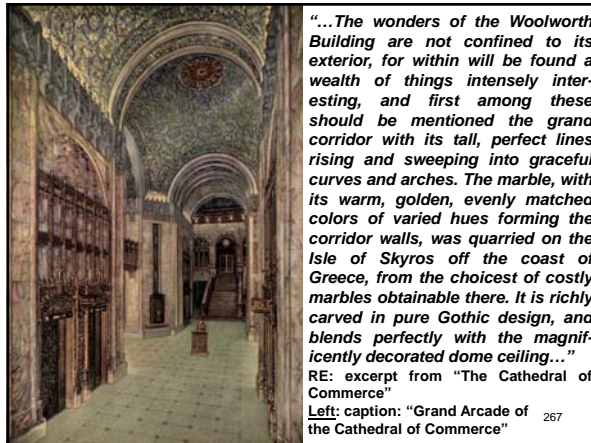
Part 4

A Wealth of Interesting Things

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The Wonders of the Woolworth Building

266



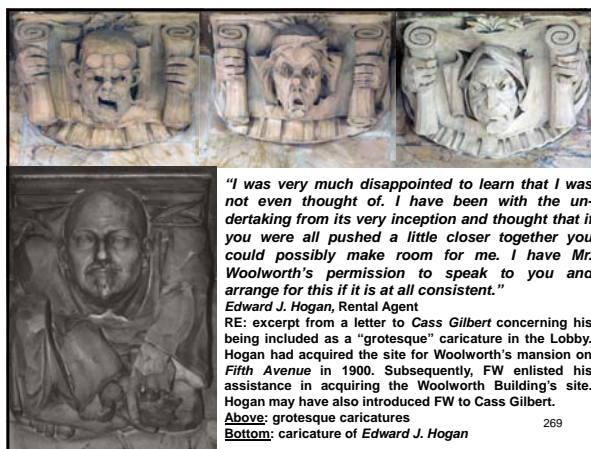
“...He was passionately fond of beauty in architecture and earnestly desired that his building which bears his name should add to the beauty of New York...”

Cass Gilbert, Architect

RE: Gilbert’s theories of adornment for public buildings are in evidence in the elaborate decoration of the Arcade and Hall spaces on the Ground Floor of the Woolworth Building. Fine marbles line the walls, Gothic bronze tracery is used on the elevator doors and mailboxes, a stained glass ceiling illuminates the space of the Grand Staircase, sculpted grotesques, exquisite abstract floral mosaics (reminiscent of early Christian designs) grace the vaulted ceilings and domes high above, painted triptychs (over the north-south corridor of the Arcade) adorn the Mezzanine and bronzed salamanders ascend the elevator door jambs. Gilbert’s Minnesota State Capitol included referenced to law and history in its interior decorative scheme while the U.S. Customs House made reference to ports and shipping. For the Woolworth Building, the glories of commerce and finance – reflective of the values of both the F.W. Woolworth Company and the Irving National Bank – would take center stage. The painted triptychs portray allegorical figures of “Commerce” and “Labor” and are the work of Paul Jenewein. The stained glass ceiling in the Bank Hall is decorated with the coats-of-arms of great commercial nations. The grotesque figures supporting the arcade galleries are the work of Thomas R. Johnson. Not only would the building’s owner and architect be caricatured, but also the Structural Engineer (Gunvald Aus), General Contractor (Louis Horowitz), Irving Bank President (Lewis Pierson) and, belatedly, the rental agent (Edward J. Hogan). Most of the detailed Lobby decoration is Gothic in inspiration. The space is divided into three main sections:

- an Arcade (consisting of two crossing corridors at the eastern end);
- a Marble Staircase Hall (at center), and;
- a smaller hall west of the Marble Staircase Hall (retail shops open into both halls)

268

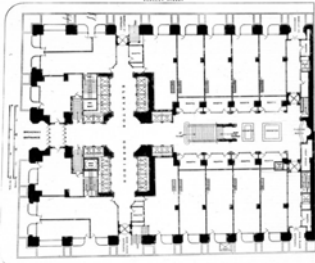


“Delightfully gay exaggerations without being the least unkind”

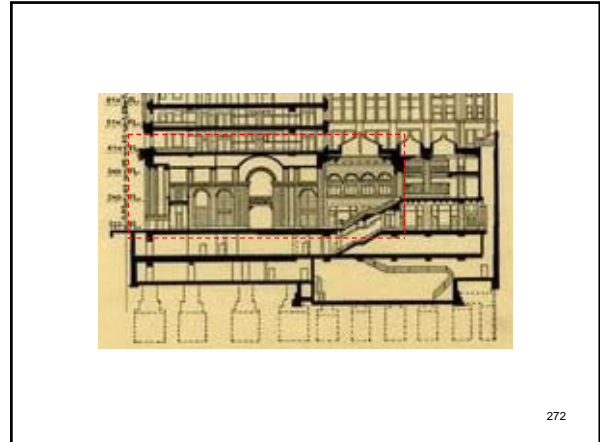

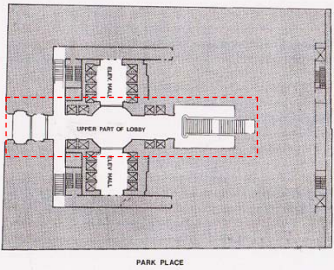
RE: an architectural critic’s opinion of the grotesque corbel caricatures found in the Arcade. The caricatures were based on sketches created by Gilbert’s lead designer Thomas R. Johnson and are meant to represent each individual who contributed to the realization of FW’s dream. Though Cass Gilbert was given much of the credit for his choice of collaborators, in turn he paid tribute to his client’s enthusiasm for the project which became infectious. He said of FW: “he enlisted the enthusiasm of all connected with the work.” FW foresaw that tourists from all over the world would visit the Lobby. For this reason, he required of his architect that he use every imaginable aesthetic device (corbel caricatures included) to heighten the Woolworth Building’s curb appeal and, therefore, F.W. Woolworth Co. name recognition.

270

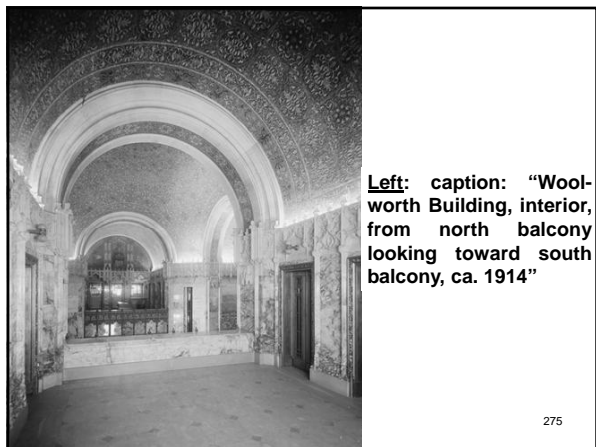
The Arcade is formed by two crossing passageways, one leading east-to-west from the main (*Broadway*) entrance to the *Marble Staircase Hall* (a.k.a. "Marble Hall") and the other runs north-to-south, connecting the secondary entrances (*Park Place* and *Barclay Street*). Each passageway is two stories high and barrel vaulted, meeting at a central crossing. However, the north and south wings include an open *Mezzanine Level* dividing each wing into an upper gallery (visible from the *Ground Floor*) and a lower hall. Entry to the Arcade is gained through a one-storey high entrance vestibule on *Broadway*. Just beyond the vestibule, on either side, is a staircase leading to the *Mezzanine Level*. The east and west walls of the Arcade are divided into two round-arched bays by marble piers forming ribs in the ceiling. Within these bays are located the passenger elevator banks. The western end of the Arcade opens onto the *Marble Staircase Hall*.



271
 Left: caption "Street Level Plan"

273
 Above: caption: "Mezzanine Level plan" - showing the upper part of the Arcade's *Main Hall* (left) and *Marble Staircase Hall* (right)
 Left: caption: "Broadway Entrance - Woolworth Building, New York. Cass Gilbert, F.A.I.A., Architect"



Majestic Embellishment

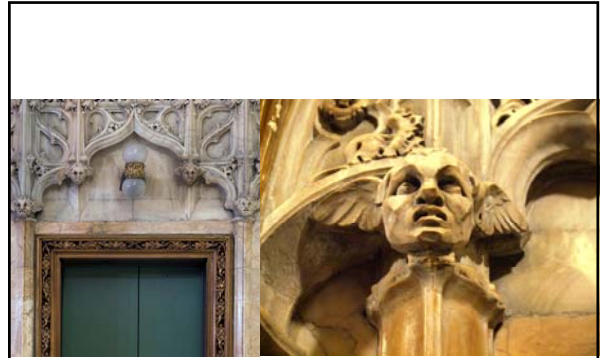
276



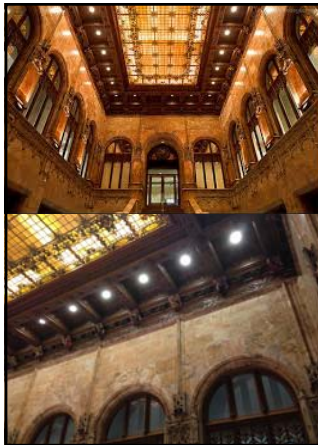
"...No cultured visitor to the Woolworth Building will fail to admire the polished and carved blocks and beautiful carvings of exquisitely colored and shaded marbles. The richness of the marble wainscoting, the paneling of the walls and the Gothic carving must impel an impression of lavish expenditure as well as unusual artistic advancement and determination to outrank all other buildings in majestic embellishment..."

277

RE: excerpt from "The Master Builders"



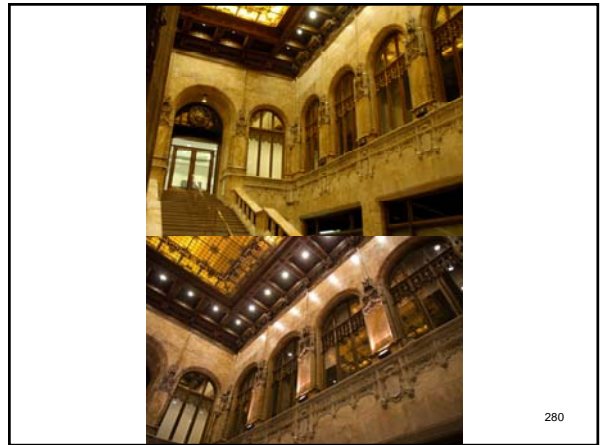
278



"...There are over 700 steps in the stairways, and it is worth while for an American, especially, to walk up and admire the marble product of the United States. All the qualities of famous Italian marbles are to be found in the marbles of Vermont, which substantially adorn the wainscots or the walls of the Woolworth. The deep, warm colors, the variety of shades and delicate tints are all there. Green Vein Cream Pannazzo marble and American Siena from the Eastman quarries of West Rutland, Vermont..."

RE: excerpt from "The Master Builders"

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280

"...The marble was furnished by Tompkins-Kiel Marble Company, of New York City. The carving was executed by Wm. Bradley & Son, of Long Island City; the marble was polished by them and, in fact, the marble throughout the building was selected and the work executed by them...This vast quantity of marble, so skillfully worked, and erected in contract time, speaks well for the efficiency of the plant and organization of William Bradley & Son..."

RE: excerpt from "The Master Builders"

281



"...The marble worker knows the quality of marble by its polish, its compactness and the way it holds the arris in carving. The Gothic carvings in the main corridor will bear the scrutiny of the critic, the polish is almost dazzling and the arris is perfect, while the marble itself laughs with ripples of exquisite green shades on a sea of delicate cream yellow..."

RE: excerpt from "The Master Builders"

282



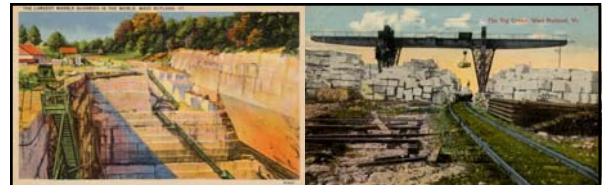
283



284

Opaline in its Play of Colors

285



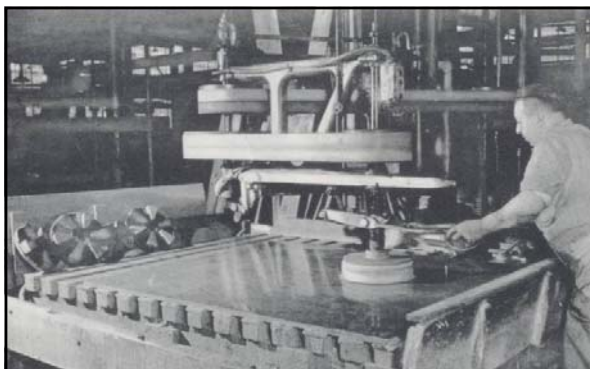
"...Vermont possesses the largest marble quarries in the United States, if not the largest in the world. Fifty years ago the quarries of Rutland were operated by ox teams and hand work of the crudest form, but half a century has wrought a remarkable change. The vast quarries there are now as much alive with modern machinery and appliances as the busiest Italian quarries at Carrara. Electric cranes and derricks move the huge blocks of marble in every direction, and channellers are busy dividing huge blocks for shipment. One of the finishing rooms at the Rutland marble quarries is 1,000 feet long, and contains scores of gang saws cutting up the marble into various shapes..."

RE: excerpt from "The Master Builders"

Left: caption: "The Largest Quarries in the World, West Rutland, VT"

Right: caption: "The Big Crane, West Rutland, VT"

286



Above: caption: "Polishing marble slab - Center Rutland, Vermont"

287



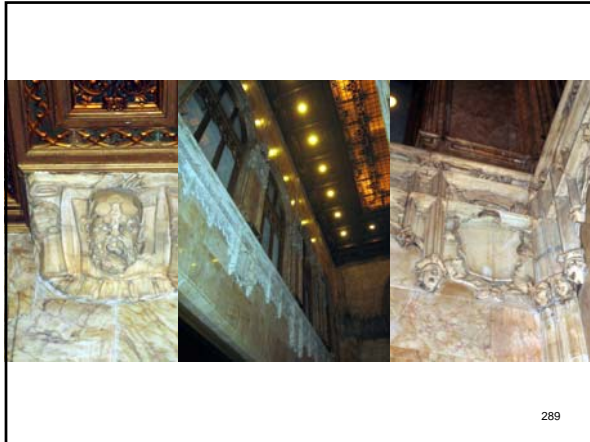
"...The most beautiful Paonazzo marble is recorded by the Romans as 'opaline in its play of colors.' Doubtless, if the Romans had seen the beautiful Green Vein Cream Paonazzo marble of the Eastman quarries of West Rutland, they would have counted it among their valued products. The America Siena from the Eastman quarries also rivals the famous Giallo de Siena in variety of shades and depth of color..."

RE: excerpt from "The Master Builders"

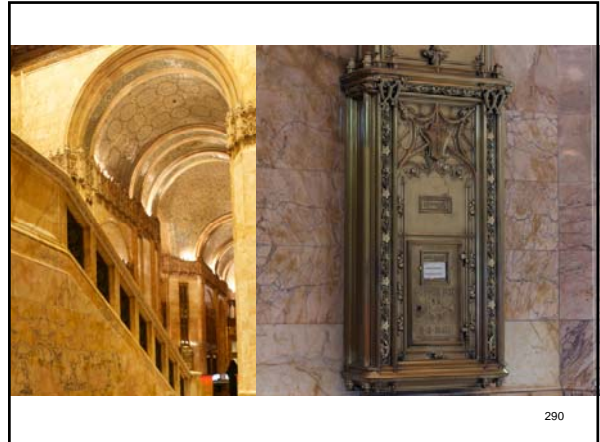
Left: caption: "Paonazzo Polished Marble"

Right: caption: "Polished Giallo Siena Marble Slab"

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289



290

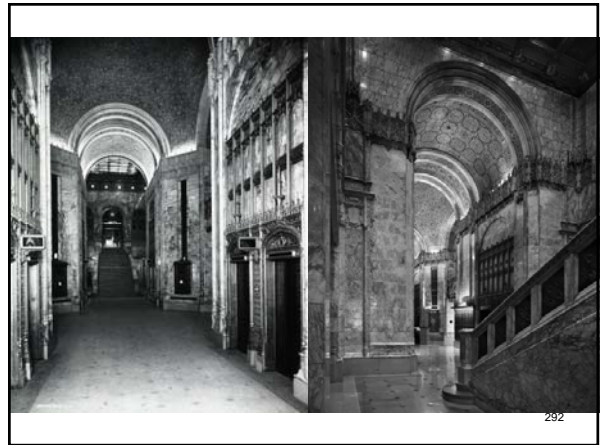


"...It is impossible to visit the Woolworth Building without stopping to admire the exquisite beauty of the main approach to the interior. At the end of the corridor, opposite the Broadway entrance, is a marble staircase leading to the Irving National Bank. The beautiful marble carvings are Greek in design and executed with marvelous skill. The ornamental metal work is principally wrought iron, covered with pure gold. William Bradley & Son executed the marble in the main hall and in Irving Bank..."

RE: excerpt from "The Master Builders"

Left: caption: "Grand Arcade From Main Stairway Looking Toward Broadway"

291

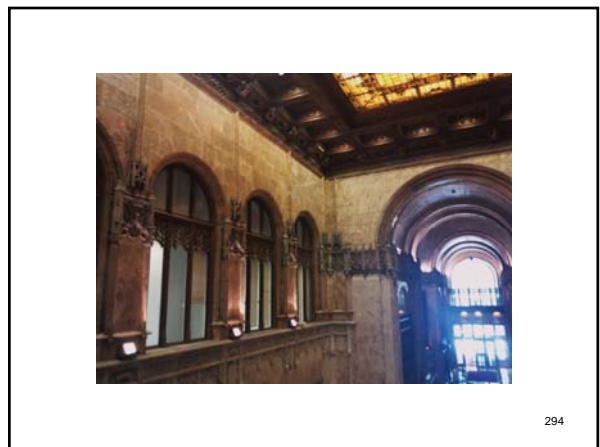


292

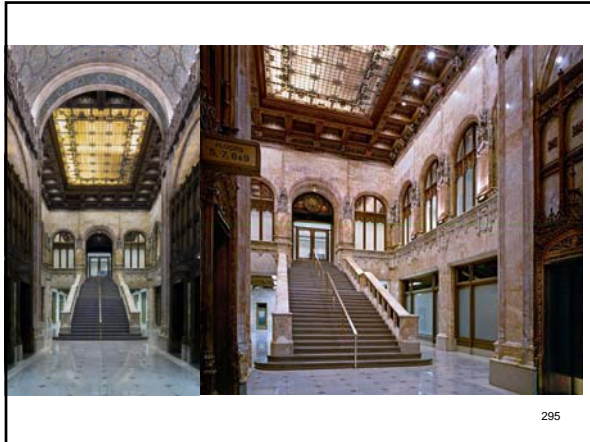


The Marble Staircase Hall is a two-storey rectangular room with storefronts on the lower level and arched windows above. The storefronts are rectangular with rounded corners with metal surrounds cast in Gothic motifs. The Grand Staircase rises from the center of the hall to the eastern end of the Mezzanine Level where the formal entrance to the Irving National Bank was located (a large bronze clock above the bank's entry draws attention to the apex of the staircase). Like the Arcade, the walls are lined with marble of various hues, quarried on the Greek island of Skyros. So too, the stone cornice from the Arcade is carried onto the eastern wall of Marble Hall, continuing as bronze filigree across the second floor windows (left). The windows are separated from the lower level by a bronze course with Gothic filigree and costs-of-arms. All windows and doors are trimmed in bronze. Rising two levels, the staircase has marble banisters set with cast-bronze panels.

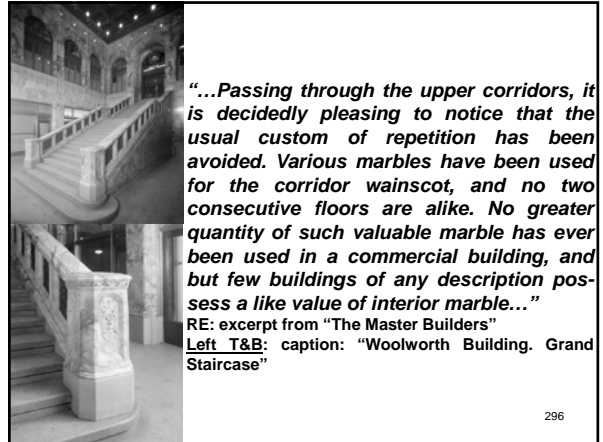
293



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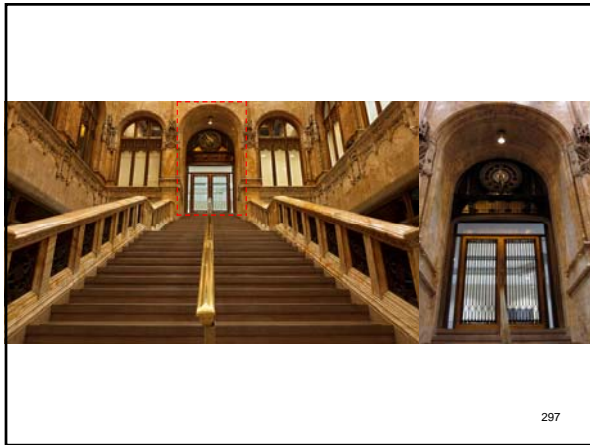
295



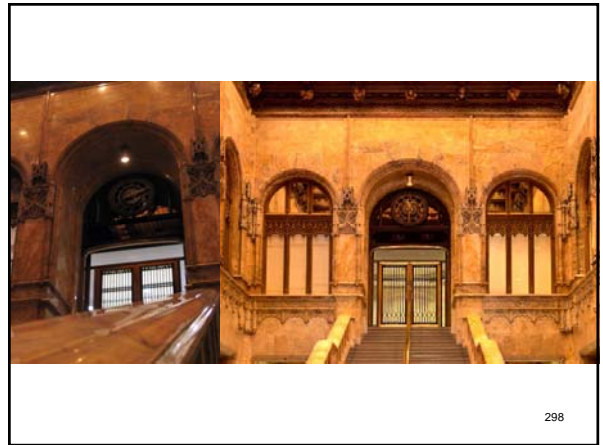
"...Passing through the upper corridors, it is decidedly pleasing to notice that the usual custom of repetition has been avoided. Various marbles have been used for the corridor wainscot, and no two consecutive floors are alike. No greater quantity of such valuable marble has ever been used in a commercial building, and but few buildings of any description possess a like value of interior marble..."

RE: excerpt from "The Master Builders"
 Left T&B: caption: "Woolworth Building, Grand Staircase"

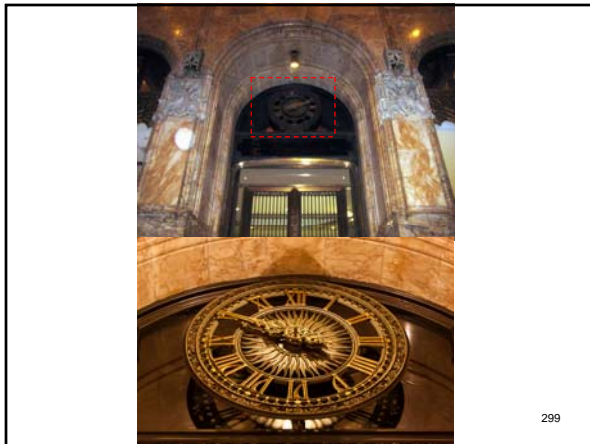
296



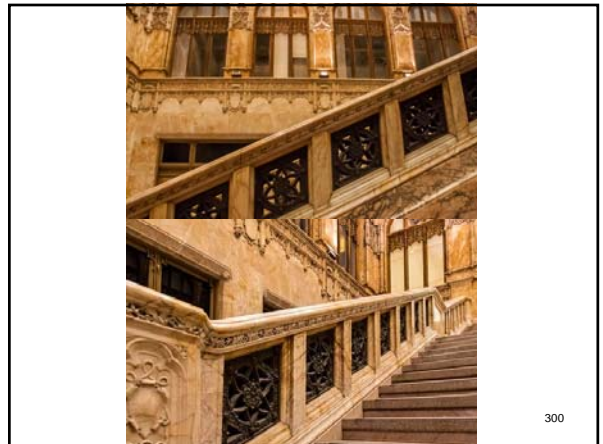
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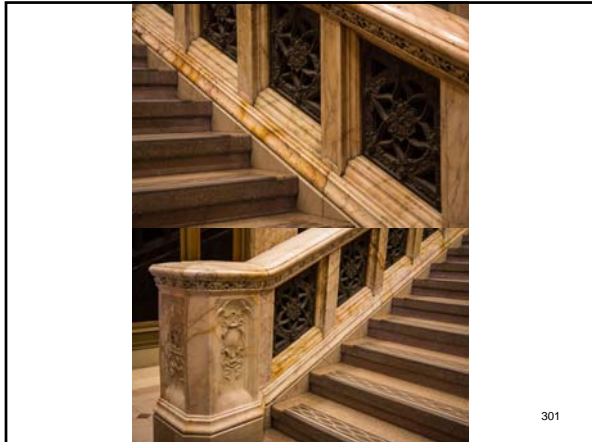
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299



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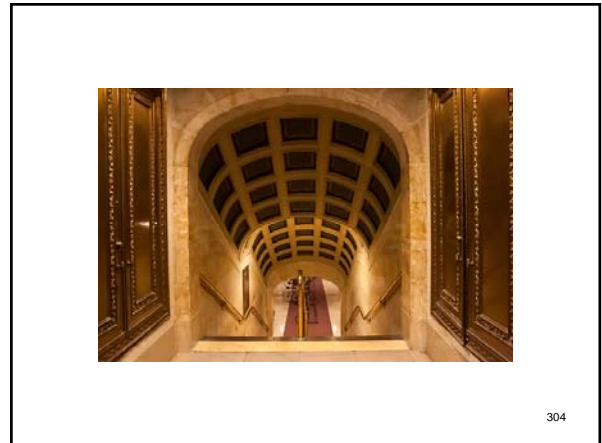
301



302

"...The plastering, decorative and plain, throughout the Woolworth Building was executed by H.W. Miller, Inc. It is doubtful whether a contract covering such a large extent of surface has ever been made with any one firm of plasterers before. Over two and one-half million square feet of surface had to be covered, involving six million pounds of gypsum plaster...The work ranged from plain surfaces, sand or stone finish, throughout the various moldings, paneling, embellishments and decorative pieces of fine detail, to the gorgeous domes and ceilings of hallways, the Irving Bank and the vaulted ceiling of the rathskeller and the ceiling of the grand entrance corridor..."
 RE: excerpt from "The Master Builders"

303



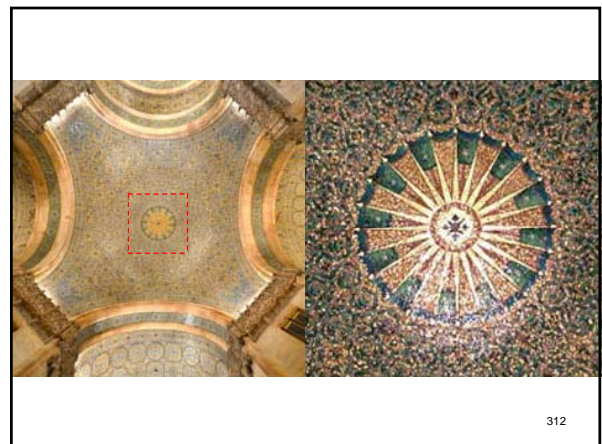
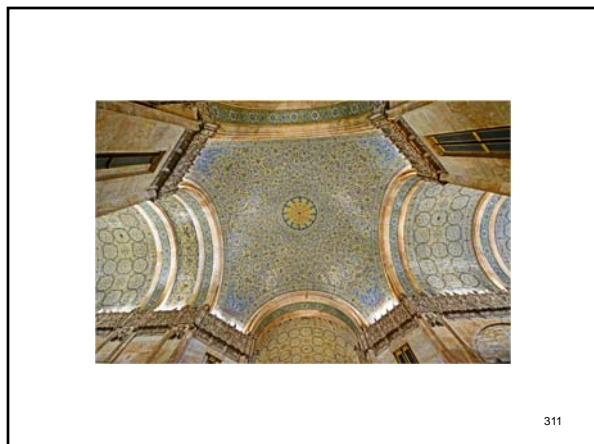
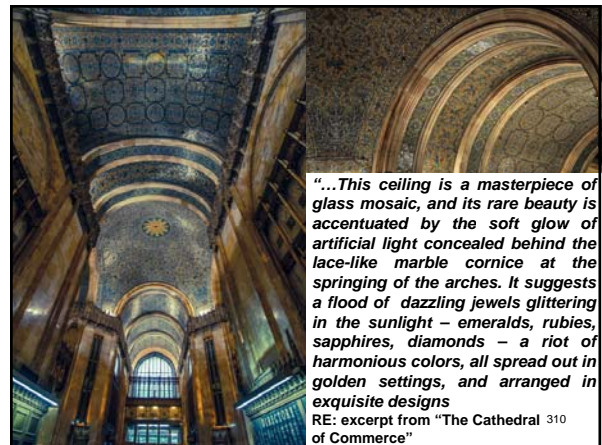
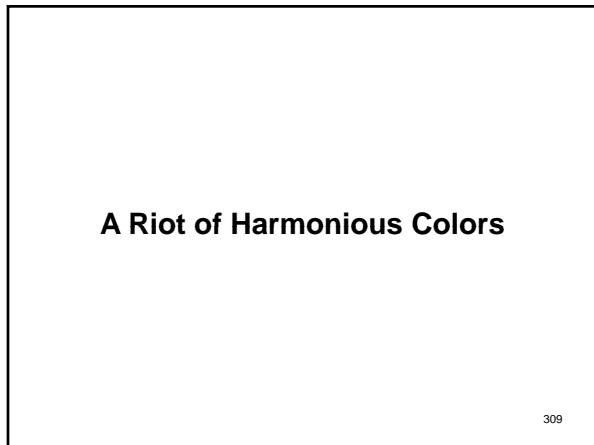
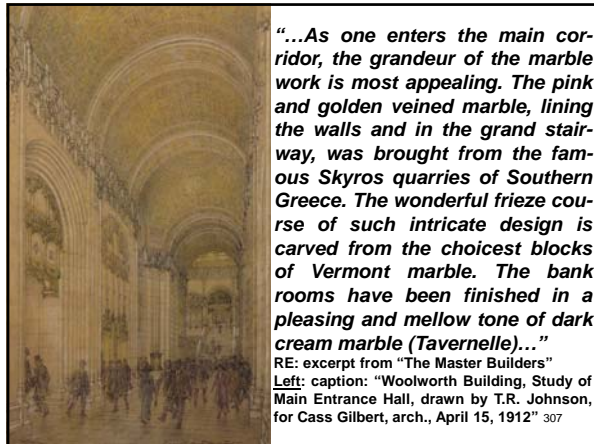
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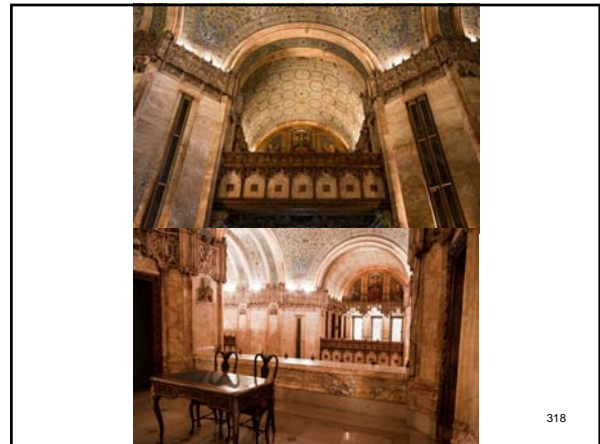
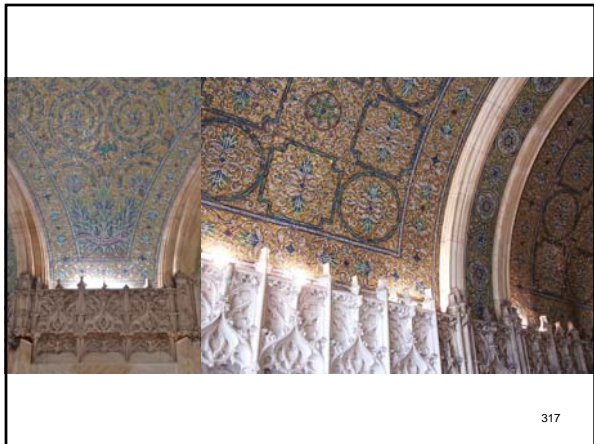
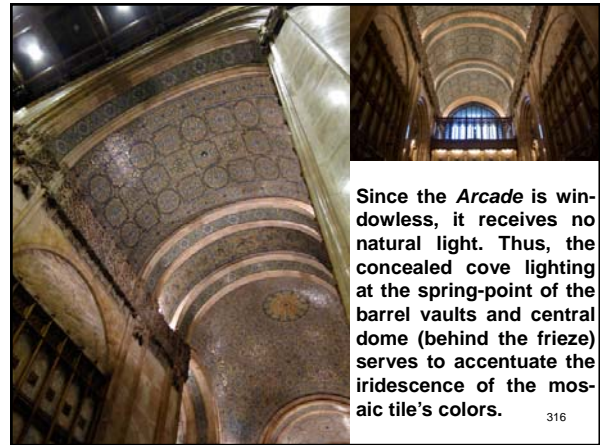
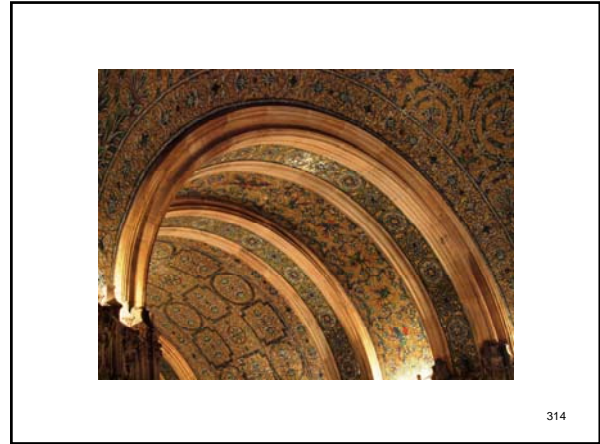
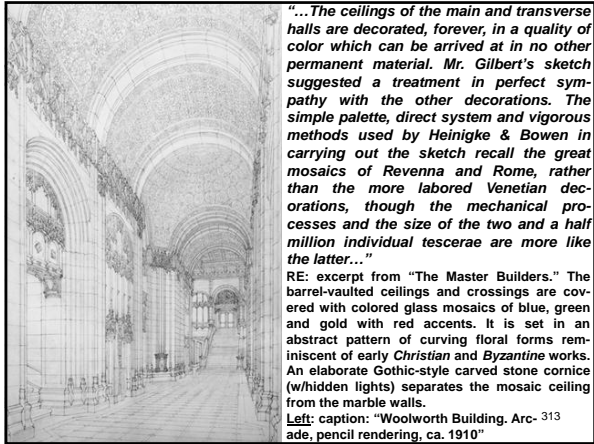


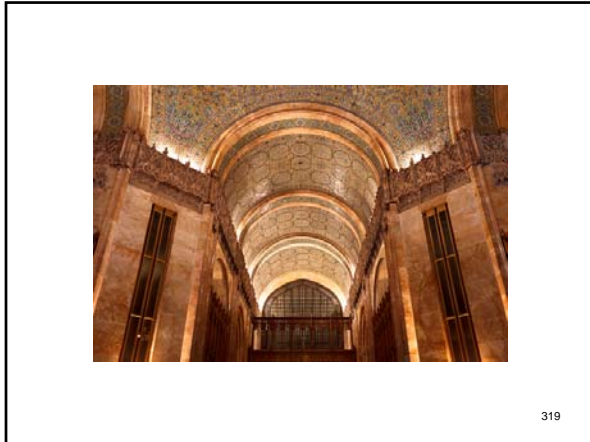
305

"...It is not absolutely necessary to visit Venice in order to view some of the most pleasing effects in mosaic glass. The ceiling of the main hall in the Woolworth Building is an entrancing mass of varying tones of light and color. The banking rooms on the floor above are even more attractive in their subdued beauty, but all material, carvings and colorings are genuinely artistic and in keeping with the general character of a structure of uncommon beauty. All the glass mosaic and leaded glass work was executed by Heinigke & Bowen and it unquestionably represents the most costly as well as the richest class of mosaic work ever contracted for in a business building..."
 RE: excerpt from "The Master Builders"

306







319



"...The whole effect is one of grandeur with which the corridor of no other building in the world may be compared; and it is, indeed, an appropriate entrance to this regal structure, 'The Cathedral of Commerce.'..."

RE: excerpt from "The Cathedral of Commerce"

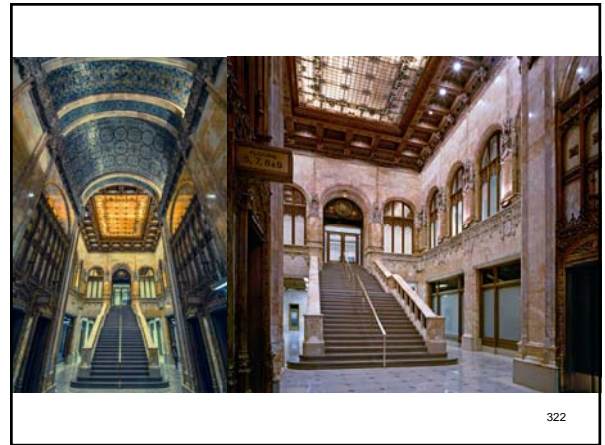
320



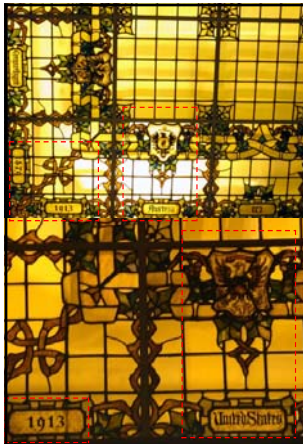
"...The leaded glass ceiling lights over the main stair and the banking room executed by the same firm, have the same sympathy with the spirit which pervades the building. That of the bank is severely conventional and merely continues the coffer paneling of the plaster, but the one over the stairs combines a quite free vine treatment with a bit of sentiment in the form of coats-of-arms of the great mercantile nations which have contributed in building both the monument and the fortune which conjured it..."

RE: excerpt from "The Master Builders"

321



322

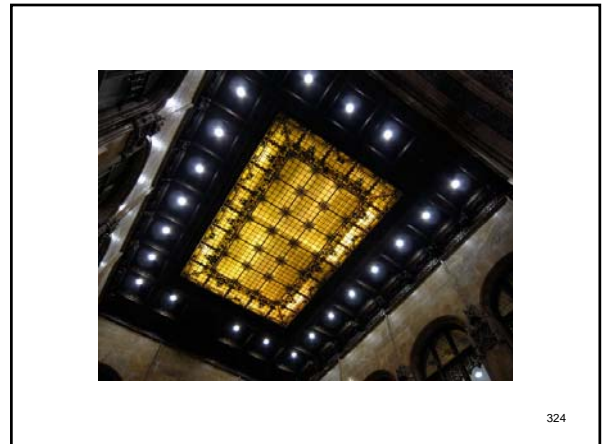


Marble Hall's ceiling is a stained-glass skylight. Surrounding its perimeter are the names of countries and their accompanying coats-of arms. Countries include:

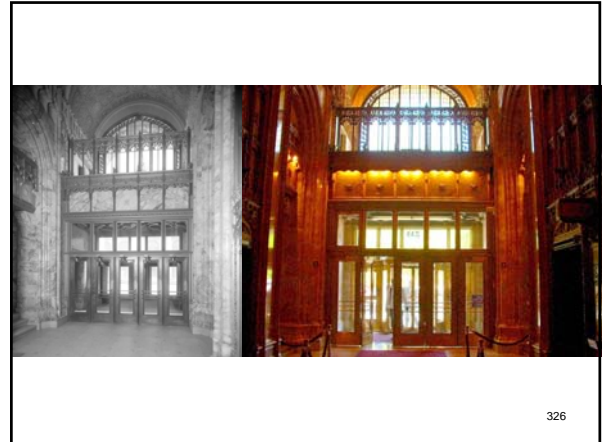
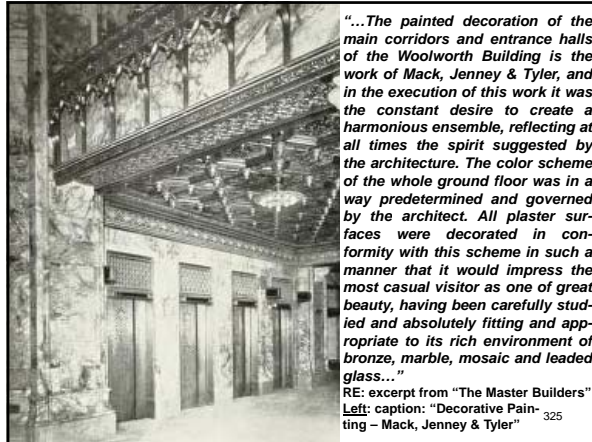
- Spain;
- China;
- Japan;
- Russia;
- Italy;
- German Empire;
- Austria (highlighted, top)
- Argentina;
- Brazil;
- France;
- United States (highlighted, bottom), and;
- Great Britain

Also included is the letter "W" (for Woolworth) and the years 1879 (founding year of the Woolworth retail empire) and 1913 (year of the Woolworth Building's completion). The skylight is set within a decorative and deeply coffered ceiling, gilded with a blue-green background and adorned at the edges with small, poly-chromed grotesque figures. Modern down-lights have been added to the surrounding coffer panels.

323

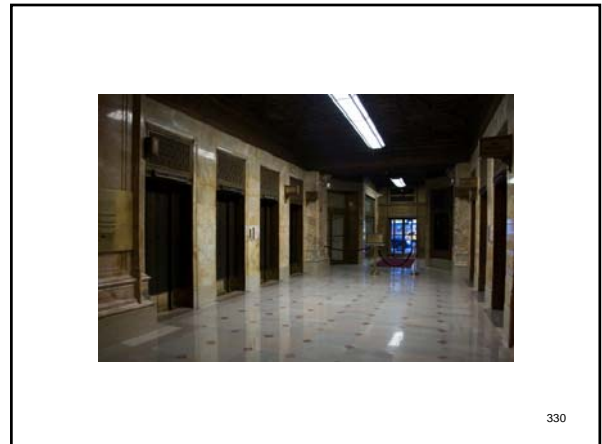


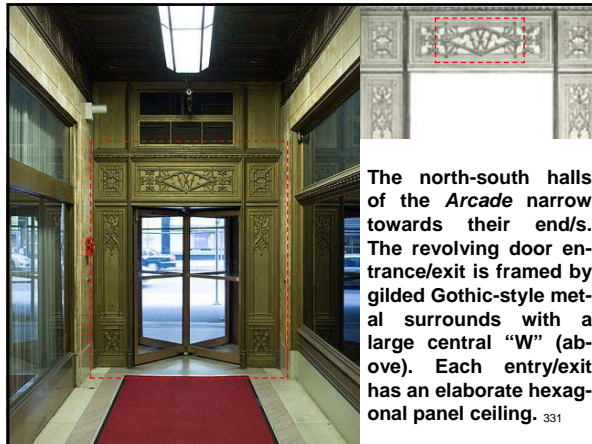
324



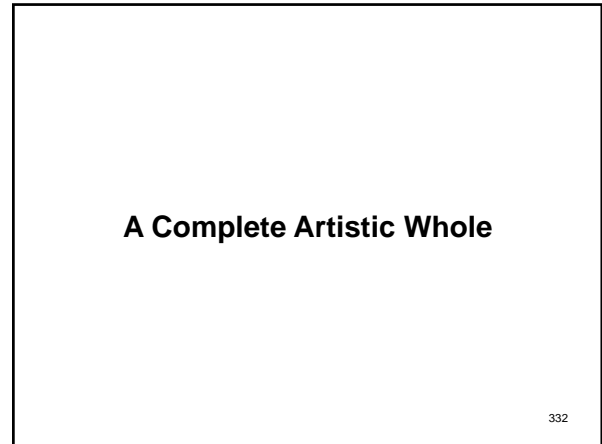
West of *Marble Hall* is located a smaller hall with marble walls and storefronts on the north and south side/s (the western wall has a central niche). Unlike the rest of the *Lobby* space, this area is only one-story high. It has a coffered ceiling; gilded with a blue-green background, but no mosaics. In the cross-beams, there are Roman portrait heads and sculpted grotesques surrounding the hall at the cornice line (they are not individual portraits as are those in the double-height Lobby areas). At the far western end of the hall/s are the north and south exit/s (*Park Place* and *Barclay Street*/s).

329



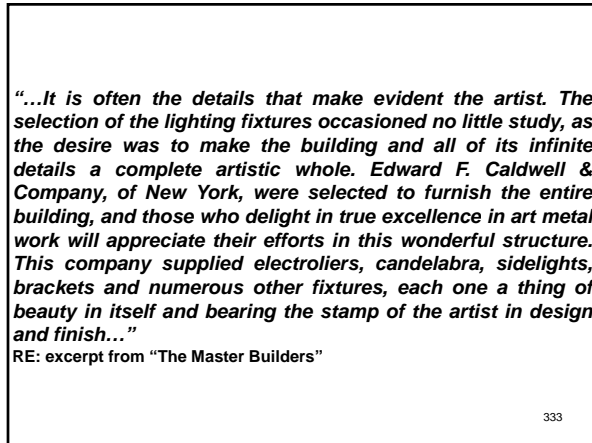


The north-south halls of the Arcade narrow towards their end/s. The revolving door entrance/exit is framed by gilded Gothic-style metal surrounds with a large central "W" (above). Each entry/exit has an elaborate hexagonal panel ceiling. 331



A Complete Artistic Whole

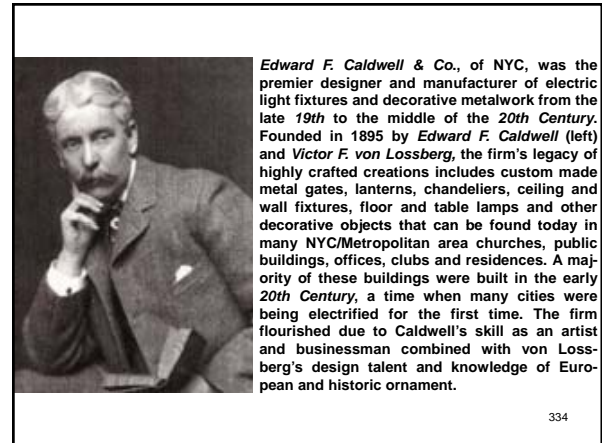
332



"...It is often the details that make evident the artist. The selection of the lighting fixtures occasioned no little study, as the desire was to make the building and all of its infinite details a complete artistic whole. Edward F. Caldwell & Company, of New York, were selected to furnish the entire building, and those who delight in true excellence in art metal work will appreciate their efforts in this wonderful structure. This company supplied electroliers, candelabra, sidelights, brackets and numerous other fixtures, each one a thing of beauty in itself and bearing the stamp of the artist in design and finish..."

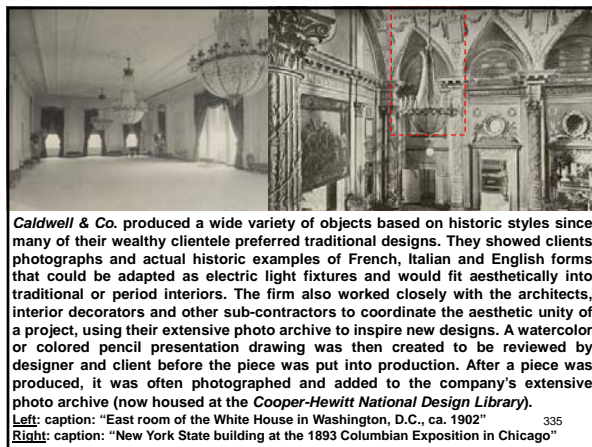
RE: excerpt from "The Master Builders"

333



Edward F. Caldwell & Co., of NYC, was the premier designer and manufacturer of electric light fixtures and decorative metalwork from the late 19th to the middle of the 20th Century. Founded in 1895 by Edward F. Caldwell (left) and Victor F. von Lossberg, the firm's legacy of highly crafted creations includes custom made metal gates, lanterns, chandeliers, ceiling and wall fixtures, floor and table lamps and other decorative objects that can be found today in many NYC/Metropolitan area churches, public buildings, offices, clubs and residences. A majority of these buildings were built in the early 20th Century, a time when many cities were being electrified for the first time. The firm flourished due to Caldwell's skill as an artist and businessman combined with von Lossberg's design talent and knowledge of European and historic ornament.

334

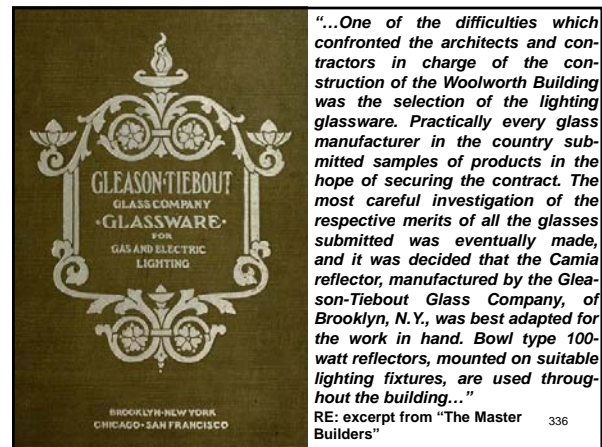


Caldwell & Co. produced a wide variety of objects based on historic styles since many of their wealthy clientele preferred traditional designs. They showed clients photographs and actual historic examples of French, Italian and English forms that could be adapted as electric light fixtures and would fit aesthetically into traditional or period interiors. The firm also worked closely with the architects, interior decorators and other sub-contractors to coordinate the aesthetic unity of a project, using their extensive photo archive to inspire new designs. A watercolor or colored pencil presentation drawing was then created to be reviewed by designer and client before the piece was put into production. After a piece was produced, it was often photographed and added to the company's extensive photo archive (now housed at the Cooper-Hewitt National Design Library).

Left: caption: "East room of the White House in Washington, D.C., ca. 1902"

Right: caption: "New York State building at the 1893 Columbian Exposition in Chicago"

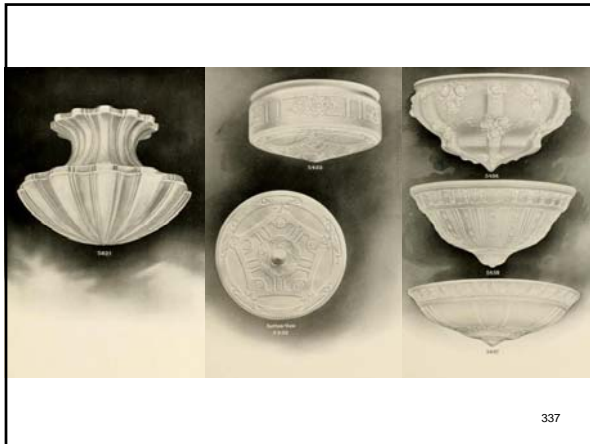
335



"...One of the difficulties which confronted the architects and contractors in charge of the construction of the Woolworth Building was the selection of the lighting glassware. Practically every glass manufacturer in the country submitted samples of products in the hope of securing the contract. The most careful investigation of the respective merits of all the glasses submitted was eventually made, and it was decided that the Camia reflector, manufactured by the Gleason-Tiebout Glass Company, of Brooklyn, N. Y., was best adapted for the work in hand. Bowl type 100-watt reflectors, mounted on suitable lighting fixtures, are used throughout the building..."

RE: excerpt from "The Master Builders"

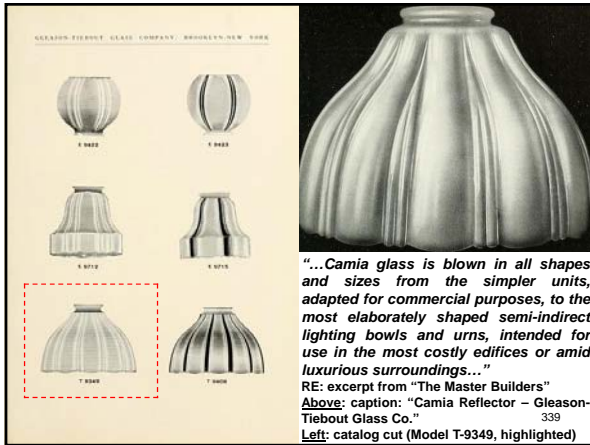
336



337

"...Camia glass is recognized as being the most beautiful white glass produced by the glass chemist. Snow-white in color, its density is sufficiently great to entirely conceal the filament of the lamp so that none of the direct rays of light strike into the eye. Used with bowl frosted lamps, glare is absolutely annulled. At the same time Camia is an economical glass to use for the reason that only about ten per cent of the light transmitted through it is absorbed. The inner surface is 'depolished,' thereby producing a perfectly diffused light, soft and comforting to the eye, even when the lighting unit is directly in the field of vision..."
 RE: excerpt from "The Master Builders"

338

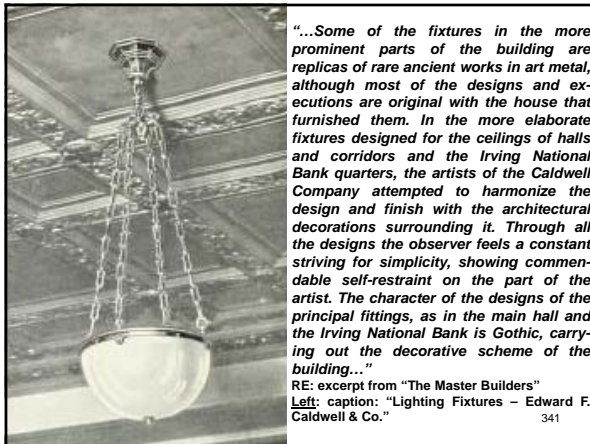


"...Camia glass is blown in all shapes and sizes from the simpler units, adapted for commercial purposes, to the most elaborately shaped semi-indirect lighting bowls and urns, intended for use in the most costly edifices or amid luxurious surroundings..."

RE: excerpt from "The Master Builders"
 Above: caption: "Camia Reflector - Gleason-Tiebout Glass Co."
 Left: catalog cut (Model T-9349, highlighted)



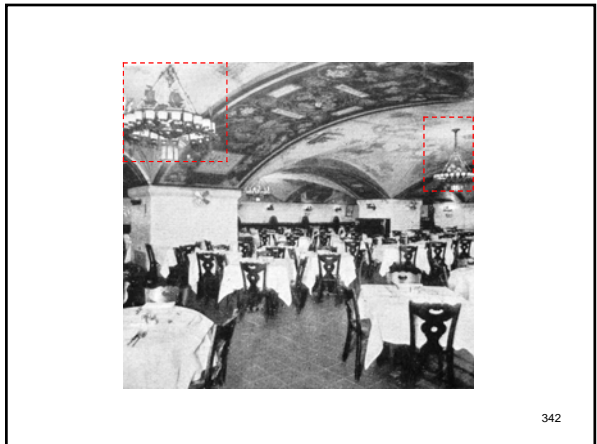
340



"...Some of the fixtures in the more prominent parts of the building are replicas of rare ancient works in art metal, although most of the designs and executions are original with the house that furnished them. In the more elaborate fixtures designed for the ceilings of halls and corridors and the Irving National Bank quarters, the artists of the Caldwell Company attempted to harmonize the design and finish with the architectural decorations surrounding it. Through all the designs the observer feels a constant striving for simplicity, showing commendable self-restraint on the part of the artist. The character of the designs of the principal fittings, as in the main hall and the Irving National Bank is Gothic, carrying out the decorative scheme of the building..."

RE: excerpt from "The Master Builders"
 Left: caption: "Lighting Fixtures - Edward F. Caldwell & Co."

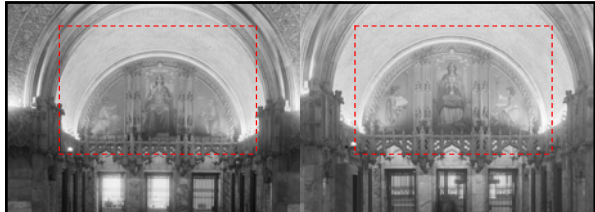
341



342

Commerce and Industry

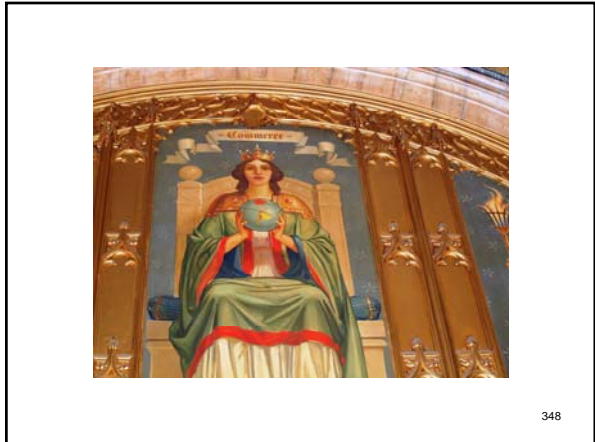
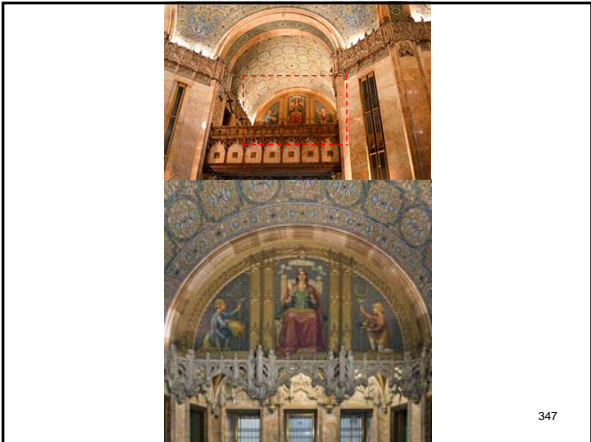
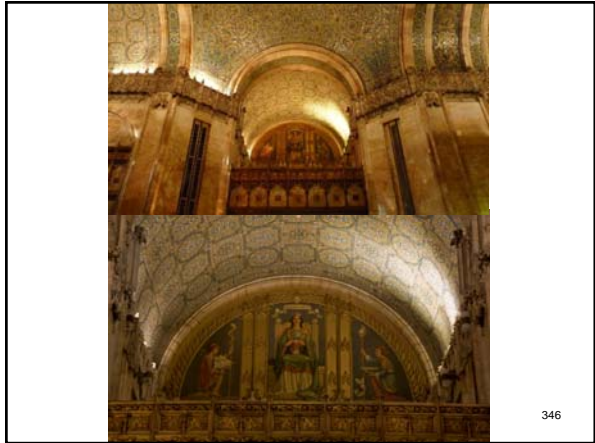
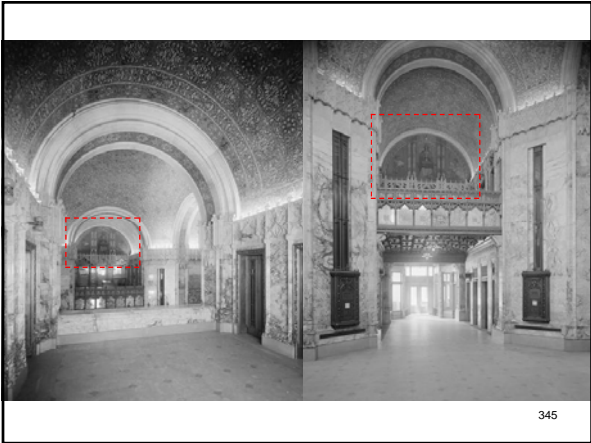
343



"...In the two lunettes of 'Commerce' and 'Industry' at either end of the large lateral corridors of the mezzanine floor the same quality of unquestioned suitability to the position they occupy was striven for. The choice of subject for the two magnified triptychs is obvious, in view of the purpose for which the building was created. In general the purpose has been to have the work in tune with its entire surroundings and thereby obtain a general harmonious effect and an attendant quality of richness, beauty and dignity, which a piece of work of this importance and character should possess..."

RE: excerpt from "The Master Builders." At the end of the *South Gallery*, over and in front of a set of doors leading to bank offices, is a painted mural in the form of a "Triptych" (three panels) representing "Commerce." A similar mural in the *North Gallery* represents "Labor."

Left: caption: "Woolworth Building. Mural painting in entrance hall. Labor." 344
Right: caption: "Woolworth Building. Mural painting in entrance hall. Commerce."



After Careful Consideration

349

"On the basis of a careful consideration of the history, the architecture, and other features of this building, the Landmarks Preservation Commission finds that the Woolworth Building, first floor interior consisting of the entrance vestibule, the entrance lobby hallway, the intersecting elevator hallways, the lobby extending from the entrance lobby hallway, and the staircase extending from the entrance lobby hallway to the mezzanine (second floor) level; mezzanine (second floor) level interior consisting of the upper part of the entrance lobby hallway and the lobby up to and including the ceiling, the elevator hallways; and the fixtures and interior components of these spaces, including but not limited to, wall and ceiling surfaces, floor surfaces, doors, elevator doors, carvings, mosaics, sculpture, murals, grilles, transom grilles, stained glass skylight, directory boards, mailboxes, wall clock, railings, and lobby shop window enframements; has a special character, special historical and aesthetic interest and value as part of the development, heritage, and cultural characteristics of New York City..."

RE: April 12th 1983 LPC findings for the Interior Landmark designation of the Lobby/Mezzanine areas of the Woolworth Building

350

Rarely Been Equaled

351

"...The Commission further finds that, among its important qualities, the Woolworth Building contains one of the finest skyscraper interiors in New York and one of the most significant nationwide; that this interior was designed by Cass Gilbert, one of the most important architects to have worked in New York and one of the most prominent architects of his era; that it is an extraordinary Gothic-style design joining an arcade with a marble staircase hall; that it is an excellent and well-executed programmatic design, illustrated with attributes of commerce, of the Woolworth Company, and of the people involved in the building's construction; that the building and its interior were created as a monument to Frank W. Woolworth and to the Woolworth '5 and 10' stores, which had become an American institution; that the design of the interior combined with special and symbolic requirements of Woolworth and of the Irving National Bank with Cass Gilbert's conception of the appropriate decoration for public spaces, which he believed should be treated as a public monument; that in size, richness and conception the interior was unprecedented in New York skyscrapers; and that as a skyscraper interior it has rarely been equaled since, in New York or elsewhere..."


RE: April 12th 1983 LPC findings for the Interior Landmark designation of the Lobby/Mezzanine areas of the Woolworth Building

352

"...The Woolworth Building, the dazzling 70-year-old "Cathedral of Commerce" whose Gothic-style spire still punctuates the lower Manhattan skyline, was granted landmark status yesterday. The City Landmarks Preservation Commission, which took the action, also designated as a landmark the building's lobby, with its barrel-vaulted mosaic ceilings, elaborate carvings, gleaming bronze filigree and polished marble...The 54-story Woolworth Building, at 233 Broadway, between Park Place and Barclay Street, is, as it was built, headquarters of the F.W. Woolworth Company. The company has carefully maintained it, although opposing landmark designation as burdensome...In New York City, it is illegal for an owner of a designated landmark to alter, reconstruct or demolish any portion of the structure without first obtaining the approval of the Landmarks Preservation Commission...The Woolworth Building was last considered by the landmarks panel in 1970. It took no vote on the matter - faced with the company's opposition and presuming that Woolworth would not alter or damage the structure. In fact, in 1977 the company began a \$22 million restoration of the building's terra cotta and limestone facade that was completed last year...For seventeen years, until it was eclipsed by the Chrysler Building, Woolworth was the tallest building in the world..."

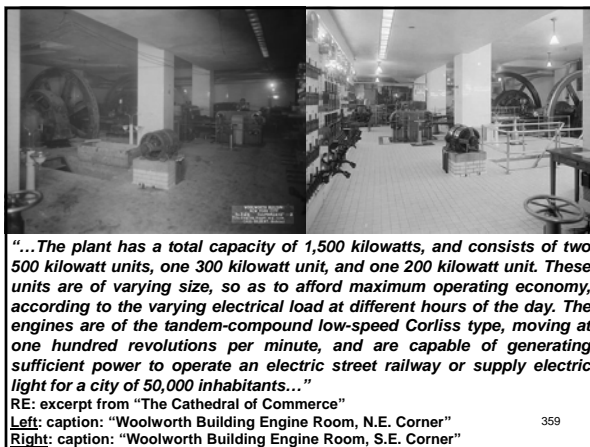
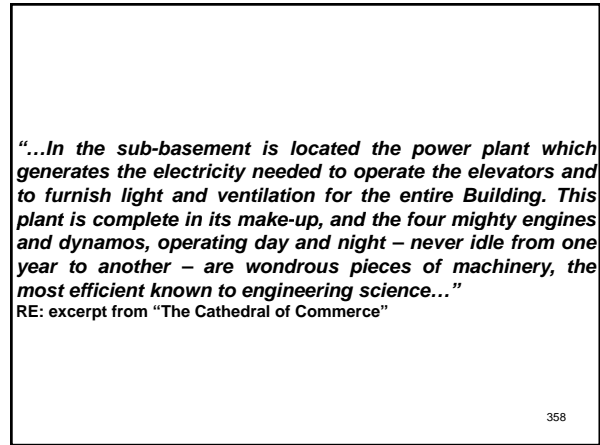
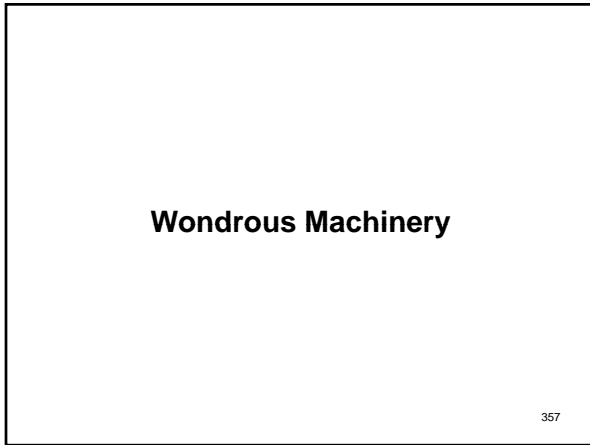
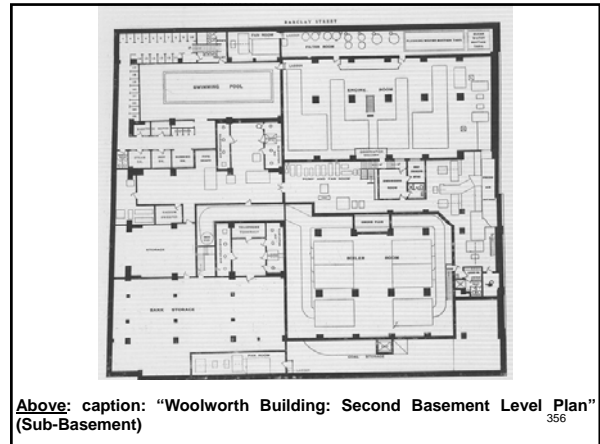
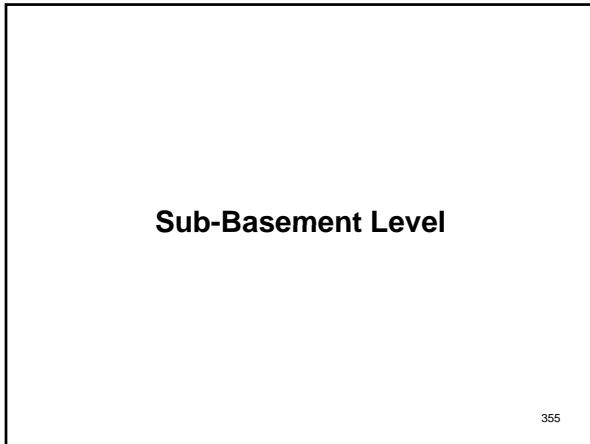
The New York Times, April 13th 1983

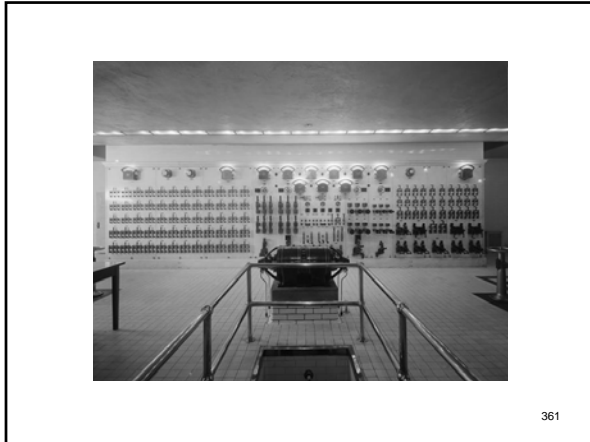
353



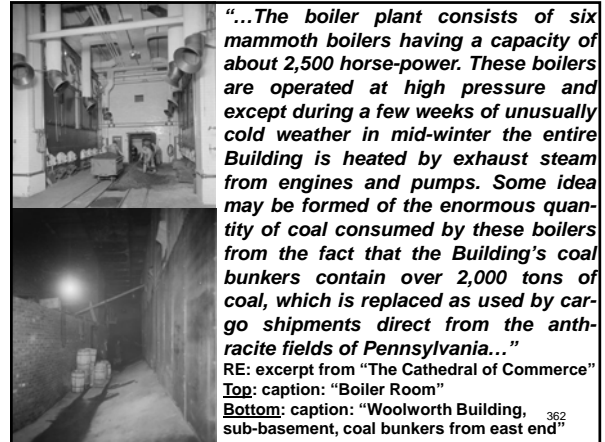
In 1977, the F.W. Woolworth Co. began a major restoration of their founder's namesake that was one of the largest restoration projects in NYC history. The project spanned several years and included the repair, cleaning and/or replacement (if necessary) of the building's terra cotta cladding. The result was impressive, to say the least, returning the base and tower to its original glistening cream color. Though no longer the highest, it remains one of the handsomest of NYC's famous skyscrapers.

354





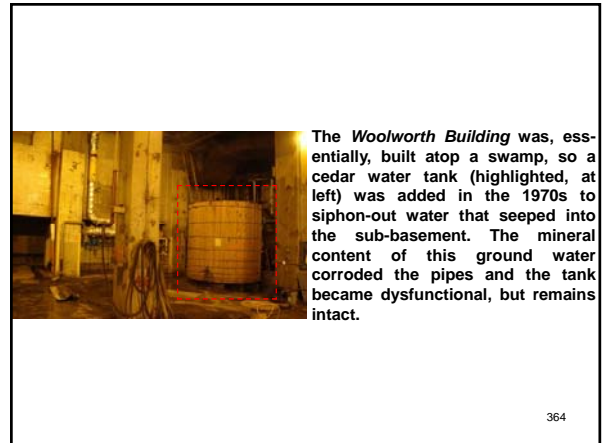
361



"...The boiler plant consists of six mammoth boilers having a capacity of about 2,500 horse-power. These boilers are operated at high pressure and except during a few weeks of unusually cold weather in mid-winter the entire Building is heated by exhaust steam from engines and pumps. Some idea may be formed of the enormous quantity of coal consumed by these boilers from the fact that the Building's coal bunkers contain over 2,000 tons of coal, which is replaced as used by cargo shipments direct from the anthracite fields of Pennsylvania..."
 RE: excerpt from "The Cathedral of Commerce"
 Top: caption: "Boiler Room"
 Bottom: caption: "Woolworth Building, sub-basement, coal bunkers from east end"
 362



"...A powerful fire-pump forms part of the Building's thoroughly complete fire-fighting equipment. This pump, located in the sub-basement, is capable of delivering 500 gallons of water per minute at the fifty-eighth story against a head pressure of 820 feet, and on account of the protection thus afforded neighboring properties, the owners have, in some cases, been able to secure substantial reductions in their fire insurance premiums..."
 RE: excerpt from "The Cathedral of Commerce"
 Left: caption: "Woolworth Building, pump room"
 Right: caption: "Woolworth Building, engine/pump room from west end"
 363



The Woolworth Building was, essentially, built atop a swamp, so a cedar water tank (highlighted, at left) was added in the 1970s to siphon-out water that seeped into the sub-basement. The mineral content of this ground water corroded the pipes and the tank became dysfunctional, but remains intact.
 364



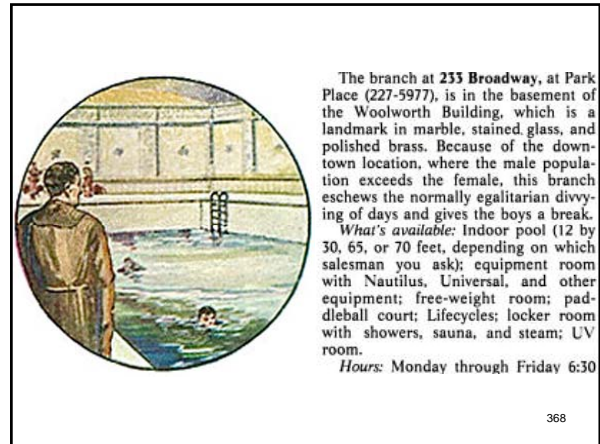
365



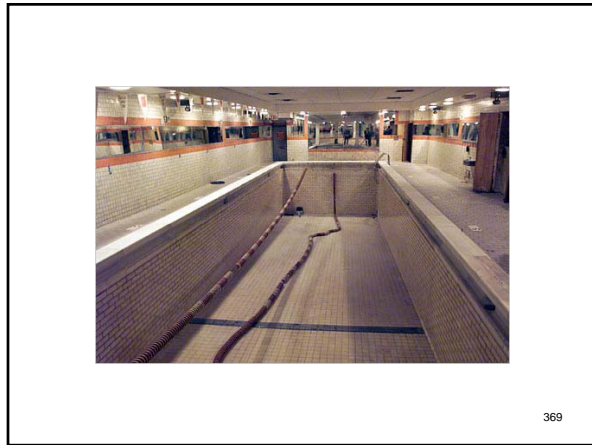
"...An immense Swimming Pool and Turkish Bath establishment, open day and night, is also located in the sub-basement, and here will be found every modern device making for comfort, safety and sanitation..."
 RE: excerpt from "The Cathedral of Commerce"
 366



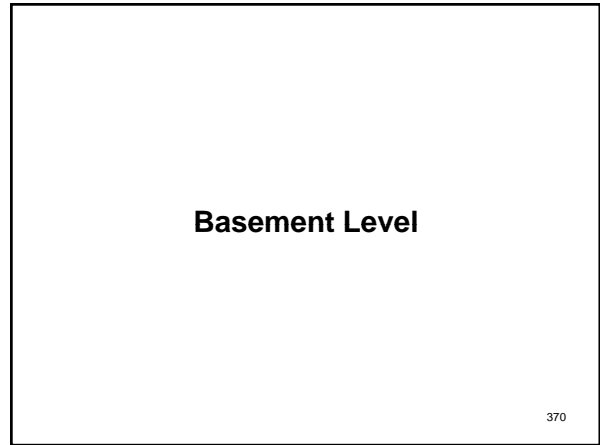
367



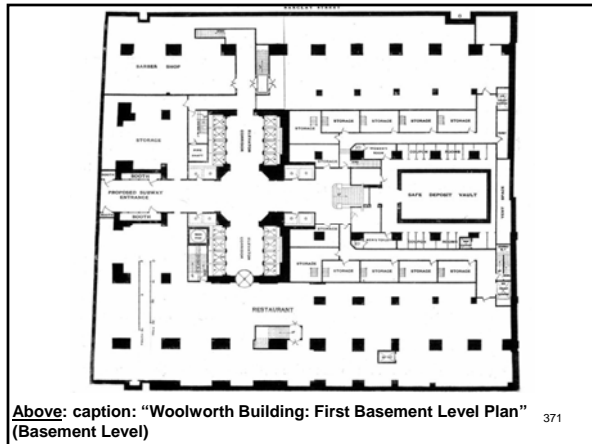
368



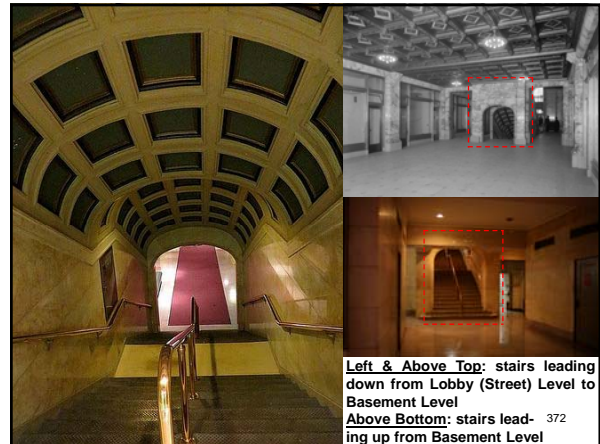
369



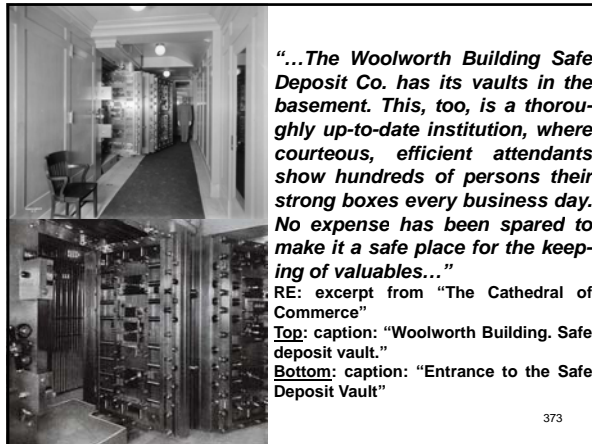
370



371



372



"...The Woolworth Building Safe Deposit Co. has its vaults in the basement. This, too, is a thoroughly up-to-date institution, where courteous, efficient attendants show hundreds of persons their strong boxes every business day. No expense has been spared to make it a safe place for the keeping of valuables..."

RE: excerpt from "The Cathedral of Commerce"

Top: caption: "Woolworth Building. Safe deposit vault."

Bottom: caption: "Entrance to the Safe Deposit Vault"

373



Top Left: caption: "Woolworth Building, vault (03/10/1913)"

Top Right: caption: "Woolworth Building, vault from N.E. corner (04/08/1913)"

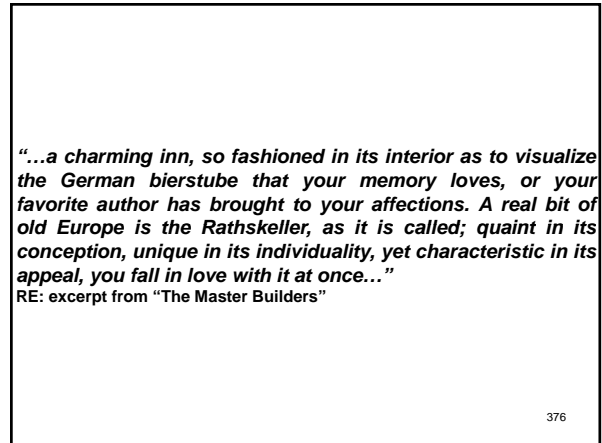
Left: caption: "Woolworth Building. Safe deposit vaults (ca. 1915)"

374



A Bit of Old Europe

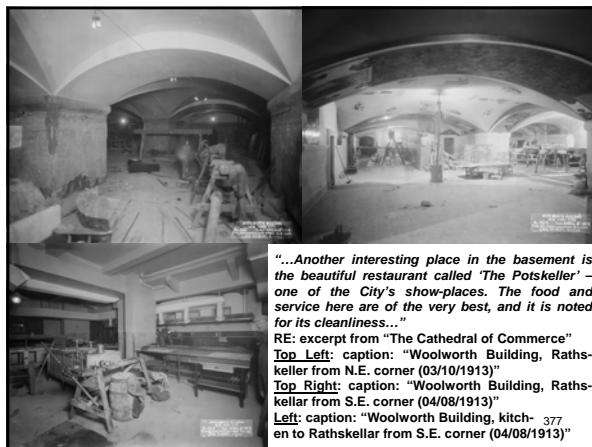
375



"...a charming inn, so fashioned in its interior as to visualize the German bierstube that your memory loves, or your favorite author has brought to your affections. A real bit of old Europe is the Rathskeller, as it is called; quaint in its conception, unique in its individuality, yet characteristic in its appeal, you fall in love with it at once..."

RE: excerpt from "The Master Builders"

376



"...Another interesting place in the basement is the beautiful restaurant called 'The Potskeller' - one of the City's show-places. The food and service here are of the very best, and it is noted for its cleanliness..."

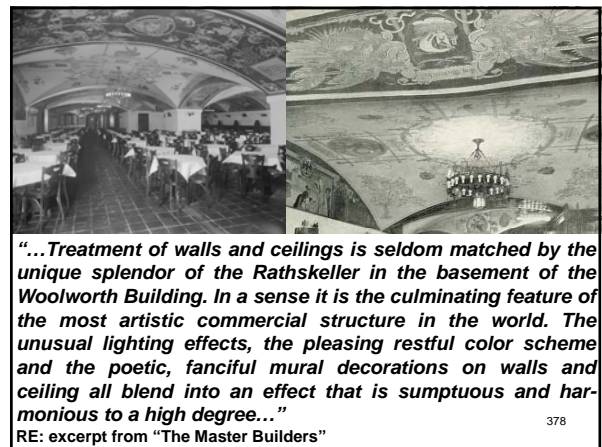
RE: excerpt from "The Cathedral of Commerce"

Top Left: caption: "Woolworth Building, Rathskeller from N.E. corner (03/10/1913)"

Top Right: caption: "Woolworth Building, Rathskeller from S.E. corner (04/08/1913)"

Left: caption: "Woolworth Building, kitchen to Rathskeller from S.E. corner (04/08/1913)"

377



"...Treatment of walls and ceilings is seldom matched by the unique splendor of the Rathskeller in the basement of the Woolworth Building. In a sense it is the culminating feature of the most artistic commercial structure in the world. The unusual lighting effects, the pleasing restful color scheme and the poetic, fanciful mural decorations on walls and ceiling all blend into an effect that is sumptuous and harmonious to a high degree..."

RE: excerpt from "The Master Builders"

378



"...The color scheme of the Rathskeller is a blending of cream white, warm red and gold. The walls are white and great pillars of white rise toward the low-sloping, arched ceiling to merge with the brilliantly colored scenes depicted there. The mural decorations give the immense dining-room its tone and atmosphere. Mr. Frederick J. Wiley, the mural painter, designed and executed the Rathskeller's entire mural decorations..."

RE: excerpt from "The Master Builders"

379



"...The spirit that prevails is Fifteenth Century, although many of the scenes and some of the musicians, writers and poets pictured are distinctly modern. The frieze on the walls shows individual figures of celebrities in characteristic attitudes and ensemble groups with just a touch of the grotesque to make them seem really human and interesting...Medieval hunting scenes, towering castles, wandering troubadours, knightly horsemen, wind-driven galleons - all are pictured in a free, joyous spirit, poetic in conception, rich in color and design...Artists and laymen who have seen the Woolworth's Rathskeller pronounce it the most unique and artistic in the country..."

RE: excerpt from "The Master Builders"

380

The Dear Old Yesterdays

381

"...And the chimes! The deep-toned tubes of bell metal brass, animated by the god of modern science, heighten the illusion of the Fatherland in good old German songs that link the American today with the dear old yesterdays of a youth long past...In truth, you have not seen the wonders of the Woolworth Building until you have visited the Rathskeller with its set of Yerkes Self-Playing chimes..."

RE: excerpt from "The Master Builders"

382



"...The chimes represent the last word in a field where music and science are true allies. They consist of eighteen tubes, mounted on stationary track especially constructed to fit the furnishing scheme of the establishment and equipped with single stroke magnets. They are played automatically by means of a pneumatic player devised by Henry A. Yerkes, of the Yerkes Sound-Effects Company, who manufacture the Yerkes Temple Bells and Westminster Chimes. This pneumatic player is fitted with a clockwork attachment which acts as a kapellmeister to the brass choir, starting a number on schedule time at the striking of the hour...The Yerkes Sound-Effects Company has its own factory building at 202 East Eighty-eighth Street, New York City, where it turns out its product for the wide world to enjoy, from Broadway to Melbourne, and from the Yukon to Mandalay..."

RE: excerpt from "The Master Builders"
Left: caption: "Chimes in Rathskeller"

383



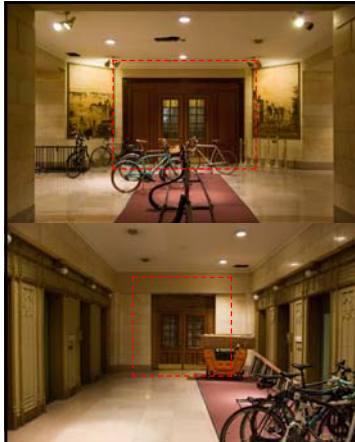
"...There is also a large, finely equipped Barber Shop in the basement where the appointments are unexcelled and the service first class in every particular..."

RE: excerpt from "The Cathedral of Commerce"

Top Left: caption: "233 Broadway - Barclay Street (Meyers Cafe interior - Woolworth Building)"

Top Right: caption: "View Towards Bar" 384

Left: caption: "Barber Shop"



Top: doors to a defunct passageway under *Broadway* which led to the BMT and IRT subway/
Bottom: these nearby doors once led to a passageway under *Park Place* to the Nos. 2/3 subway station

385

For the Convenience of Customers

386



"...Through the resplendent corridor with its rich ceiling – up the grand marble staircase, one enters the spacious quarters of The Irving National Bank. One immediately feels impressed by the imposing character of this room, with its dominant notes expressed in the rich and luminous yet subdued coloring of the ceiling. The influence of Fifteenth Century Gothic is strongly and agreeably felt throughout the interior. The beautifully embellished coffered ceiling is executed in tones of old gold, warm greys and deep blues that strike the keynote of the complete color scheme and enhance the harmony of the entire room. A most successful result has been produced here, which not only beautifies the room but reflects the prevailing character of the building..."

RE: excerpt from "The Master Builders"
Top: caption: "Woolworth Building. Entrance hall toward Irving National Bank."
Bottom: caption: "Woolworth Building. Detail of corner windows in hall. Irving National Bank."

387

"I showed him (Woolworth) one plan indicating the stairs of the bank on each side of the arcade rising from the east to the west and we discussed the fact that it would shut off the rear of three of the stores which seemed to him undesirable. We also discussed placing the stairs to the bank east of the east tier of elevators, that is to say, between the elevators and the Broadway front, but the space was not sufficient without considerable modification of the column plan and he approved the plan which showed the stairs to the Bank rising at right angles with the arcade just back of the tower...Mr. Pierson took the telephone then and told me most emphatically and forcibly that the stairs as suggested by me and approved by Mr. Woolworth would not be satisfactory."

Cass Gilbert, Architect
 RE: excerpt from his notes (ca. January 1911)

388



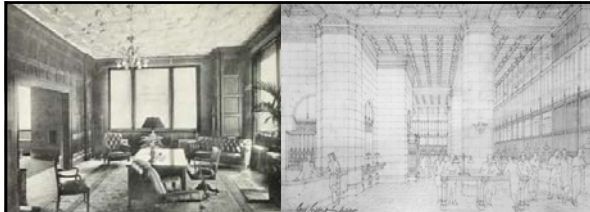
The Irving National Bank's formal entrance was known as "Marble Hall." It was Gilbert's intention to focus this area on a formal staircase rising to the mezzanine level. However, how exactly this staircase would interface with the stores below and the Arcade, in general, was problematic. Irving Bank president *Lewis Pierson* was very displeased with Gilbert's scheme which FW had signed-off on. Ultimately, the plan executed was not approved by all parties until a year later (January 1912). With its rectangular space, flat ceiling and centrally located staircase, Marble Hall's overall design theme is suggestive of a *Medieval Guild Hall*.

Left: caption: "The Staircase Leasing to the Irving National Bank from the Main Floor"

389



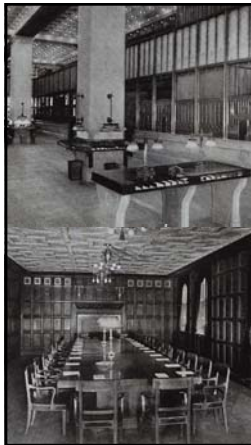
390



"...In many respects the Irving National Bank is responsible for the existence of the Woolworth Building. It was in reality the problem of finding a suitable home for the bank that gave Mr. Woolworth the idea of a building, part of which would be occupied by the Irving National Bank. The Irving National Bank was organized in 1851, and was known originally as the New York Exchange Bank...After having faithfully studied the problem of providing adequate quarters for the increasing business of the bank, the Board of Directors finally accepted an offer from Mr. F.W. Woolworth, which provided for rental by the bank of ample space in the mammoth fifty-seven story Woolworth Building, which was then in course of construction..."
 RE: excerpt from "The Master Builders"
 Left: caption: "President's Room - Irving National Bank"
 Right: caption: "Irving Nat'l. Bank, interior, Woolworth Bldg. Pencil rendering, ca. 1912"

"...take out the additional stock necessary to make the consolidation of the two banks a success if the bank would move up to Broadway and take quarters."
 F.W. Woolworth
 RE: in 1910, Lewis Pierson, president of the Irving National Exchange Bank (and a personal friend of FW) was trying to engineer a merger between the Irving National and the Mercantile National Bank. By then, FW was in an advanced state of planning for his new corporate headquarters and saw in this merger an opportunity to acquire a pecuniary partner in the enterprise. FW proposed to invest in the bank consolidation if they would occupy prime space in his new skyscraper. The two banks agreed and, in May 1912, the Irving National Exchange and Mercantile National bank/s were merged under the name "Irving National Bank."

392



"...The Irving National Bank and the Broadway Trust Company, nationally known institutions, occupy spacious quarters on one of the main floors, and provide every modern banking facility for the convenience of customers. In the Irving National Bank each department is as convenient to the customer as the single window in the smallest country bank. The final humanizing touch has been given to the Tellers' Department: Each teller both pays and receives, so that customers always transact business with the same teller whether depositing or withdrawing funds. Personal contact between the customers and officers is encouraged by the special design of the Bank's quarters; all officers are within easy reach..."
 RE: excerpt from "The Cathedral of Commerce"
 Top: caption: "Irving National Bank - Main Lobby"
 Bottom: caption: "Irving National Bank - Director's Room"
 393



Left: Lewis E. Pierson, president of Irving National Exchange Bank, operates a ticker tape machine (in terra cotta corbel caricature) in the building's Lobby), suggestive of the profits derived from the bank's joint stock ownership in the Broadway-Park Place Company - the corporation established by Pierson and FW to finance the Woolworth Building's construction as well as to manage it as a rental property. FW's relationship with the bank began as a depositor and, subsequently, the bank financed the expansion of his chain of stores.
 394



"...The Broadway Trust Company conducts its business along similar lines, personal service being dominant in both institutions..."
 RE: excerpt from "The Cathedral of Commerce." FW had intended to build a modest bank and office building for his company and his co-sponsor; the Irving National Bank, but as the project progressed, it had become the tallest building in the world. Soon after completion, FW bought out Irving National Bank's interest in the building, reducing the bank's status to that of tenant.
 Left: caption: "Entrance staircase to the Broadway Trust Company"
 395

In Thorough Harmony

396

"...The admirable vault equipment and the steel filing cases and steel omnibuses used by the Irving National Bank and Broadway Trust Company located in the Woolworth Building, were manufactured by the famous Canton Art Metal Company, of Canton, Ohio..."

RE: excerpt from "The Master Builders"

397



"...In modern banks and offices steel furniture and filing devices have become an absolute necessity. Steel is adaptable to the various forms and size most useful in office appliances, and when well designed, made and artistically finished, they are immeasurably useful as well as highly ornamental. The fire-resisting qualities and economy generally are also worthy of careful consideration...Steel furniture never wears out and vermin cannot lodge or germinate in it. Insects cannot feed upon it as they do upon wood. Steel furnishing, in fact, meets the demands of modern life, and is in thorough harmony with modern progress..."

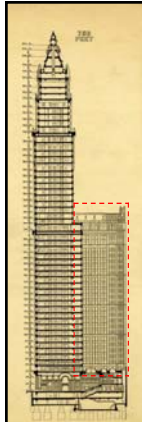
RE: excerpt from "The Master Builders"

398

Above: caption: "Steel Office Furniture – Canton Art Metal Co."

Not So

399

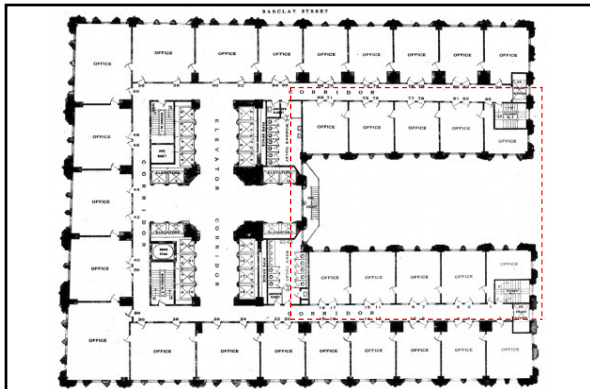


"...In most buildings the inside court offices are usually quite dark and undesirable on account of the narrowness of the openings and the height and dingy character of their walls. Not so in the Woolworth Building. It has a great, wide court – nearly the width of an average city street, and, as the walls are of glazed white tile, much natural light is reflected into the court offices, making them practically as choice as those facing the streets. All offices in the entire Building, without exception, are especially wide, light, and well ventilated, and their appointments are of the very best..."

RE: excerpt from "The Cathedral of Commerce"

Left: east-west longitudinal section looking south - court area windows (on south wing) in elevation (highlighted)

400



Above: caption: "Typical Office Floor Plan" (Light Court offices highlighted)⁴⁰¹



402



"It is very difficult to make a business building picturesque...the architect has to utilize all of the space on the lot, therefore there can be no projections giving light and shade and no important recesses giving that effect of depth and mass so impressive in any of the old buildings of Europe...many windows so divided that all the offices should be well lighted and so that partitions might be placed at almost any location, sub-dividing the spaces into larger or smaller offices as tenants might require. Such a requirement naturally prevented any broad wall space..."

Cass Gilbert, Architect

RE: Gilbert's Beaux-Arts education and experience in designing highly ornate public buildings – several of which were in NYC, made him the ideal choice for the Woolworth Building commission.

403

"By its combination of Italian, French and Renaissance architecture with Gothic steeple, in creamy white stone and terra cotta, the result is a building unique and one of the most beautiful in the world...The structure contains over 17,000,000 bricks, 24,000 tons of steel girders, 29 elevators, 13,200,000 cubic feet of space...200 feet higher than the Great Pyramid...fireproof and smoke-proof stairs...enough to climb a mountain 4,000 feet high...87 miles of electrical wiring...lamps that would light forty miles of waterfront around Manhattan...six 2,500 horsepower boilers that could lift 100 Statues of Liberty. It weighs 206,000,000 pounds at the caissons...and can withstand wind speeds of 125 miles an hour...elevator shafts total two miles...there are 48 miles of plumbing, 53,000 pounds of bronze and iron hardware, 3,000 hollow steel doors, 12 miles of marble trim, 12 miles of slate base, 383,325 pounds of red lead, 50,000 cubic yards of sand, 15,000 yards of broken stone, 7,500 tons of terra cotta, 28,000 tons of hollow tile...and no wood. And enough glass to cover Union Square."

The Wall Street Journal, April 26th 1913

404



"...The Woolworth tower is 86 feet by 84 feet, and 55 stories high. The main building, whose roof is 385 feet above the street level, is 29 stories in height and includes about 30,200,000 cubical feet. The building contains 27 acres of rentable office space, and about 13 acres more are taken up with elevators and corridors...There are over 3,000 exterior windows in the building...In the furnishing of the building, over 443 miles of plumbing pipes were used, 53,000 pounds of bronze and iron hardware, 3,000 hollow steel doors, 12 miles of marble trim, 12 miles of slate base, 383,325 pounds of red lead, 20,000 cubic yards of sand, and 25,000 cubic yards of broken stone, 7,500 tons of exterior architectural terra cotta – the most complicated architectural terra cotta in the world..."

RE: excerpt from "Above the Clouds and Old New York"

405

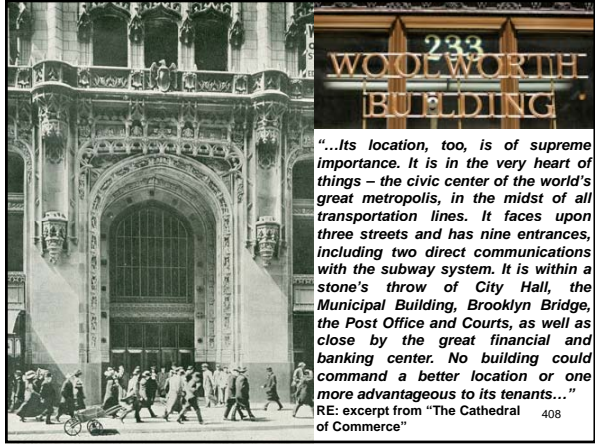
Part 5

An Advantageous Location

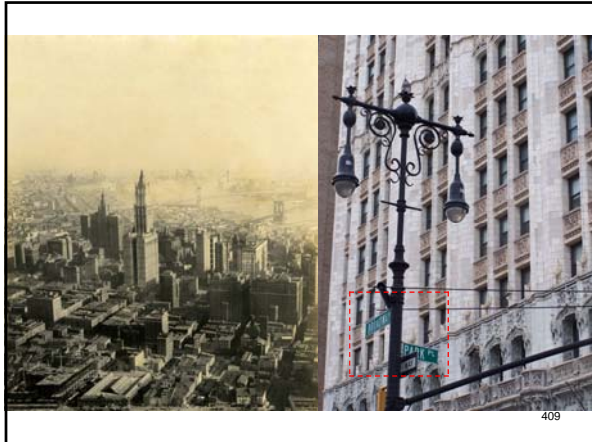
406

Within a Stone's Throw

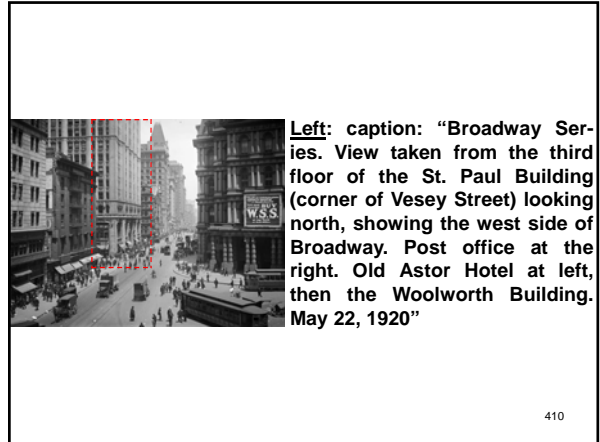
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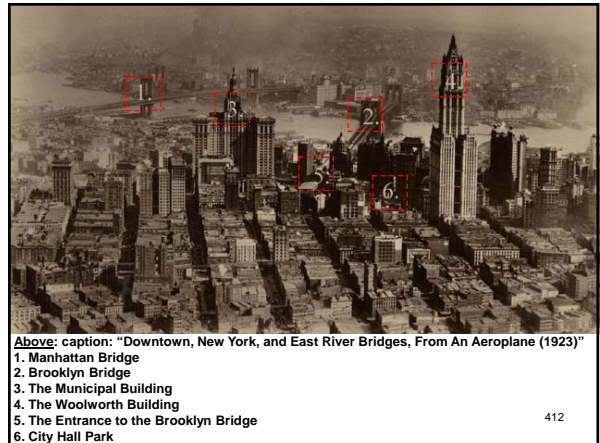


Left: caption: "Broadway Series. View taken from the third floor of the St. Paul Building (corner of Vesey Street) looking north, showing the west side of Broadway. Post office at the right. Old Astor Hotel at left, then the Woolworth Building. May 22, 1920"

410



411

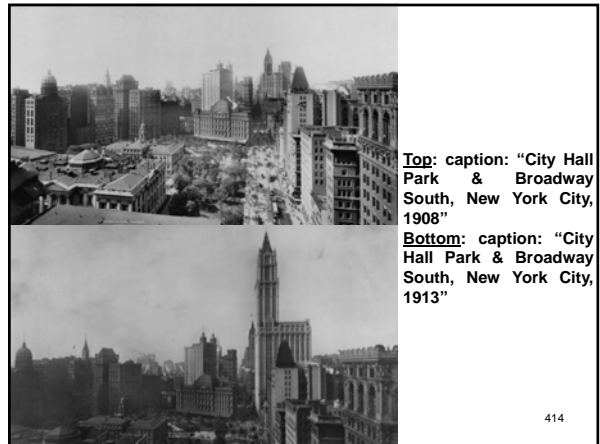


Above: caption: "Downtown, New York, and East River Bridges, From An Aeroplane (1923)"
 1. Manhattan Bridge
 2. Brooklyn Bridge
 3. The Municipal Building
 4. The Woolworth Building
 5. The Entrance to the Brooklyn Bridge
 6. City Hall Park

412

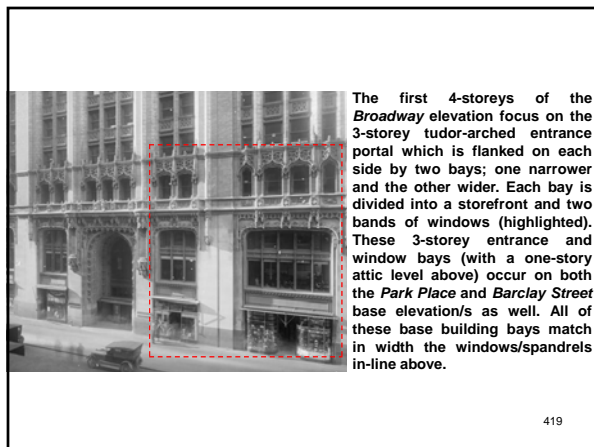
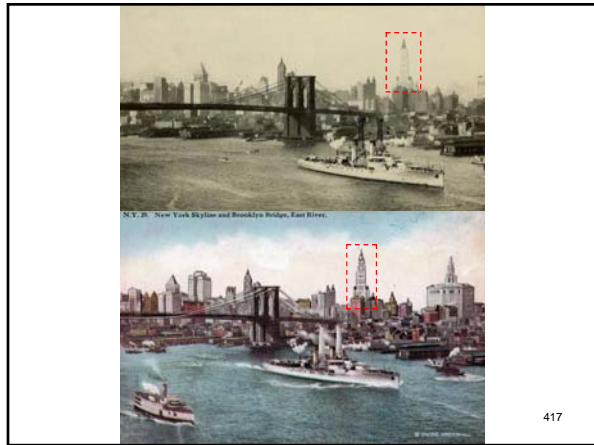


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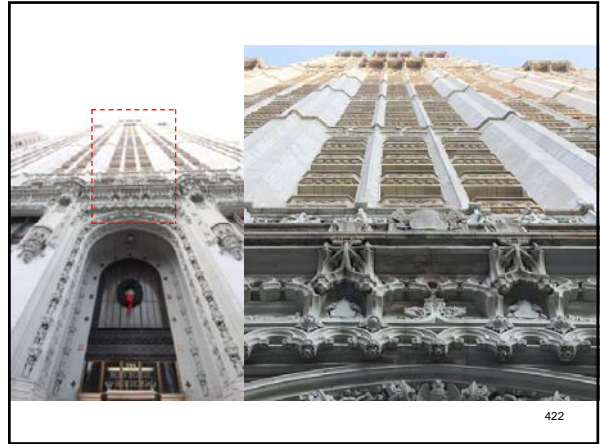
Top: caption: "City Hall Park & Broadway South, New York City, 1908"
Bottom: caption: "City Hall Park & Broadway South, New York City, 1913"

414





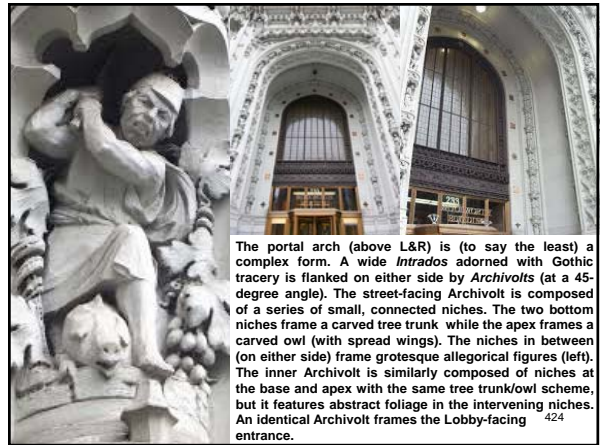
An elaborately carved stone balcony and related ornamental projections, in collaboration with the arch and bays, form a triumphal arch. The motif of the stone carvings are Gothic-inspired. The balcony includes narrow panels with shields separating wide panels of Gothic tracery over the entrance and wide panels with stylized flowers over the flanking bays. The center panel supports a large eagle holding a shield at its breast. From either side of the entrance arch, an elaborately carved niche with Gothic tracery descends, culminating with a carved coiled serpent at its base. Similar deep relief Gothic tracery (with fanciful grotesques) link the balcony with the arches of the entry and its flanking bays. A depressed arch outlined with a course of trefoil tracery frames the tudor-arch entrance. 421



422



423



The portal arch (above L&R) is (to say the least) a complex form. A wide *Intrados* adorned with Gothic tracery is flanked on either side by *Archivolts* (at a 45-degree angle). The street-facing Archivolt is composed of a series of small, connected niches. The two bottom niches frame a carved tree trunk while the apex frames a carved owl (with spread wings). The niches in between (on either side) frame grotesque allegorical figures (left). The inner Archivolt is similarly composed of niches at the base and apex with the same tree trunk/owl scheme, but it features abstract foliage in the intervening niches. An identical Archivolt frames the Lobby-facing entrance. 424



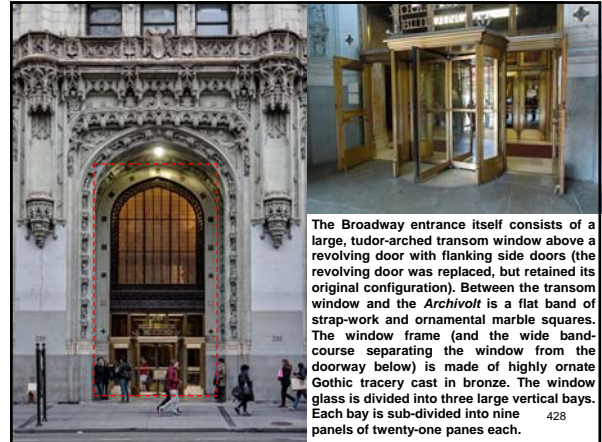
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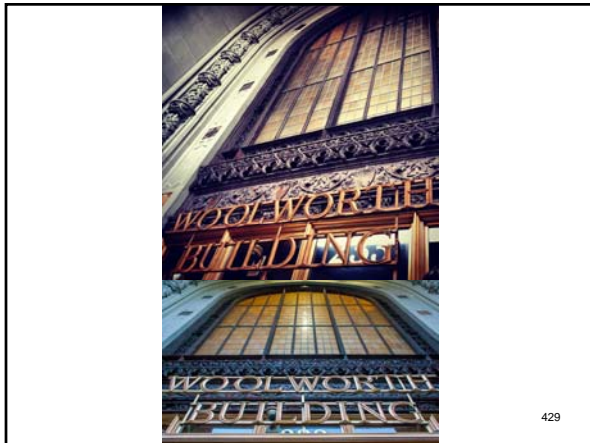


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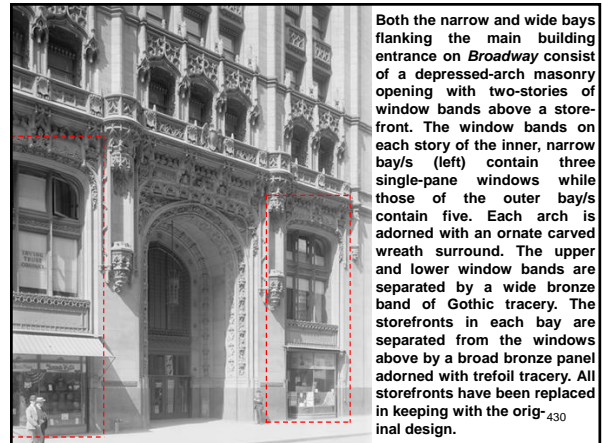


The Broadway entrance itself consists of a large, tudor-arched transom window above a revolving door with flanking side doors (the revolving door was replaced, but retained its original configuration). Between the transom window and the *Archivolt* is a flat band of strap-work and ornamental marble squares. The window frame (and the wide band-course separating the window from the doorway below) is made of highly ornate Gothic tracery cast in bronze. The window glass is divided into three large vertical bays. Each bay is sub-divided into nine panels of twenty-one panes each.

428

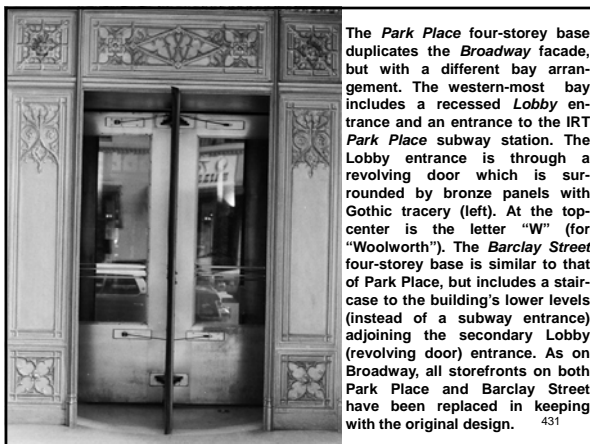


429



Both the narrow and wide bays flanking the main building entrance on *Broadway* consist of a depressed-arch masonry opening with two-stories of window bands above a storefront. The window bands on each story of the inner, narrow bay/s (left) contain three single-pane windows while those of the outer bay/s contain five. Each arch is adorned with an ornate carved wreath surround. The upper and lower window bands are separated by a wide bronze band of Gothic tracery. The storefronts in each bay are separated from the windows above by a broad bronze panel adorned with trefoil tracery. All storefronts have been replaced in keeping with the original design.

430



The *Park Place* four-storey base duplicates the *Broadway* facade, but with a different bay arrangement. The western-most bay includes a recessed *Lobby* entrance and an entrance to the IRT *Park Place* subway station. The *Lobby* entrance is through a revolving door which is surrounded by bronze panels with Gothic tracery (left). At the top-center is the letter "W" (for "Woolworth"). The *Barclay Street* four-storey base is similar to that of *Park Place*, but includes a staircase to the building's lower levels (instead of a subway entrance) adjoining the secondary *Lobby* (revolving door) entrance. As on *Broadway*, all storefronts on both *Park Place* and *Barclay Street* have been replaced in keeping with the original design.

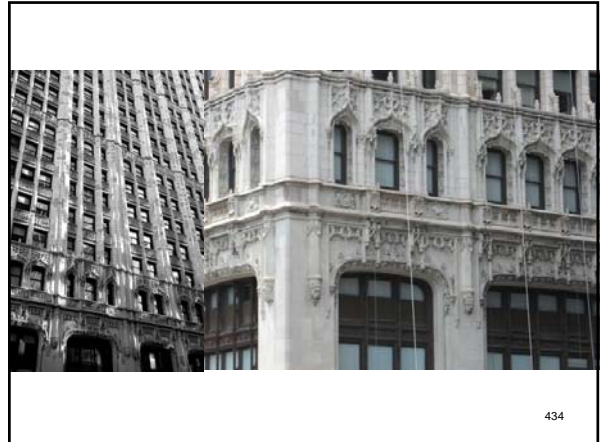
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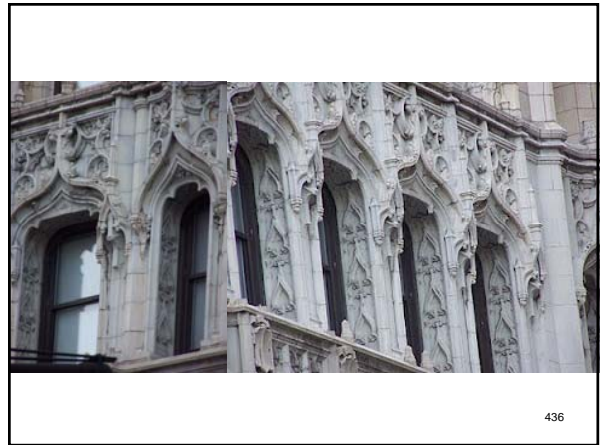


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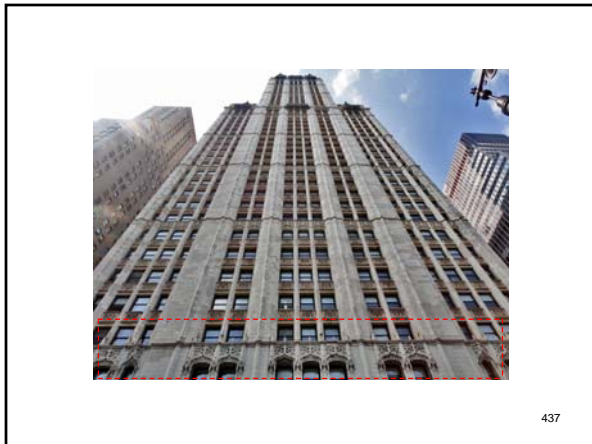


The *Fourth Floor "Attic"* level of the base includes the first group of office windows. Each window is set within an "Ogee" arch topped with Gothic tracery. Each window is separated from adjoining windows by a carved niche. As well, the *Intrados* of each arch is adorned with Gothic tracery. A string course delineates the four-storey limestone base from the architectural terra cotta portion above.

435



436



437



Six angled piers are carried down into the base. Two end in the carved niches flanking the *Broadway* entrance while the other four end in corbels carved in stone as allegorical human faces. From south-to-north, the faces represent the four continents of *Africa, America, Europe* and *Asia*.

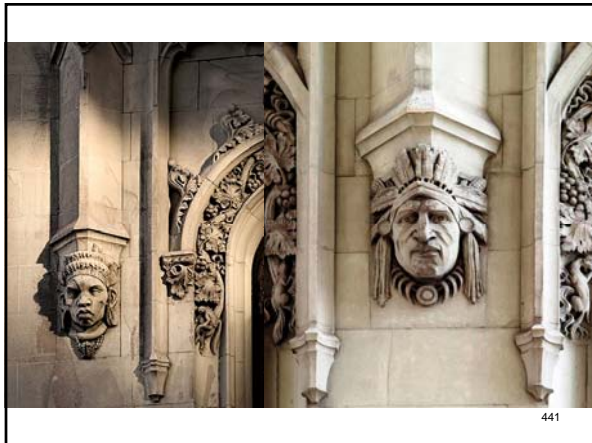
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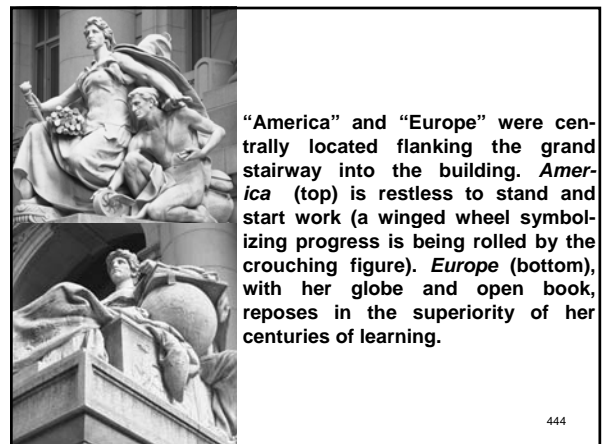
441



442



Hailed by *The New York Times* as “a great Temple of Commerce,” Cass Gilbert’s allusions to the classical model were readily apparent in his design for the *U.S. Customs House* at the southern tip of *Manhattan* island. However, it was in the sculptural program (representing the great seafaring nations of world history and four of the seven continents) where this classicism found a modern expression. For the twelve nations perched along the attic story (beginning with *Greece* and *Rome* and ending with *France* and *England*), Gilbert commissioned several of Daniel Chester French’s former co-collaborators, but he reserved *The Continents* (at the base of the building) for *Augustus Saint-Gaudens* and French. The Woolworth Building’s allegorical “four continents” have their roots in this earlier commission. 443



“America” and “Europe” were centrally located flanking the grand stairway into the building. *America* (top) is restless to stand and start work (a winged wheel symbolizing progress is being rolled by the crouching figure). *Europe* (bottom), with her globe and open book, reposes in the superiority of her centuries of learning. 444



At the fringes of the building are "Asia" and "Africa." Asia (top) has her feet resting on a plinth of human skulls and a chained slave bows next to her. Africa (bottom) is languid, dissipated and half-nude. "The Continents" are considered by many to be the finest examples of architectural sculpture in the United States.

445



"...In this gigantic pile it is estimated that 7,000 to 10,000 tenants will be housed - a number large enough to form a small municipality, with a mayor, executive departments and police force. Today there are over 6,400,000 people residing within twenty miles of the Woolworth Building. The population in this area is increasing at the rate of over 300,000 a year. No building in the entire city of New York is better situated so far as accessibility is concerned to the entire population, not only to the residents of the city proper but to the visitors to the metropolis. There is no section of the great city, the residents of which will not be able to enter the Woolworth Building within five minutes after leaving their surface, subway or elevated cars, and a great proportion of them will land directly in the building from the stations of the Broadway and Park Place subways. Within three or four years passengers from Brooklyn, from all parts of Manhattan, the Bronx, Queens and Richmond will be landed either at the door or within a block of the Woolworth Building when the 176 miles of new subways and elevated lines now definitely arranged for are completed." 446
RE: excerpt from "Above the Clouds and Old New York"



447

Knickerbocker Nights

448

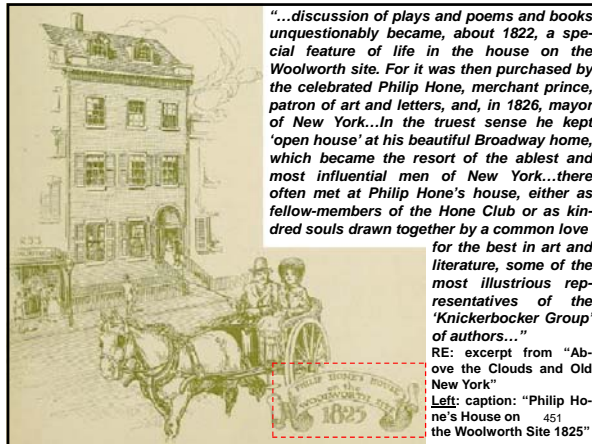


Above: caption: "Map: Site of the Woolworth Building and immediate neighborhood 1723 / Inset: Site of the Woolworth Building and immediate neighborhood 1913"

449

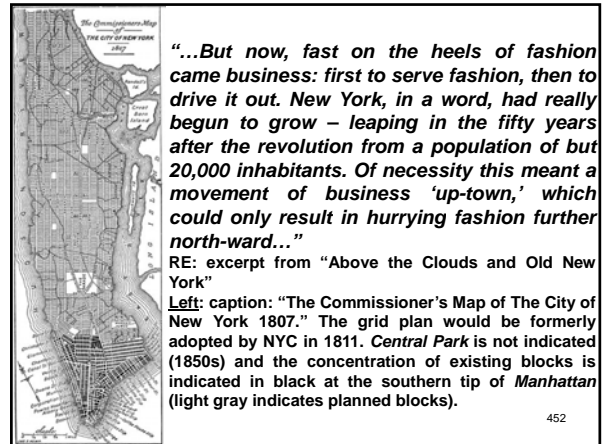


"...the nineteenth century was still young when, on the site of the Woolworth Building, there was built one of the largest and finest dwelling-places in the city, a house so imposing in appearance that it was long pointed out to strangers as one of the 'sights' of New York. Here leaders of wealth and fashion met on an evening to dine, to dance, to play cards, backgammon, bagatelle; perchance to discuss the latest play, the latest poem, the latest book..." 450
RE: excerpt from "Above the Clouds and Old New York"



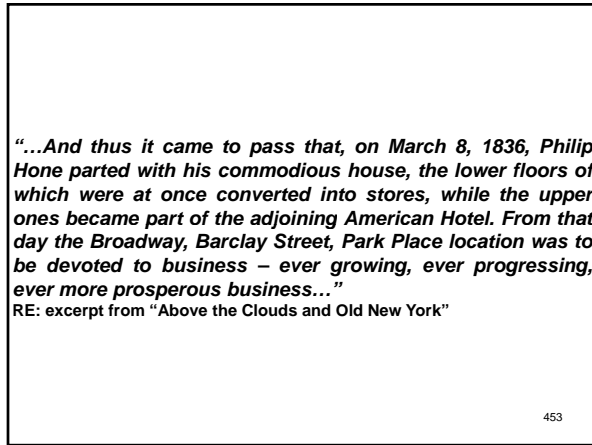
“...discussion of plays and poems and books unquestionably became, about 1822, a special feature of life in the house on the Woolworth site. For it was then purchased by the celebrated Philip Hone, merchant prince, patron of art and letters, and, in 1826, mayor of New York...In the truest sense he kept ‘open house’ at his beautiful Broadway home, which became the resort of the ablest and most influential men of New York...there often met at Philip Hone’s house, either as fellow-members of the Hone Club or as kindred souls drawn together by a common love for the best in art and literature, some of the most illustrious representatives of the ‘Knickerbocker Group’ of authors...”

RE: excerpt from “Above the Clouds and Old New York”
 Left: caption: “Philip Hone’s House on the Woolworth Site 1825”



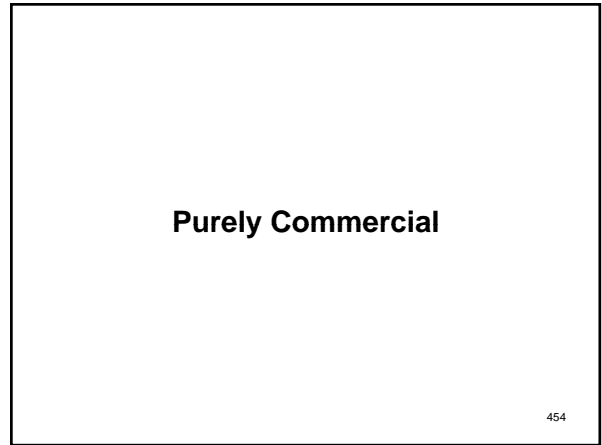
“...But now, fast on the heels of fashion came business: first to serve fashion, then to drive it out. New York, in a word, had really begun to grow – leaping in the fifty years after the revolution from a population of but 20,000 inhabitants. Of necessity this meant a movement of business ‘up-town,’ which could only result in hurrying fashion further north-ward...”

RE: excerpt from “Above the Clouds and Old New York”
 Left: caption: “The Commissioner’s Map of The City of New York 1807.” The grid plan would be formerly adopted by NYC in 1811. Central Park is not indicated (1850s) and the concentration of existing blocks is indicated in black at the southern tip of Manhattan (light gray indicates planned blocks).

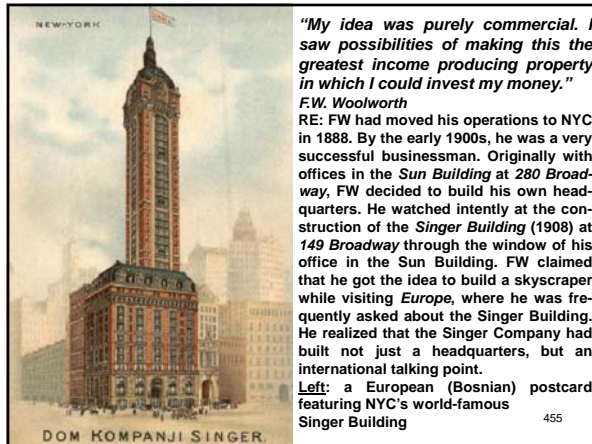


“...And thus it came to pass that, on March 8, 1836, Philip Hone parted with his commodious house, the lower floors of which were at once converted into stores, while the upper ones became part of the adjoining American Hotel. From that day the Broadway, Barclay Street, Park Place location was to be devoted to business – ever growing, ever progressing, ever more prosperous business...”

RE: excerpt from “Above the Clouds and Old New York”



Purely Commercial



“My idea was purely commercial. I saw possibilities of making this the greatest income producing property in which I could invest my money.”
 F.W. Woolworth
 RE: FW had moved his operations to NYC in 1888. By the early 1900s, he was a very successful businessman. Originally with offices in the Sun Building at 280 Broadway, FW decided to build his own headquarters. He watched intently at the construction of the Singer Building (1908) at 149 Broadway through the window of his office in the Sun Building. FW claimed that he got the idea to build a skyscraper while visiting Europe, where he was frequently asked about the Singer Building. He realized that the Singer Company had built not just a headquarters, but an international talking point.
 Left: a European (Bosnian) postcard featuring NYC’s world-famous Singer Building

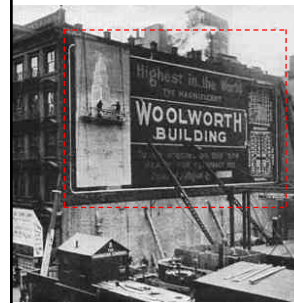


"Much had been said about the Woolworth Building, and though that structure had been taking form in my mind for a great many years, and though it is, as I have said, the result of one of my day dreams, I must in all honesty admit that it did not exactly originate with me. While in Europe a few years ago, wherever I went the men with whom I came in contact asked me about the Singer Building and its famous tower. That gave me an idea. I decided to erect a building that would advertise the Woolworth five and ten cent stores all over the world. I kept thinking about it, and finally, when the opportunity seemed to be right, I went ahead with my plans."

F.W. Woolworth

RE: one of the major points in favor of building the world's tallest building, in the mind of FW, was its advertising value which would provide a substantial "return on investment" and garner institutional pride among his employees and himself. It would also enhance the image of his company and, in kind, his family's social standing.

457

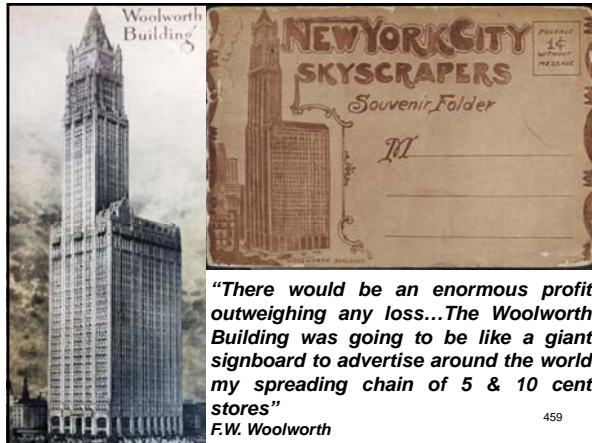


"Mr. Woolworth loved beautiful architecture and earnestly desired that his building should be noted for its beauty as well as for its practical convenience and substantial construction. He realized that beauty is an asset and has a business value, and was himself the strongest advocate thereof."

Cass Gilbert, Architect

Left: billboard at construction site

458



"There would be an enormous profit outweighing any loss...The Woolworth Building was going to be like a giant signboard to advertise around the world my spreading chain of 5 & 10 cent stores"

F.W. Woolworth

459

In 1908 Woolworth began talks with the *Irving National Exchange Bank* regarding the construction of a modest office building to house both companies' headquarters. Beginning in 1910, FW began taking steps to get the building constructed. Within a few months, he had selected and bought a site, arranged the financing of the project and chose *Cass Gilbert* to be his architect. FW decided to construct the building bearing his name on a block fronting 229 through 235 *Broadway*, one of NYC's premier shopping thoroughfares; near *City Hall Park* and opposite the *Post Office Building*. 229 previously had been the site of the *American Hotel* (1825-1866). The hotel was noted for its level of service and high-end clientele. Between 1821 and 1836, 235 *Broadway* was the fashionable home of *Philip Hone*, Mayor of NYC (1826). In 1851, the building included the office of *The Dagguerran Journal*, an early periodical dedicated to the art of photography. The block on which FW built his skyscraper reportedly cost him half of the \$13.5 million cost of the entire project.

460



Left: caption: "Woolworth Building, Upper Section of 12 Park Place (Showing Pain's Fireworks), 1910"
Right: caption: 229 Broadway, Woolworth Building, West End, Barclay Street Side (Showing Geo. H. Rosenblatt Mfg. Building), 1910"

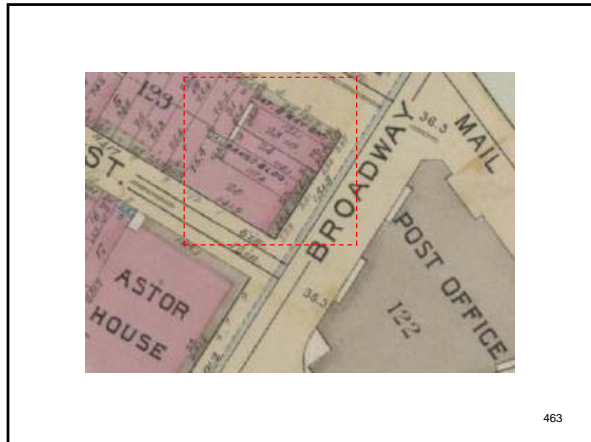
461



Above: map of NYC ca. 1775

Left: map of lower Manhattan ca. 1930s

462



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464

On July 6th 1910, *T.R. Johnson* drew "Scheme 26" as a full-block-front, symmetrical building. This despite the fact that FW would not acquire the adjoining parcels until 1911. In October 1910, Gilbert's office was at work on "Scheme 30" which had grown to 45-storeys and was tall enough to eclipse the 625-foot *Singer Building*. It appeared in a *New York Times* illustration on November 13th 1910. This time, the tower occupied only the portion of the corner lot that FW actually owned at the time at the corner of *Broadway* and *Park Place*. On December 20th 1910, FW sent surveyors to determine the precise height to the tip of the *Metropolitan Life Tower*, then the world's tallest building. Gilbert's sketch of December 31st 1910 shows the soaring proportions of the final design. On January 20th 1911, *The New York Times* published an interview with FW in which he boasted of his intentions to erect a 750-ft tower.

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"A machine that makes the land pay"
Cass Gilbert, Architect
 RE: his six-word explanation of the purpose of skyscrapers. Initially, FW had not planned on creating the "World's Tallest Inhabited Building." The first concept was for a 12 to 16-storey office building at the corner of *Broadway* and *Park Place*. As his conception of the building grew, FW acquired adjoining lots and the proposal went from 25 to 45-storeys, and finally to its ultimate height of 60-storeys.
 Above: renderings showing the evolution of Cass Gilbert's design

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By April 1911, a year after *Cass Gilbert* was given the commission, the final height of 792-feet and the full-block site was established. In early February 1911, *Cass Gilbert* gave his in-house perspective to the freelance architectural delineator *Hughson Hawley* for "coloring." Hawley's version (left) became the definitive image used in the public relations campaign to promote the *Woolworth Building*. FW copyrighted Hawley's painting and, on May 4th 1911, he distributed a photograph of it to the press in the hopes of capturing front-page coverage in the highly illustrated Sunday papers. It worked and the Hawley drawing occupied three full columns of the *Real Estate* section of the May 7th 1911 edition of *The New York Times* under the headline: "Woolworth Building Will Be World's Greatest Skyscraper." FW independently produced a copyrighted version of Hawley's rendering would serve to establish *Cass Gilbert's* groundbreaking design - even before construction began, as an instantly recognizable landmark and symbol of the achievements of FW and his retailing empire.

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"...did once say that the study he gave to the Woolworth Building destroyed his sense of scale for several years, because of the unprecedented attuning of detail to, for those days, such an excessive height..."
 RE: recollection of *Cass Gilbert's* daughter (concerning the design studies he did for the *Woolworth Building*). Aside from his client's lofty ambitions, *Gilbert* viewed his task pragmatically:
 • make the building responsive to practical and economic considerations;
 • make visual sense of its immense elevations, and;
 • express honestly the building's steel-cage structural frame through the architectural design
 The solution *Gilbert* devised was a slender tower rising over a wider and deeper base; in keeping with his own sense of proportion and scale. The use of a polychromatic terra cotta skin with Gothic detail would emphasize the height of the building (just as Gothic detail emphasized the height of a medieval cathedral) and, at the same time, lack the pretense of being a load-bearing masonry structure, which it most certainly was not.

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"...I have been asked if the building does not embody to some extent some of the requirements of the present Building Zone Resolution and was a sort of forerunner of 'set-back' buildings, and my answer to this question is no, that I had no thought of the 'set-back' building type but that the tower was simply a response to Mr. Woolworth's desire for a high structure of commanding proportions..."

Cass Gilbert, Architect (ca. 1920s)

RE: the silhouette of the tower, set center-forward of the base (left) and the relationship of the height, width and depth of the component parts of the building makes the Woolworth Building easily recognizable from a distance. In 1916, NYC passed a zoning regulation that would establish setback requirements for tall buildings to allow light and air into the streets below. Designed and built prior to the establishment of this law, it was not a consideration when Gilbert conceived and finalized the "base & tower" design. However, in many ways it's tall tower set over a low base is in keeping with the spirit of the law, though it was not consciously meant to be so.

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Role Model

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"...our street facade would assume the appearance of order and sobriety which comes of a uniform height and a continuous cornice line...the high part of the building occupies only about one-sixth of the area of the plot on which it stands. It depends on its own land for its light. It casts a shadow, to be sure, but it seriously interferes with the light of no surrounding property. It presents a finished face to all points of view. It adds to the picturesqueness of the skyline of the city, and its bulk rises well back of the street facade. It is certain, that the city cannot be built-up solidly with high buildings of the kind we now have unless we are to live in darkness."

Ernest Flagg, Architect

RE: his Singer Building/Tower (left)

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Top: caption: "The Future of Trinity Church." This wood engraving was created by Albert Levering and appeared in *Puck's* monthly magazine and almanac in 1907. It was telling of the growing public opinion that lower Manhattan was being overbuilt without consideration for the city's architectural heritage and/or the public's well-being. The time was fast approaching when something had to be done to take control of the situation.

Bottom: caption: "The Equitable Building – Biggest Skyscraper in the World." This building, completed in 1915, was "the straw that broke the camels back." At 1.1 million square-feet and rising thirty-eight storeys (537-feet) straight-up, just a few feet back from the curb line on all street frontages, it cast a giant shadow for blocks all around, cutting off light and air into the streets below. On the contrary, Ernest Flagg's Singer Tower of 1908 was seen as an enlightened design worthy of emulation. Thus, it inspired the "1916 NYC Zoning Resolution" which required predetermined setbacks thus allowing light and air into the street/s below.

472



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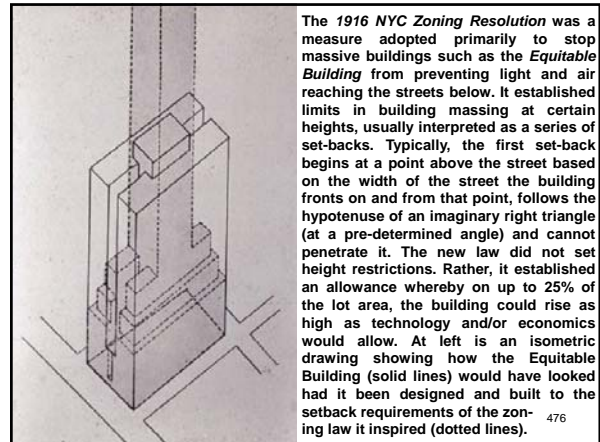
"It is not easy to imagine the feelings of a New Yorker exiled for a period of ten or twelve years who is returning to his native land by one of the ocean steamships. As he looks about from the deck of the vessel as it steams up the bay, the first glance that he obtains of the lower part of Manhattan Island will probably be, if he has not been forewarned, the greatest surprise of his life."

William Birmire, Engineer

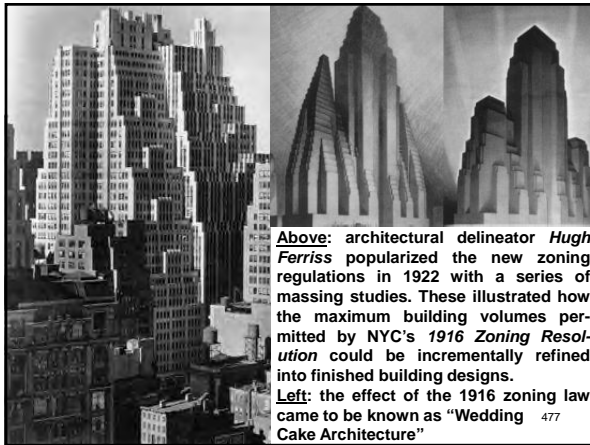
RE: by 1901, three-hundred NYC buildings rose nine-storeys, some to twenty-storeys

Above: caption: "New York Skyline from Jersey City" (ca. 1914)

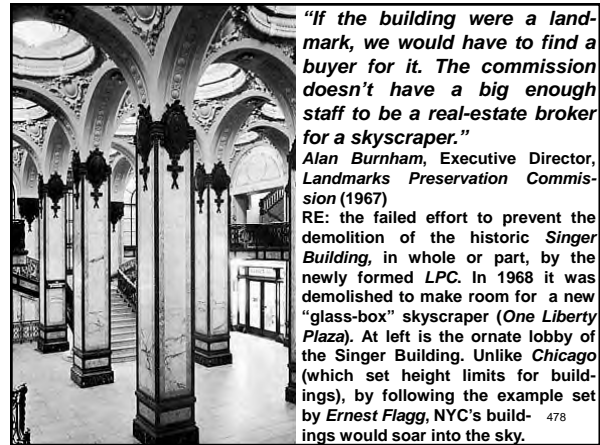
474



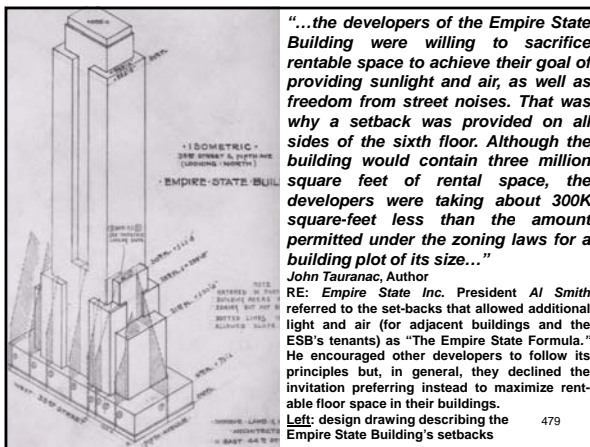
The 1916 NYC Zoning Resolution was a measure adopted primarily to stop massive buildings such as the *Equitable Building* from preventing light and air reaching the streets below. It established limits in building massing at certain heights, usually interpreted as a series of set-backs. Typically, the first set-back begins at a point above the street based on the width of the street the building fronts on and from that point, follows the hypotenuse of an imaginary right triangle (at a pre-determined angle) and cannot penetrate it. The new law did not set height restrictions. Rather, it established an allowance whereby on up to 25% of the lot area, the building could rise as high as technology and/or economics would allow. At left is an isometric drawing showing how the *Equitable Building* (solid lines) would have looked had it been designed and built to the setback requirements of the zoning law it inspired (dotted lines).



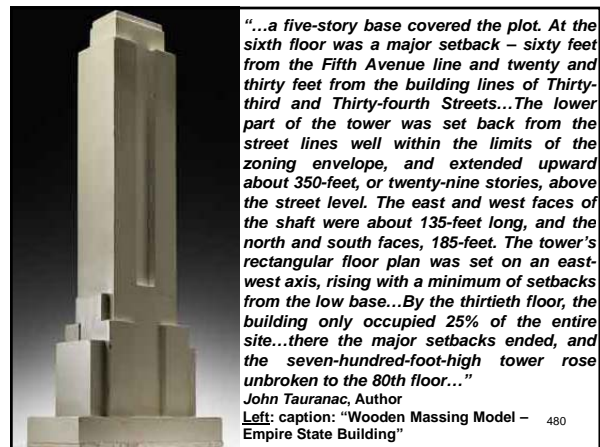
Above: architectural delineator *Hugh Ferriss* popularized the new zoning regulations in 1922 with a series of massing studies. These illustrated how the maximum building volumes permitted by NYC's 1916 Zoning Resolution could be incrementally refined into finished building designs.
Left: the effect of the 1916 zoning law came to be known as "Wedding Cake Architecture"



"If the building were a landmark, we would have to find a buyer for it. The commission doesn't have a big enough staff to be a real-estate broker for a skyscraper."
Alan Burnham, Executive Director, Landmarks Preservation Commission (1967)
RE: the failed effort to prevent the demolition of the historic *Singer Building*, in whole or part, by the newly formed LPC. In 1968 it was demolished to make room for a new "glass-box" skyscraper (*One Liberty Plaza*). At left is the ornate lobby of the *Singer Building*. Unlike *Chicago* (which set height limits for buildings), by following the example set by *Ernest Flagg*, NYC's buildings would soar into the sky.



"...the developers of the *Empire State Building* were willing to sacrifice rentable space to achieve their goal of providing sunlight and air, as well as freedom from street noises. That was why a setback was provided on all sides of the sixth floor. Although the building would contain three million square feet of rental space, the developers were taking about 300K square-feet less than the amount permitted under the zoning laws for a building plot of its size..."
John Tauranac, Author
RE: *Empire State Inc.* President *Al Smith* referred to the set-backs that allowed additional light and air (for adjacent buildings and the ESB's tenants) as "The Empire State Formula." He encouraged other developers to follow its principles but, in general, they declined the invitation preferring instead to maximize rentable floor space in their buildings.
Left: design drawing describing the *Empire State Building's* setbacks



"...a five-story base covered the plot. At the sixth floor was a major setback – sixty feet from the Fifth Avenue line and twenty and thirty feet from the building lines of Thirty-third and Thirty-fourth Streets...The lower part of the tower was set back from the street lines well within the limits of the zoning envelope, and extended upward about 350-feet, or twenty-nine stories, above the street level. The east and west faces of the shaft were about 135-feet long, and the north and south faces, 185-feet. The tower's rectangular floor plan was set on an east-west axis, rising with a minimum of setbacks from the low base...By the thirtieth floor, the building only occupied 25% of the entire site...there the major setbacks ended, and the seven-hundred-foot-high tower rose unbroken to the 80th floor..."
John Tauranac, Author
Left: caption: "Wooden Massing Model – *Empire State Building*"

Bearing the Burden

481

"In the erection of high buildings, the most important question we are obliged to contend with is pressure, both weight pressure and wind pressure, and its proportional distribution down to the foundations."
 George Simpson, Engineer

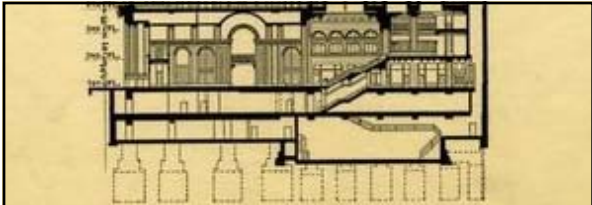
482

Soup Soil

483

"Excavation operations in New York offer a variety of obstacles seldom found in any other city. In the canon of Broadway, quicksand requires that these structures be anchored upon concrete. The Woolworth Building foundation is sunk through 115 feet of quicksand to bedrock and consists of 69 reinforced concrete piers. Within three blocks a new municipal-court building is under construction. Here the excavation contractors found themselves up against the problem of an underground stream that ebbed and flowed with the tide of the nearby East River. By the use of many high-power pumps and caissons, the concrete piers were sunk to bedrock in a manner resembling that of bridge construction. But Manhattan Island gradually loses its 'soup soil' with every block toward the north, and before reaching 34th Street, it consists of solid rock that may reach hundreds of feet below the surface. Still farther north, and especially in University Heights, the rocky outcrops resemble miniature mountains that must be blasted away before even the shallow excavations for houses and apartments can be made..."
 Popular Mechanics, 1922

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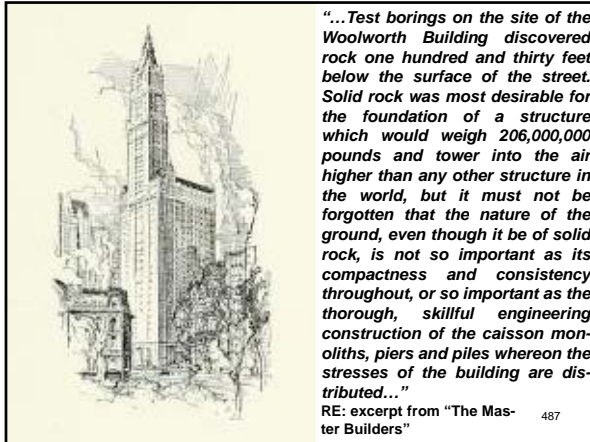


"...The foundation of a building rising seven hundred and eighty feet above the curb must be a foundation which can be depended upon, not only to bear the enormous weight in thousands of tons of steel and stone of a great structure, but to bear the stresses caused by vibration and wind. The whole burden must be carried by the foundation, and the greatest engineering skill is necessary to sound beneath the curb to learn the nature of the ground wherever the foundation is to be constructed. The weight of the structure must be equally distributed at given points on piers and columns, and the weight reduced to an average. The New York building laws are wisely made in the interests of safe building construction so far as the foundations are concerned..."
 RE: excerpt from "The Master Builders"

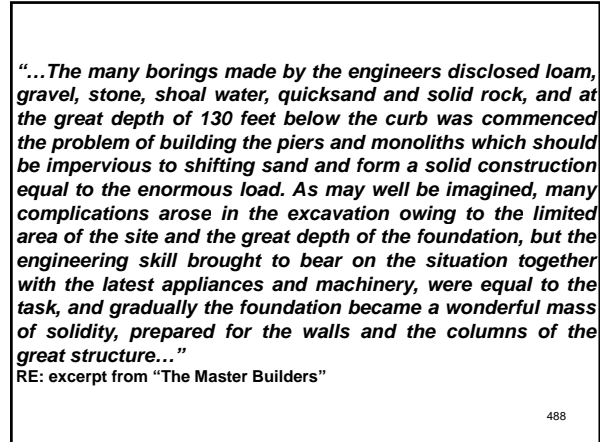
485

"...Owing to the extraordinary character of the building proposed, it was essential that a thorough investigation be made to determine the positive character of the geological condition existing between the surface of the ground and rock, also the nature of the rock itself, as a preliminary to preparing the plans and specifications for the foundations. The firm of Philips & Worthington, having had long experience in that particular line of engineering, was engaged by Architect Cass Gilbert to conduct such underground investigation by making borings by the hydraulic, auger and diamond drill processes to register the depths the caissons would have to be sunk to rock, and to drill into the rock not less than ten feet to be absolutely certain it was bed rock and not boulders. They found the average depth to rock below curb to be 116 feet..."
 RE: excerpt from "The Master Builders"

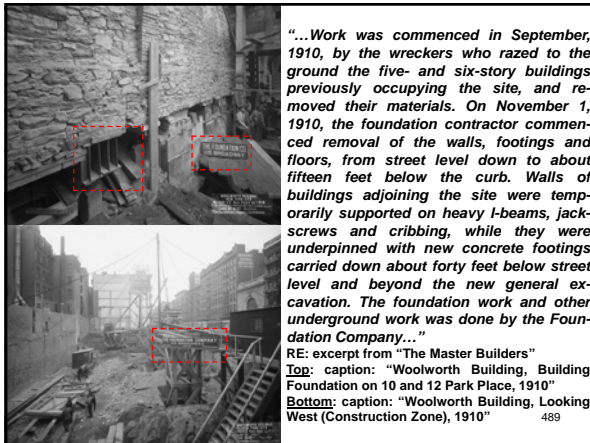
486



“...Test borings on the site of the Woolworth Building discovered rock one hundred and thirty feet below the surface of the street. Solid rock was most desirable for the foundation of a structure which would weigh 206,000,000 pounds and tower into the air higher than any other structure in the world, but it must not be forgotten that the nature of the ground, even though it be of solid rock, is not so important as its compactness and consistency throughout, or so important as the thorough, skillful engineering construction of the caisson monoliths, piers and piles whereon the stresses of the building are distributed...”
 RE: excerpt from “The Master Builders” 487



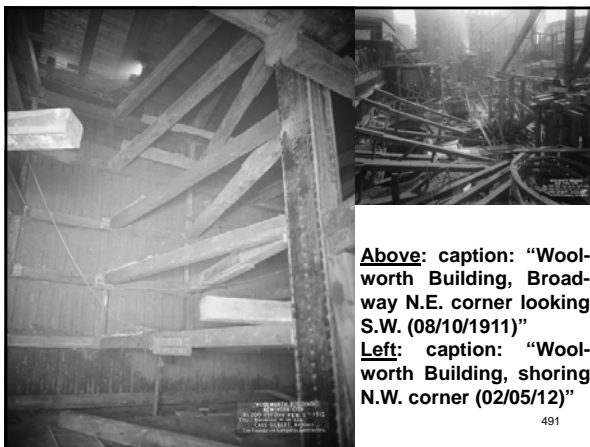
“...The many borings made by the engineers disclosed loam, gravel, stone, shoal water, quicksand and solid rock, and at the great depth of 130 feet below the curb was commenced the problem of building the piers and monoliths which should be impervious to shifting sand and form a solid construction equal to the enormous load. As may well be imagined, many complications arose in the excavation owing to the limited area of the site and the great depth of the foundation, but the engineering skill brought to bear on the situation together with the latest appliances and machinery, were equal to the task, and gradually the foundation became a wonderful mass of solidity, prepared for the walls and the columns of the great structure...”
 RE: excerpt from “The Master Builders” 488



“...Work was commenced in September, 1910, by the wreckers who razed to the ground the five- and six-story buildings previously occupying the site, and removed their materials. On November 1, 1910, the foundation contractor commenced removal of the walls, footings and floors, from street level down to about fifteen feet below the curb. Walls of buildings adjoining the site were temporarily supported on heavy I-beams, jackscrews and cribbing, while they were underpinned with new concrete footings carried down about forty feet below street level and beyond the new general excavation. The foundation work and other underground work was done by the Foundation Company...”
 RE: excerpt from “The Master Builders”
 Top: caption: “Woolworth Building, Building Foundation on 10 and 12 Park Place, 1910”
 Bottom: caption: “Woolworth Building, Looking West (Construction Zone), 1910” 489



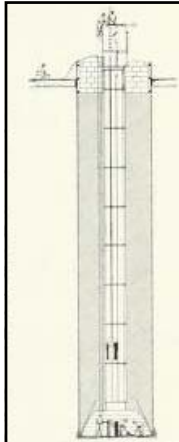
Top Left: caption: “Woolworth Building, under No. 1 Barclay Street”
 Top Right: caption: “Woolworth Building, under No. 229 Broadway”
 Left: caption: “Woolworth Building, under No. 3 Barclay” 490



Above: caption: “Woolworth Building, Broadway N.E. corner looking S.W. (08/10/1911)”
 Left: caption: “Woolworth Building, shoring N.W. corner (02/05/12)” 491

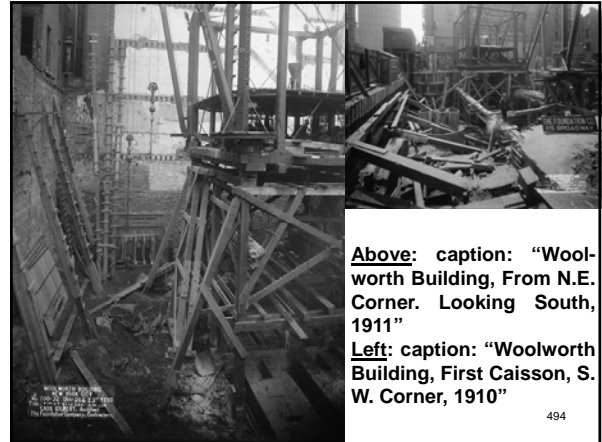


492



"...With one possible exception, the underground work of the Woolworth Building called for the largest single pneumatic caisson contract ever let in New York City or elsewhere. This work consisted of two main items; the sinking of the piers and the deep cellar excavation. Sixty-nine reinforced concrete piers, from ten to twenty feet in diameter, were sunk approximately one hundred and ten feet deep. They were installed by the pneumatic caisson process, and founded on bed rock. The material penetrated consisted entirely of the most treacherous material known to the builders and engineers - quicksand. The design of the caissons was in accordance with patents held by the Foundation Company, a typical cross-section of one of these being shown in accompanying cut..."

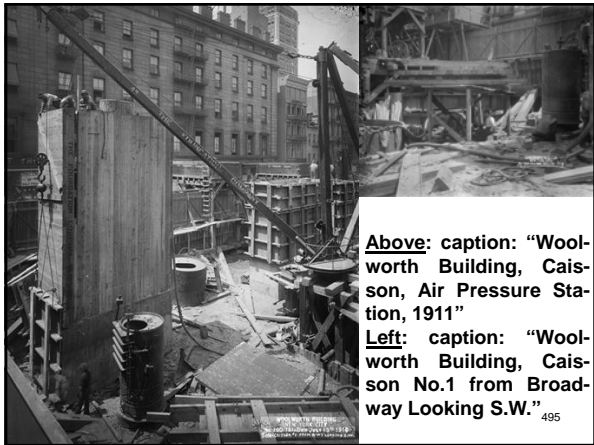
RE: excerpt from "The Master Builders" 493



Above: caption: "Woolworth Building, From N.E. Corner. Looking South, 1911"

Left: caption: "Woolworth Building, First Caisson, S. W. Corner, 1910"

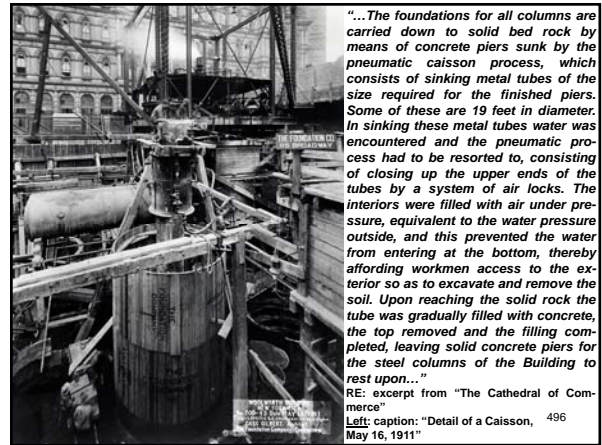
494



Above: caption: "Woolworth Building, Caisson, Air Pressure Station, 1911"

Left: caption: "Woolworth Building, Caisson No.1 from Broadway Looking S.W."

495

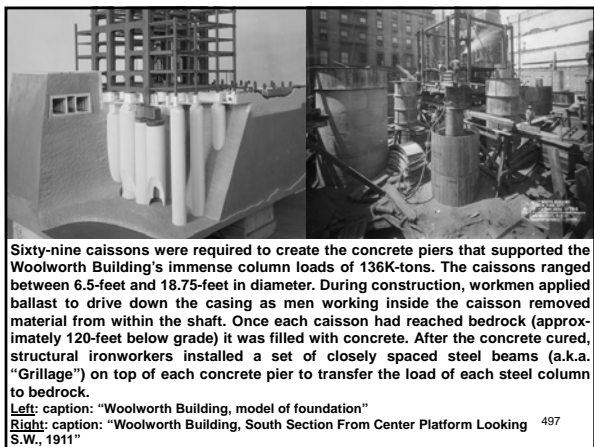


"...The foundations for all columns are carried down to solid bed rock by means of concrete piers sunk by the pneumatic caisson process, which consists of sinking metal tubes of the size required for the finished piers. Some of these are 19 feet in diameter. In sinking these metal tubes water was encountered and the pneumatic process had to be resorted to, consisting of closing up the upper ends of the tubes by a system of air locks. The interiors were filled with air under pressure, equivalent to the water pressure outside, and this prevented the water from entering at the bottom, thereby affording workmen access to the exterior so as to excavate and remove the soil. Upon reaching the solid rock the tube was gradually filled with concrete, the top removed and the filling completed, leaving solid concrete piers for the steel columns of the Building to rest upon..."

RE: excerpt from "The Cathedral of Commerce"

Left: caption: "Detail of a Caisson, May 16, 1911"

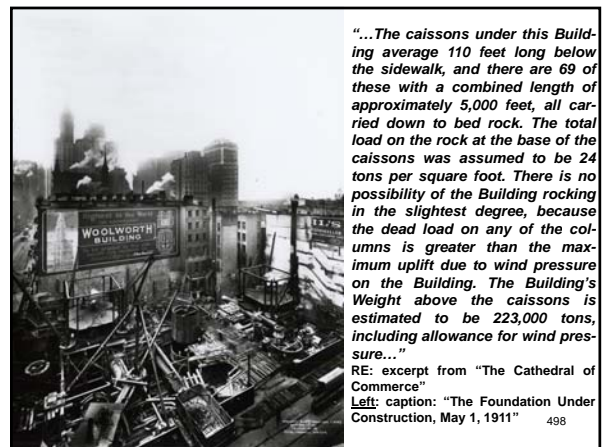
496



Sixty-nine caissons were required to create the concrete piers that supported the Woolworth Building's immense column loads of 136K-tons. The caissons ranged between 6.5-feet and 18.75-feet in diameter. During construction, workmen applied ballast to drive down the casing as men working inside the caisson removed material from within the shaft. Once each caisson had reached bedrock (approximately 120-feet below grade) it was filled with concrete. After the concrete cured, structural ironworkers installed a set of closely spaced steel beams (a.k.a. "Grillage") on top of each concrete pier to transfer the load of each steel column to bedrock.

Left: caption: "Woolworth Building, model of foundation"
Right: caption: "Woolworth Building, South Section From Center Platform Looking S.W., 1911"

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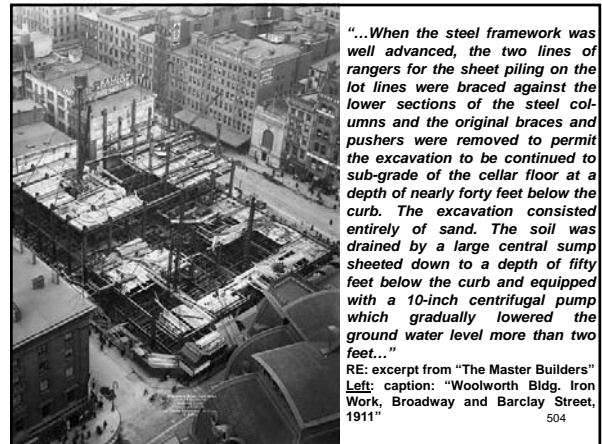
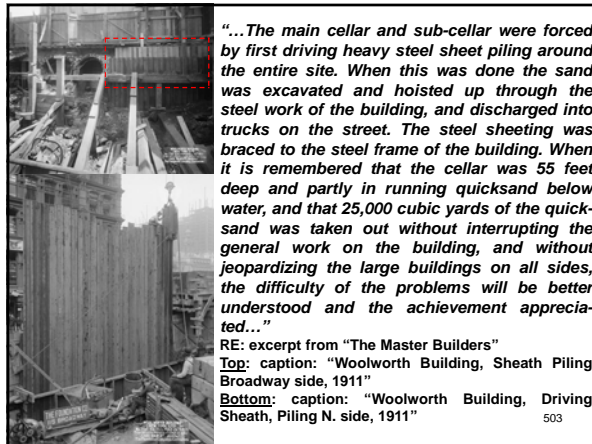
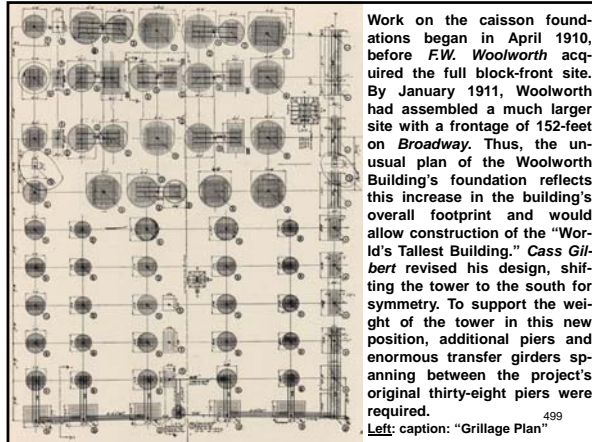


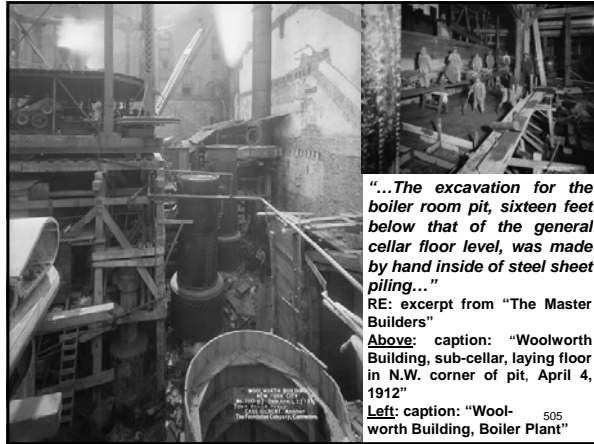
"...The caissons under this Building average 110 feet long below the sidewalk, and there are 69 of these with a combined length of approximately 5,000 feet, all carried down to bed rock. The total load on the rock at the base of the caissons was assumed to be 24 tons per square foot. There is no possibility of the Building rocking in the slightest degree, because the dead load on any of the columns is greater than the maximum uplift due to wind pressure on the Building. The Building's Weight above the caissons is estimated to be 223,000 tons, including allowance for wind pressure..."

RE: excerpt from "The Cathedral of Commerce"

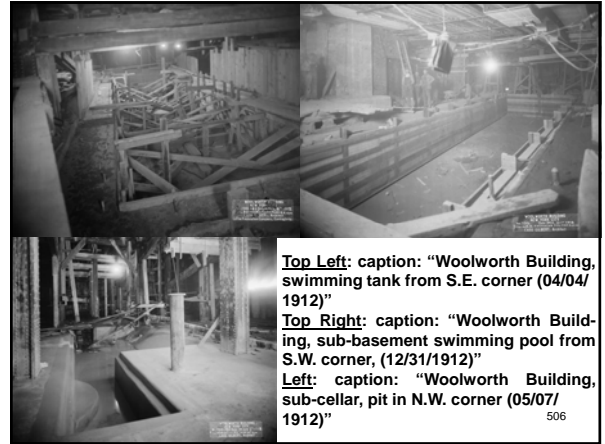
Left: caption: "The Foundation Under Construction, May 1, 1911"

498

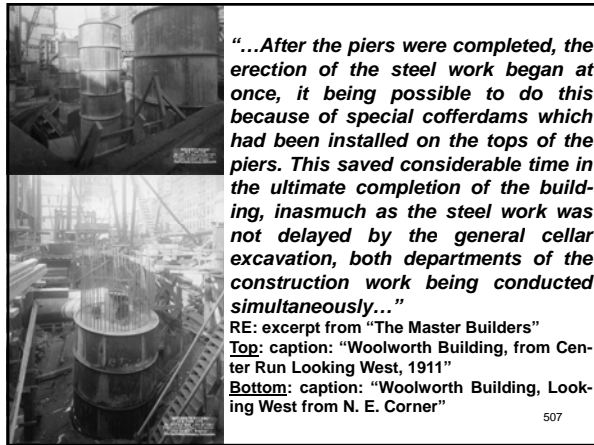




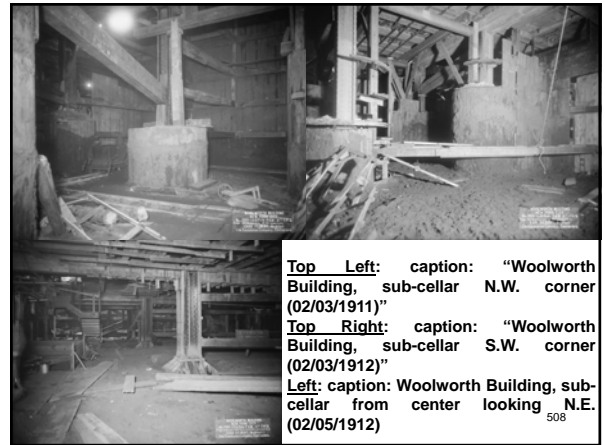
"...The excavation for the boiler room pit, sixteen feet below that of the general cellar floor level, was made by hand inside of steel sheet piling..."
 RE: excerpt from "The Master Builders"
 Above: caption: "Woolworth Building, sub-cellar, laying floor in N.W. corner of pit, April 4, 1912"
 Left: caption: "Woolworth Building, Boiler Plant" 505



Top Left: caption: "Woolworth Building, swimming tank from S.E. corner (04/04/1912)"
 Top Right: caption: "Woolworth Building, sub-basement swimming pool from S.W. corner, (12/31/1912)"
 Left: caption: "Woolworth Building, sub-cellar, pit in N.W. corner (05/07/1912)" 506



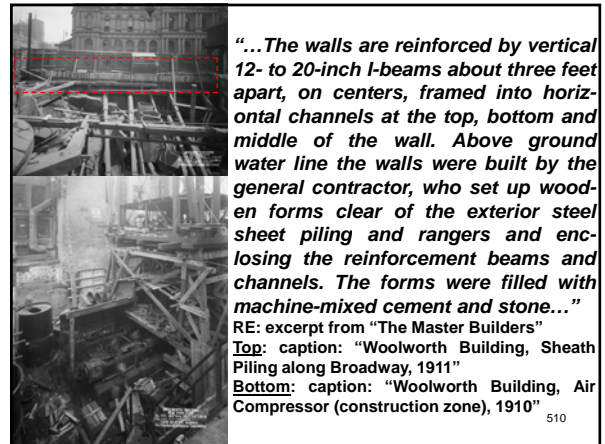
"...After the piers were completed, the erection of the steel work began at once, it being possible to do this because of special cofferdams which had been installed on the tops of the piers. This saved considerable time in the ultimate completion of the building, inasmuch as the steel work was not delayed by the general cellar excavation, both departments of the construction work being conducted simultaneously..."
 RE: excerpt from "The Master Builders"
 Top: caption: "Woolworth Building, from Center Run Looking West, 1911"
 Bottom: caption: "Woolworth Building, Looking West from N. E. Corner" 507



Top Left: caption: "Woolworth Building, sub-cellar N.W. corner (02/03/1911)"
 Top Right: caption: "Woolworth Building, sub-cellar S.W. corner (02/03/1912)"
 Left: caption: Woolworth Building, sub-cellar from center looking N.E. (02/05/1912) 508

Complete Satisfaction Obtained

509



"...The walls are reinforced by vertical 12- to 20-inch I-beams about three feet apart, on centers, framed into horizontal channels at the top, bottom and middle of the wall. Above ground water line the walls were built by the general contractor, who set up wooden forms clear of the exterior steel sheet piling and rangers and enclosing the reinforcement beams and channels. The forms were filled with machine-mixed cement and stone..."
 RE: excerpt from "The Master Builders"
 Top: caption: "Woolworth Building, Sheath Piling along Broadway, 1911"
 Bottom: caption: "Woolworth Building, Air Compressor (construction zone), 1910" 510



"...No less than seventy thousand barrels of Atlantic Portland cement was used in the general construction of the Woolworth Building. This quantity of cement for one building appears staggering at first, but when the enormous height of the structure and the extraordinary depth of the foundations are duly considered, seventy thousand barrels of cement, for a building weighing one hundred and twenty-five thousand tons, does not seem much after all..."

RE: excerpt from "The Master Builders"

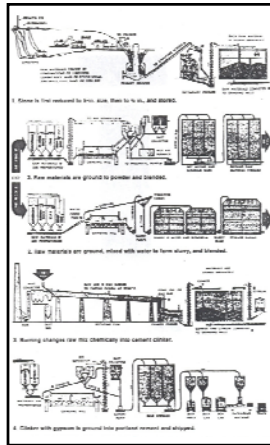
Left: caption: "Woolworth Building, Concrete Mixer (construction zone), 1910"

511

"...The contractors were well aware of the importance of using an absolutely reliable product when they specified and contracted for this particular cement. Even the great vaults of the Irving National Bank, which are part of the Woolworth Building, are built of Atlantic Portland cement and steel. The many millions of dollars in securities to be protected, besides the exceptional size of the building, demanded extraordinary strength and durability. It must not be imagined that Atlantic Portland cement was chosen for the important building without careful tests. The architect, general contractors and engineers made an incisive investigation of all brands of cement, and it was only after prolonged tests and analyses that the cement which proved to be the most satisfactory was decided upon. This was the Atlantic..."

RE: excerpt from "The Master Builders"

512



"...It was no matter of chance or favor, but the result of scientific merit. The wisdom of those who selected the Atlantic cement for the Woolworth is fully justified by the fact that this cement was chosen, after severe tests, for the Municipal Building, the highest apartment house, the largest hotel and the tallest loft building in New York City, besides great engineering projects, such as the Manhattan Bridge, and Blackwell's Island Bridge over the East River, and the Chelsea piers on the North River, which operations were under the supervision of the cement engineers of the Bridge and Dock Department, who have recorded the results of these tests of the Atlantic Portland cement and the complete satisfaction obtained..."

RE: excerpt from "The Master Builders"

Left: caption: "Steps in the manufacture of Portland Cement"

513



In 1871, David O. Saylor produced the first Portland Cement manufactured in the U.S. in Pennsylvania's Lehigh Valley (the Atlantic Portland Cement Company was founded there in 1906). Between 1871 and 1920, American PC production skyrocketed and the years 1871 to 1920 saw a major change from "traditional" manufacture of PC to a more technically aware, science-based industry. As popularity of PC grew over this period, so did its compressive strength; from 1800psi in 1871 to 3Kpsi by 1920. Although the limestone and clay used to produce PC changed very little after 1871, the main technological breakthrough came with the invention of the rotary kiln, which was first used commercially in the Lehigh Valley in 1889. This allowed for sufficient temperatures and production efficiency to produce low-cost, high-quality PC for the manufacture of concrete.

514

"...This total of the underground work involved an outlay of one million dollars, and was accomplished in less than contract time by the Foundation Company, of 115 Broadway, New York City. The principal quantities involved in the building of the foundation included about 6,000 yards of excavation, 24,000 yards of concrete, 300 tons of reinforcement steel, 10,000 linear feet of wooden sheet piling for the general excavation, and 20,000 square feet of wood and steel sheet piling for the boiler room and other excavations in the cellar..."

RE: excerpt from "The Master Builders"

515


Part 6

By Their Common Labor

516

Master Builders

517




"The master builders who built the awe-inspiring cathedrals of the Middle Ages gave expression to a deep and rich communal spirit. Closely knit in interests and united by a common love for the beautiful, they cooperated to embody in stone the noblest thought and aspirations of their time. Today we are deemed incapable of this kind of fruitful cooperation. Critics have often said that the commercialism of our age stands in the way of a group of men who would bend their best efforts to the production of a beautiful object by their common labor. That this indictment is unjust one has to know the extraordinary services rendered by all contractors and builders who aided in the erection of the Woolworth Building..."

F.W. Woolworth
 RE: excerpt from the Foreword to "The Master Builders" 518

"...From the time that the first spade of earth was turned to the last touch on the topmost spire of the tower every one of the hundreds of men, from chief executive to day laborer, worked harmoniously and in unison like a well-trained army of veterans. The man of theory and the man of practice, the man who worked with his brains and the man who worked with his hands, all united to translate the thing that was on paper into the concrete handiwork of the master builders..."

F.W. Woolworth
 RE: excerpt from the Foreword to "The Master Builders"

519



"...But what seemed most remarkable to the layman as well as to the experienced architect and builder was the intelligent manner in which the individual contractor approached his appointed task. Each contractor came to the work with a clear conception of his special duty and a realization of his own responsibility. Each contractor worked as a unit in cooperation with the other contractors, and all together they formed a working organization that was responsible for the completion of the greatest structure in the world in record time and without serious delay or mishap..."


F.W. Woolworth
 RE: excerpt from the Foreword to "The Master Builders"

Left: caption: "Workers high atop the Woolworth Building" 520

"...Of course, such splendid preparedness bespoke a well systematized organization that could measure up to an unusual emergency. But it was this very fact that determined the selection of a contractor for work on the Woolworth Building. He not only had to be the best in his field, have the best material at his disposal, the best talent at his service, but it was also essential that he have an organization back of him which was thoroughly adequate and had reached the maximum of efficiency..."

F.W. Woolworth
 RE: excerpt from the Foreword to "The Master Builders"

521



"...Personally I believe that the contractors and workers who aided in the completion of the Woolworth Building are rightfully proud of their part in the work, not merely because of the magnitude of the undertaking but also because of the exacting conditions that were demanded of them. But in quality of work and material, in speed and resourcefulness, each contractor fulfilled all conditions, thus giving him the rightful title of 'Master Builder.'"

F.W. Woolworth
 RE: excerpt from the Foreword to "The Master Builders"

Left: caption: "Mr. Woolworth" 522

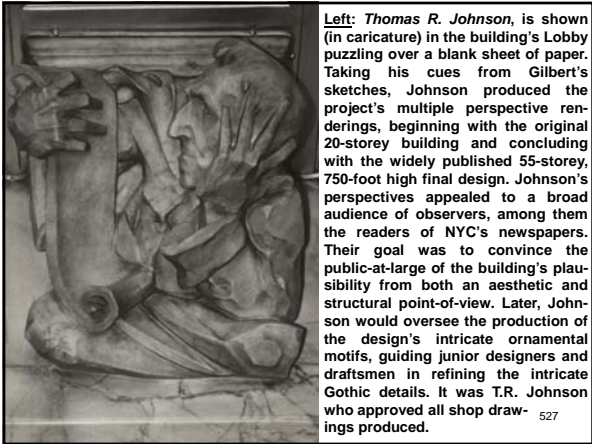
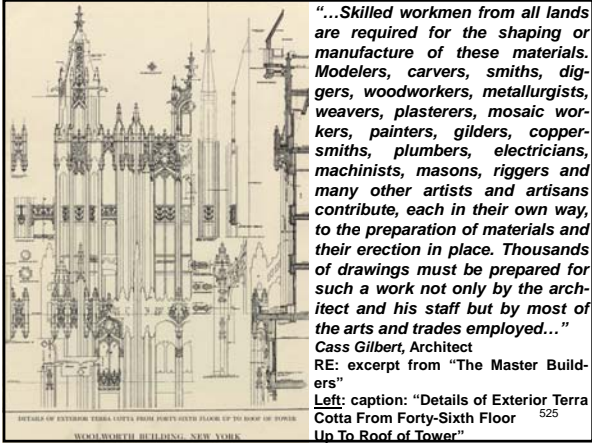
The Architect's Approbation

523

"...The building of today is a complicated organism such as has probably never existed in any preceding age. The materials are gathered together from all over the world, they include iron, copper, lead, tin, zinc, nickel, silver and gold; stone brought from quarters hundreds of miles away, marble mined on the slopes of the Alps in Northern Italy, in the snowy hills of Vermont, or in the sunny isles of the Greek Archipelago are wrought into these structures; asphaltum from South America, pitch and tar from our native forests; foreign-made cements and cement in vast quantities from our own country; oil from far-away China; oak from England; mahogany from the islands of the Caribbean Sea; walnut from the Circassian Mountains; glass from the borders of the Ohio and from the factories of Bohemia and Venice; in short, from almost countless sources are these materials brought together and assembled..."

Cass Gilbert, Architect
RE: excerpt from "The Master Builders"

524



"...Skill and organization to the highest degree is absolutely essential, and, more than this, both moral and physical courage are necessary to success – moral courage on the part of owners, architects, engineers and contractors in the willingness to undertake so large an enterprise and to persist in the effort until completion, and physical courage, compared with which the courage of the soldier under fire is not more heroic, for in the mine and quarry, in the excavation and the caisson, in the hazardous height to be scaled by the workmen erecting the structural steel, terra cotta, and the roofing, or trades associated with them, lurk imminent and terrible physical dangers every hour of every day, and such work is quoted as 'extra hazardous,' for so it is in every sense of the word..."

Cass Gilbert, Architect
RE: excerpt from "The Master Builders"

528



“...Out of this common effort arises a common interest and the men engaged therein are linked by ties, the strength of which they themselves do not realize. The recognition of this common interest by employer and employed alike is the best guarantee of future joint effort, for it is only by the combination of the interests of capital and labor that organized society can successfully exist. The building which we have been engaged upon can well be said to symbolize this unity of effort and of interest of all who have had a part in its creation...”

Cass Gilbert, Architect
RE: excerpt from “The Master Builders”
529

“...This building will house thousands of tenants and within its walls will be transacted business of vast extent and importance. The wise liberality of the owner provided that the structure should be enriched and beautiful so as to give pleasure to the millions of people who will see it. His effort therefore was not alone to make it a purely commercial structure but to clothe it with beauty and to make it a worthy ornament to the great city of New York. Others must judge how far this purpose has been achieved. He has fulfilled the eloquent invocation of Daniel Webster, who said ‘Let us develop the resources of our land, call forth its powers, build up its institutions, promote all its great interests, and see whether we also, in our day and generation, may not perform something worthy to be remembered.’ We may all have a just pride in having contributed to this endeavor...”

Cass Gilbert, Architect
RE: excerpt from “The Master Builders”
530



“...I take this occasion to congratulate the contractors, sub-contractors, and all those who have furnished material or labor upon the completion of the work in which we have been engaged, and to thank them all for the spirit of cooperation which pervaded the work from the beginning. I hope that this expression of appreciation will be conveyed to the artists, the designers, the artisans, the workmen, and the laborers as well as to those who assumed the responsibility of contract obligations for, speaking broadly, I believe that each has fulfilled his duty as he saw it and has contributed in proportion to his ability and his opportunity.”

Cass Gilbert, Architect
RE: excerpt from “The Master Builders”
531
Left: caption: “Mr. Gilbert”

In Appreciation of Excellence

532



“...It may be asked why New York City attracts the best class of Master Builders – men who are specialists in their particular line of business, whether it be excavating, brickwork, machinery, steel construction, plastering, or any other branch of building construction. The answer is: the appreciation of excellence in the work and better reward than can be had in any other part of the world. ‘Honor to whom honor is due’ is not yet worn out as a saying, and the small tribute to the Master Builders of the world’s highest building construction is an endeavor to place the wreath of merit where it is well deserved...”

Louis J. Horowitz - President, Thompson-Starrett Company, General Contractor
RE: excerpt from “The Master Builders”
533
Left: caption: “Mr. Horowitz”



Left: Louis Horowitz, president of the Thompson-Starrett Company making a telephone call (in caricature) in the building’s Lobby. The telephone was still relatively new at the time and served to facilitate speedy communications between the office and the site. Thompson-Starrett had risen to prominence in the construction industry, becoming a recognized “national builder.” Along with the George A. Fuller Company, it had reorganized the construction industry under the more efficient single-contract system. Able to complete large-scale projects in record time, Horowitz emphasized efficiency and financial control throughout the construction process; an approach FW appreciated.
534

"All my nightmares had to do with the black despair of failing to get that mighty contract"

Louis J. Horowitz - President, *Thompson-Starrett Company*, General Contractor RE: the competition between all of NYC's major builders for the Woolworth Building's *General Construction* contract. By 1900, the business model of the "General Contractor" had become standardized, particularly for large-scale projects. These companies bid a fixed price to deliver a finished building to the client on a pre-established date. They were responsible for purchasing all materials and required labor as well as the organization of the worksite. Typically, they owned their own heavy equipment and sub-contracted many of the building trades directly when it was cost-effective to do so. "On time and on budget" was the GC's golden rule. Horowitz himself would espouse the importance of "a comprehensive time schedule which imposed a rational and systematic order from start to finish over all lines of work." Thompson-Starrett contracted to be paid \$300K as their fee and for it, they delivered the building on time for a guaranteed construction cost of \$4,308,500. Overall, the construction of the *Woolworth Building* took twenty-nine months to complete; from the beginning of the foundation excavations in November 1910 through to the topping out of the steel frame on July 1st 1912 and the completion of the ornate terra cotta facade and interior public spaces in April 1913. The complicated foundation work took a full year and was executed under a separate contract with *The Foundation Company* that FW personally negotiated and supervised, well before he signed the General Construction contract with *Thompson-Starrett* on April 20th 1911.

The *Thompson-Starrett Company*, headed by *Louis J. Horowitz*, was in operation from 1899 until 1968, and was, along with the *George A. Fuller Company*, a pioneer in the construction of early skyscrapers in NYC. Thompson-Starrett's list of construction projects includes numerous historic buildings, including:

- the *Equitable Building* (Manhattan, 1915);
- the *General Motors Building* (Detroit, 1923);
- the *American Stock Exchange* (Manhattan, 1930);
- the *City of New York Municipal Building* (Manhattan, 1914);
- *Union Station* (Washington, D.C., 1907), and;
- the *New York State Pavilion* (New York World's Fair, Flushing Meadow, Queens, 1964)

Construction began in April 1910, with the demolition of existing buildings on the site and, by August 26th 1911, the building's foundations were complete. Construction of the steel frame began August 15th 1911 and rose at the rate of 1½-stories a week, closely followed by the attachment of the terra cotta cladding. By April 6th 1912, the steel frame had reached the thirtieth floor (the top of the "base" or main building) and the forty-seventh floor of the tower by May 30th 1912. The topping-out ceremony took place on July 1st 1912. The building was completed by April 1913, in record time.



Left: *William Sunter*, Thompson-Starrett's superintendent, with ruler in hand pours over a thick project schedule (in caricature) in the building's Lobby. Architect *Cass Gilbert* said he was "the most efficient man on the job" because of his management skills and adherence to the tight construction schedule. FW treated the raw materials for the building as a commodity, demanding the best and paying cash up-front, there-by securing significant discounts. Steel was purchased at the foundry and marble at the quarry, one floor at a time. He supervised every detail, often to the dismay and consternation of Sunter and his staff.

The Mother of Invention

"...high growths of iron, slender, strong, light, splendidly uprising toward clear skies..."
 Walt Whitman, Poet
 RE: excerpt from his poem "Manhattan" (1881)



"...a new difficulty arose: the brick walls at the base became thicker than ever, and their cost was enormous; their weight, too, was excessive for the foundations, and it was soon found that the ground space they occupied caused great loss to owners. So thick, in fact, were the walls at that time that if an owner built on a narrow lot he had little more than an entrance hallway between the side walls on the ground floor..."

RE: excerpt from "The Master Builders"
 Above L&R: caption: "Monadnock Building Chicago: North End, Burnham and Root, 1891; The north end of the building rises to sixteen stories, using load bearing masonry walls that range from 6 feet in thickness at the base to approximately one-foot at the top"



“By skyscraper is meant a building that exceeds in height the practical limit of masonry construction...The absolute and first essential in the structural creation of a skyscraper is the metal (ferrous) skeleton”

RE: excerpt from a 1939 report on the origins of skyscrapers. The term “Skyscraper” is derived from sailing ships. The topmost sail on a fully-rigged sailing ship was referred to as “The Skyscraper” by sailors. When the Age-of-Sail gave way to the Age-of-Steam in the latter part of the 19th Century, many sailors – known for the affinity for working at great height – were recruited as ironworkers (a.k.a. “House Smiths”). Thus, they gave the name of the tall buildings they worked on the title: “Skyscraper.”

542

“A practical architect might not unnaturally conceive the idea of erecting a vast edifice whose frame should be entirely of iron, enclosing that frame and presenting it by means of a casing of stone”

Viollet-le-Duc, French Architect (mid-19th Century)

543

Flash of Genius

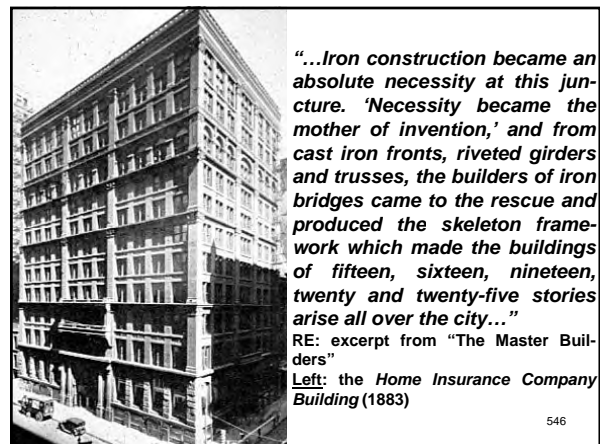
544

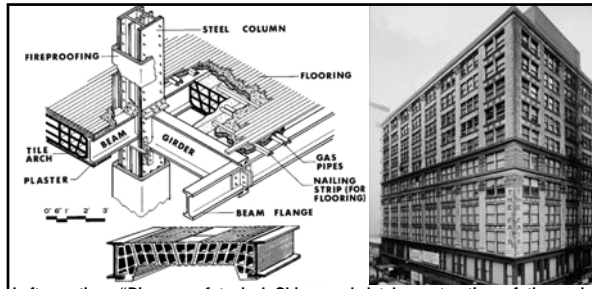
“He reached a snag early one afternoon and found himself looking out his office window in frustration. Rather than continue to torture himself he went home for the day. His wife was startled to see him so early and thought he might be ill. Getting up suddenly from her chair where she was reading, she looked around for the most handy place to set down her book, and accordingly laid it on top of a bird cage...Jenney jumped with surprise when he noticed that this lightweight birdcage could support a heavy load without the slightest difficulty. Back to the office Jenney went with the clue to the skyscraper; cage design.”

George Douglas, Historian

RE: recounting architect William LeBaron Jenney’s “flash of genius.” The iron (or steel) “cage frame” (along with the elevator) would make the skyscraper possible. He used wrought-iron for the world’s first skyscraper: Chicago’s ten-story Home Insurance Company Building (1883).

545





Left: caption: "Diagram of typical Chicago skeletal construction of the early nineties based on William Le Baron Jenney's Fair Building, Chicago, 1890-91. Typical fireproof floor construction using flat terra-cotta arches." The Fair Store was one of the first buildings to use fireproof steel frame construction. The separation of the perimeter columns from the exterior walls freed the exterior envelope from load-bearing responsibilities.

Right: caption: "Fair Store, Chicago, 1891, William LeBaron Jenney and W.B. Mundy. At the time of its construction it was the tallest metal frame building – nine stories (two were later added)." 547

"It may stand a short gust of wind blowing very hard, but if this were to keep up for any length of time, the cage might begin to sway. Then matters would be serious. The rivets would be cut off and the oscillations would increase with each swing backward and forward, soon wrecking the building."

George B. Post, Architect

RE: prominent NYC architect expressing his doubts to a *New York Times* reporter concerning the viability of skyscrapers in sustained high winds. the *Tower Building* (1889) – NYC's first official skyscraper. At only 21.5-feet wide by 160-feet high, on windy days crowds would gather (at a safe distance, of course) waiting for it to be blown down. Thus, it came to be known as "The Idiotic Building" (after all, only an idiot would build such a tall, slender building). The crowds always went home disappointed.

548



"When the actual construction of the building began, my troubles increased tenfold. The mere suggestion of a building 21.5-feet wide, rising to the height of 160-feet above its footings, filled everybody who had no particular concern in the matter with alarm that the building would blow over...One Sunday morning, when the walls of the building were ready for the roof...the wind was blowing a hurricane. I secured a plumb-line and began to climb the ladders that the workmen had left in place when they quit work the previous evening...When right, I crawled on my hands and knees along the scaffolding and dropped the plumb-line. There was not the slightest vibration. The building stood as steady as a rock in the sea."

Bradford Gilbert, Architect, 1890

RE: 50 Broadway - a.k.a. "The Tower Building," at left 549

"Before the development of the method of steel skeleton construction, extreme height was impractical, but after its success was demonstrated in 1889, in the Tower Building of ten stories, a great impetus was given to increase height"

R.P. Bolton, Author

550

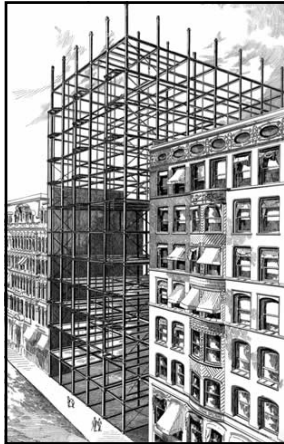
For a More Profitable Investment

"...The higher the ratio of available floor space in a building to the area of the plot which it occupies, other conditions being equal, the more profitable will be the investment. This area of floor space is mainly dependent on the number of stories and the space taken up by the walls and interior columns. In the heart of the New York business district, where every square foot of ground is very valuable, it is highly important to increase this ratio to the greatest extent possible..."

RE: excerpt from "The Master Builders"

551

552



“...Before the introduction of the steel ‘skeleton’ frame-work, the thickness of walls and cross-sectional area of interior columns required to support the loads for buildings over about ten stories high became so great as to seriously reduce the available floor and window space in the lower stories. On account of its great strength the ‘skeleton’ steel frame-work carries the permanent floor, roof, and wind loads, as well as the weight of the walls themselves directly to the foundations, with a comparatively small loss of floor and window space, for a height of building far exceeding that possible in any other type of construction. Only in recent years has this type of construction reached the degree of perfection required to build such a gigantic structure as the Woolworth...”
 RE: excerpt from “The Master Builders”
 Left: caption: “Steel-cage construction” 553

Superstructure

554

“...the Woolworth most unmistakably denotes its skeleton. Nobody could possibly take it for a masonic structure. The uprights of the steel frame are felt throughout and everywhere...”
 Montgomery Schuyler, Architectural Critic

555

“...In the superstructure there are about 24,000 tons of structural steel, 17,000,000 common brick, 7,500 tons of terra cotta, 1,800 square feet of floor tiles, 1,800,000 square feet of partition tiles, and 2,500 square feet of cut stone...The 24,000 tons of structural steel required in the construction of the building were furnished by the American Bridge Company and fabricated in its Philadelphia and Pittsburgh plants in about 45 weeks. The assembling and riveting together in the shape of the huge girders and columns was only accomplished in the highly satisfactory manner obtained by the aid of the most modern shop appliances...”
 RE: excerpt from “The Master Builders”

556



“...The design of the steel work for the building does not embody any strikingly new features, but it does include to an unusual degree a combination of many of the important developments for structures of a similar class. The great height of the building and the wind load assumed developed enormous stresses in the steel work and necessitate the use of huge columns and girders. The sixty main columns support an estimated weight of 125,000 tons, the maximum load on one column being about 9,500,000 pounds. The greatest cross sectional area used for a single column is about 700 square inches. The heaviest column has a cross sectional area of 640 square inches, a length of 30 feet and a weight of 45 tons. The columns rest on cast steel pedestals supported by massive girders and grillages of beams resting on reinforced concrete piers, which are taken to solid bed-rock at an average depth of 115 feet below the curb level. One of the foundation girders weighs 65 tons, is 8 feet deep, about 6 feet wide and 23 feet long. This girder was taken from the lighter to the building by a 100-ton truck drawn by 42 horses...”
 RE: excerpt from “The Master Builders”
 Left: caption: “Woolworth Building, looking north along Broadway area” 557

Stand Alone

558



“...Owing to the great height of the tower of the Woolworth Building, careful calculations were made by the engineers regarding elasticity, vibration and the danger from wind pressure, and a system of wind-bracing was designed to protect not only the tower but every part of the building from both ordinary and extraordinary vibrations and wind forces. It was assumed that the high wall areas might be exposed to a pressure of thirty pounds per square foot, which would be transmitted through the steel framework to the tops of the concrete piers about thirty feet below the curb level. No reliance could be made on the walls and partitions except those parallel to the long sides of the building. The tower was designed independently, as though it stood alone...”

RE: excerpt from “The Master Builders”
 Left: a ca. 1920 postcard featuring the tower portion from base to top as a freestanding structure

559

“...The wind load of 30 pounds per square foot, which is equivalent to a velocity of about 80 miles per hour, is very severe when considered as acting on such a large area at one time, and the stresses resulting from this assumption are necessarily very large, but the final result of proportioning the steel work for such a condition gives a very rigid structure. The maximum wind load on a single column is 2,500,000 pounds, with an additional bending stress from the portal bracing of 200,000 pounds. Wind bracing in the form of brackets, curved portals, knee braces, gusset plates on deep plate girders and diagonals from floor to floor for the tower (below the fourth floor) transfer the wind stresses to the columns, no reliance being placed on walls and partitions except those parallel to the long sides of the building...”

RE: excerpt from “The Master Builders”

560



“...At the very top, where scientific observations have been made, no vibration what-ever was detected. The Tower is braced to take care of wind strains by a system of portal braces like those used at the ends of bridges. These braces occur in all stories, so that wind blowing at any floor level is transmitted through the braces to the floors below successively until it reaches the foundation. This form of bracing is unusual in building construction, but it was considered by far the best solution of the difficult engineering problem at hand...”

RE: excerpt from “The Cathedral of Commerce”
 Left: caption: “Diagram of Tower Wind Bracing”

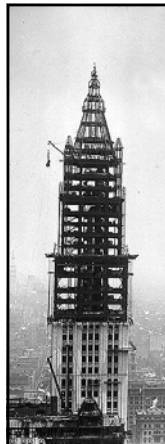
561



“...In the tower the inclined members of the pyramidal roof provide wind bracing from the top down to the fiftieth floor, and from the fiftieth to the forty-seventh floor the wind stresses are carried to the four interior columns, with gusset plate connections to the floor beams...”

RE: excerpt from “The Master Builders”

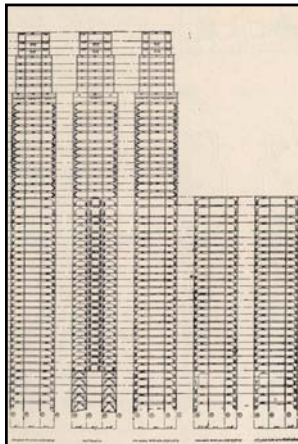
562



“...From the forty-seventh floor to the forty-second floor the wind stresses are carried down through the outer columns, with solid web-knee brace connections to the wall girders, and from the forty-second to the twenty-eighth floors the bracing consists of deep wall girders and knee braces; below the twenty-eighth floor it consists entirely of solid-web full-depth plate girder portals...”

RE: excerpt from “The Master Builders.” To resist the considerable wind pressure developed in its exposed lower Manhattan location, the Woolworth Building’s columns and beams were connected to form braces in a structural configuration that allowed for window and hallway openings. Below the setback, structural engineer Gunvald Aus relied primarily on portal braces, which rigidly connected the columns with arches made from steel. Above the 30th Floor, knee braces (that formed a K-shape) were used at the corners of the tower. At the building’s base, full-height diagonal braces were employed.

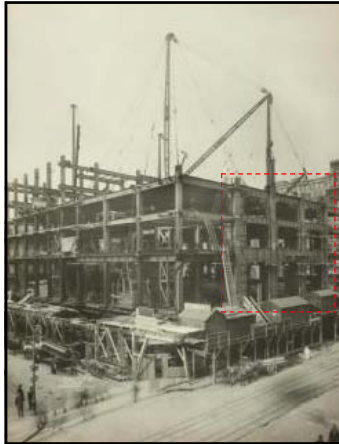
563



“...On the Broadway front the bracing of the tower consists of double plate girder portals with flange angles. In the basement and sub-basement the portals have the bottom flanges reinforced by cover plates extending around the curved portion of the flange. From the tenth to the twenty-seventh storey all the panels are braced with single portals having pairs of flange angles which are provided with top chord reinforcement plates from the fifth to the fifteenth storey in the corner panels. From the twenty-eighth to the fortieth storeys the Broadway face of the tower is braced by wall girders. At the forty-second floor, where the upper stories of the tower are offset about seven feet inward, the depth of the wall girders is increased and knee braces are omitted. From the forty-third to the forty sixth storey the wall girders have the same uniform depth and are connected to the columns through gusset plates projecting beyond the top and bottom flanges to form knee braces at both ends in the center panel and at one end in the side panels...”

RE: excerpt from “The Master Builders”
 Left: caption: “Diagram of Tower Wind Bracing”

564

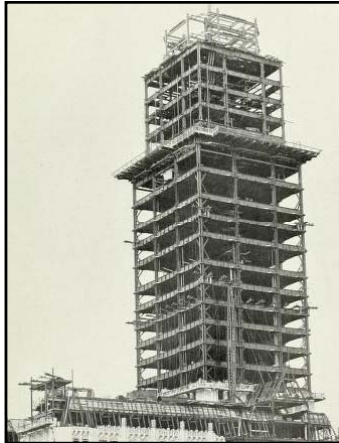


“...In the four lines of columns perpendicular to the Broadway face of the tower the bracing consists of plate girder portals which are double and have flange angles to the fifth floor, above which they are single. Above the fourth floor the bracing in the west face of the tower is the same as that in the Broadway face, but below the fourth floor architectural considerations permitted diagonal braces. The basement and first floor girders are plate girders and those on the second, third and fourth floors have pairs of 15-inch angles back to back...”
 RE: excerpt from “The Master Builders”
 Left: caption: “December 28, 1911”

565

On the Side of Safety

566



“...The tower was considered as a unit by itself, and the columns and wind bracing are proportioned to carry the load directly to the ground, without the aid of the main portion of the building. This is another rather severe assumption on the side of safety...”
 RE: excerpt from “The Master Builders”

Above & Left: caption: “Skeleton Structure of Woolworth Building Steel – Tower Portion”

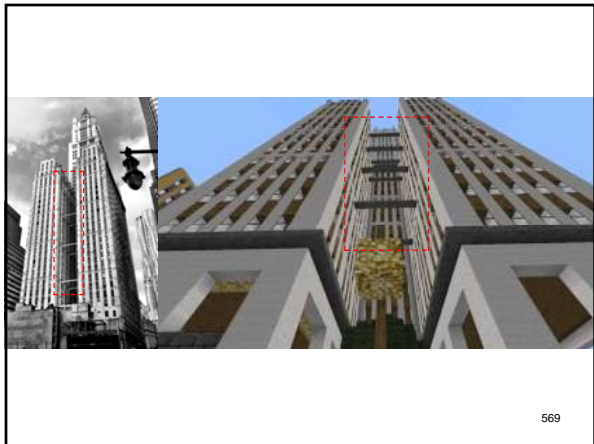
567



“...The 60-foot by 110-foot wings of the ‘U’-shaped main building are connected across the 35-foot interior court by portal struts at about every fifth storey, for the purpose of general rigidity and making the wings act as a unit in resisting wind pressure...The transverse columns in each wing are connected at each floor by double lines of continuous deep plate girders with gusset plate connections...”
 RE: excerpt from “The Master Builders”

Above & Left: view of the interior court (struts highlighted)

568



569



Left: caption: “19 Park Row – South Side.” Cross-beams (a.k.a. “Flying Beams”) create a structural “box” while still allowing for a light court. This served both the engineering and commercial needs of the building. All buildings must handle the horizontal load generated by a maximum value of wind stress, which becomes much greater as the height increases. The unsightly beams would be placed on the least visible facade, typically the rear of the building, as in the case of both the Park Row and Woolworth Building/s.

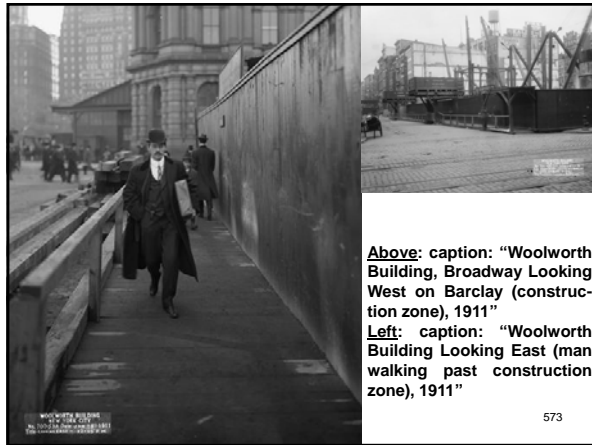
570

"...Some idea of what was required of the architect may be had from the statement that 24,000 tons of steel were used in the construction of the Woolworth Building...The building has a total weight of 206,000,000 pounds at the caissons. It is figured that the immense weight is increased, at times by wind pressure, by 40,000,000 pounds..."
 RE: excerpt from "Above the Clouds and Old New York"

571

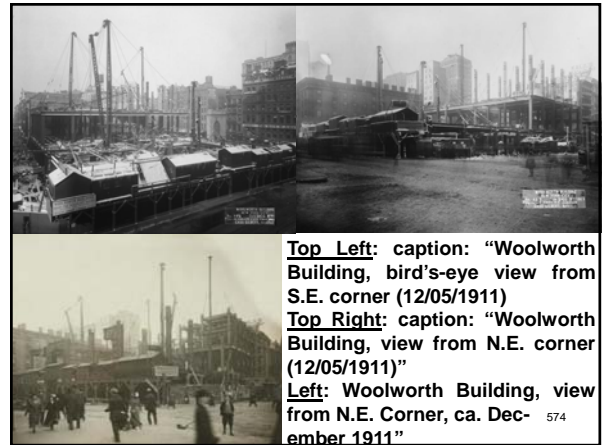
Rising

572



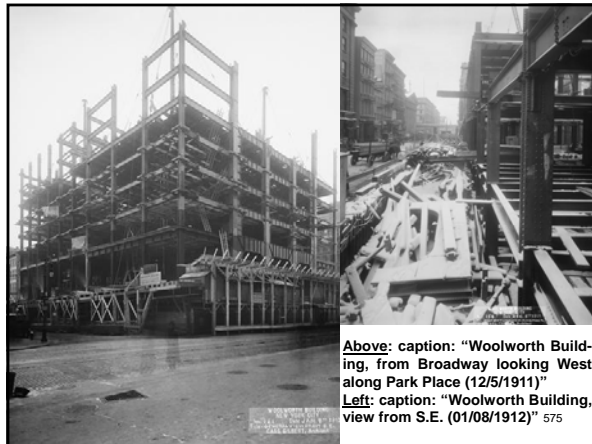
Above: caption: "Woolworth Building, Broadway Looking West on Barclay (construction zone), 1911"
Left: caption: "Woolworth Building Looking East (man walking past construction zone), 1911"

573



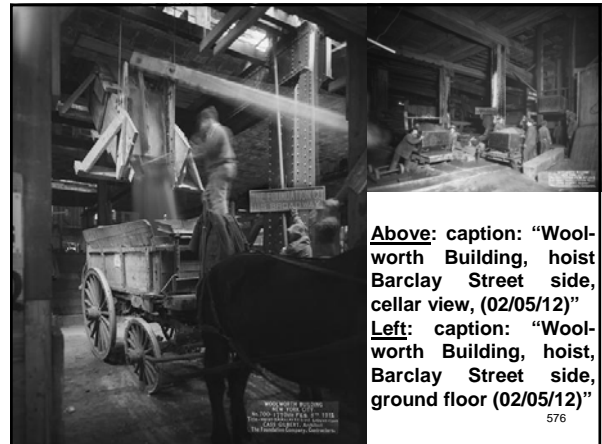
Top Left: caption: "Woolworth Building, bird's-eye view from S.E. corner (12/05/1911)"
Top Right: caption: "Woolworth Building, view from N.E. corner (12/05/1911)"
Left: Woolworth Building, view from N.E. Corner, ca. December 1911"

574



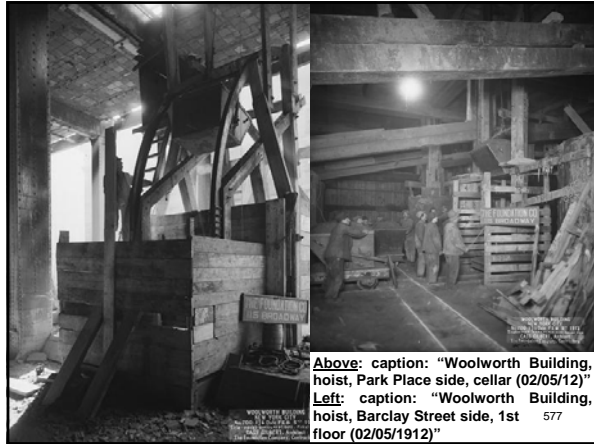
Above: caption: "Woolworth Building, from Broadway looking West along Park Place (12/5/1911)"
Left: caption: "Woolworth Building, view from S.E. (01/08/1912)"

575



Above: caption: "Woolworth Building, hoist Barclay Street side, cellar view, (02/05/12)"
Left: caption: "Woolworth Building, hoist, Barclay Street side, ground floor (02/05/12)"

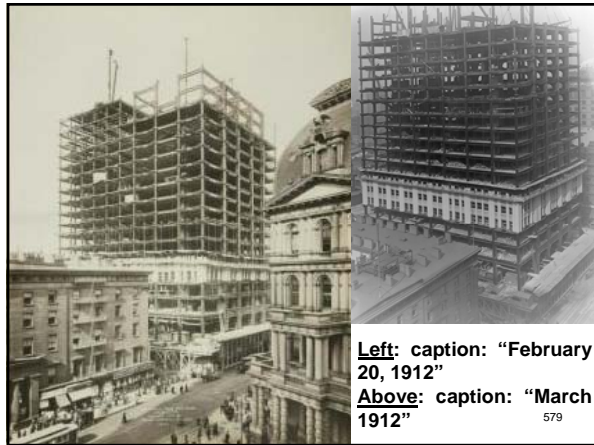
576



Above: caption: "Woolworth Building, hoist, Park Place side, cellar (02/05/12)"
Left: caption: "Woolworth Building, hoist, Barclay Street side, 1st floor (02/05/1912)" 577



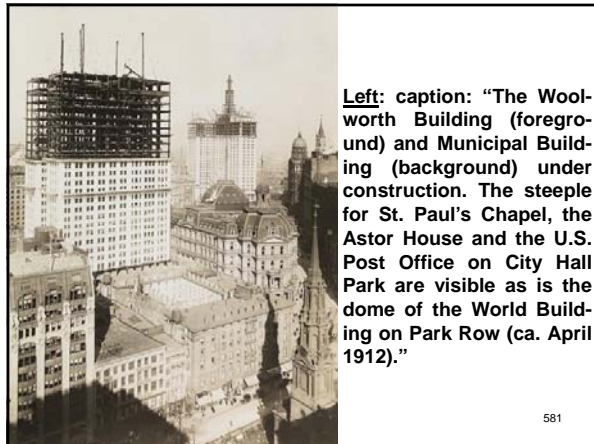
Above & Left: caption: "February 1912" 578



Left: caption: "February 20, 1912"
Above: caption: "March 1912" 579



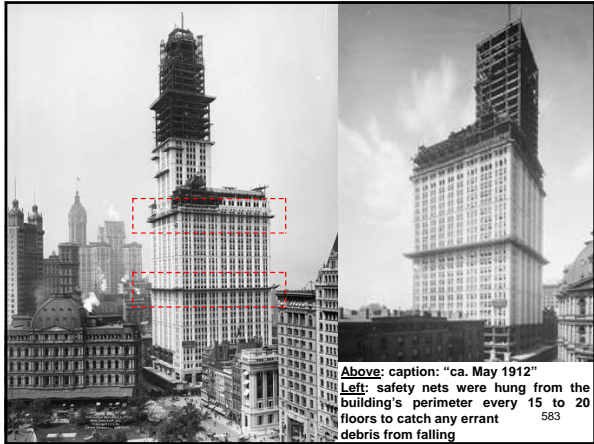
Above & Left: caption: "March 30, 1912" 580



Left: caption: "The Woolworth Building (foreground) and Municipal Building (background) under construction. The steeple for St. Paul's Chapel, the Astor House and the U.S. Post Office on City Hall Park are visible as is the dome of the World Building on Park Row (ca. April 1912)." 581

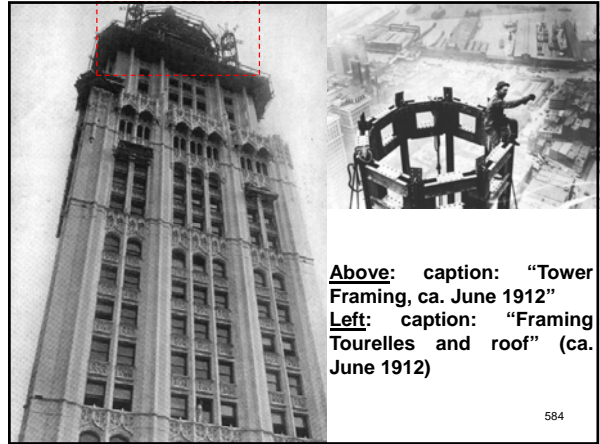


582



Above: caption: "ca. May 1912"
 Left: safety nets were hung from the building's perimeter every 15 to 20 floors to catch any errant debris from falling

583



Above: caption: "Tower Framing, ca. June 1912"
 Left: caption: "Framing Tourelles and roof" (ca. June 1912)

584



Above & Left: caption: "July 1, 1912"

585



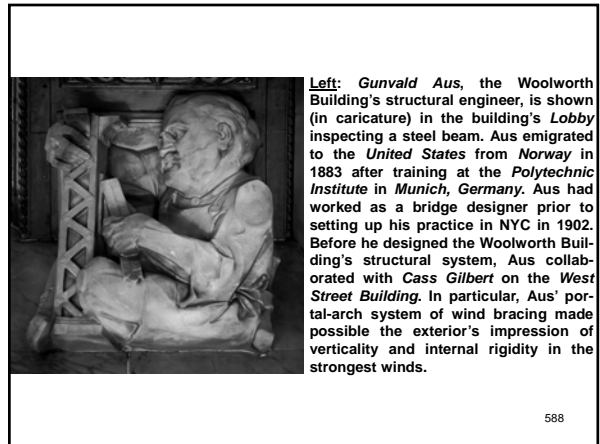
Above & Left: caption: "Woolworth Building under construction, ca. July 1912"

586



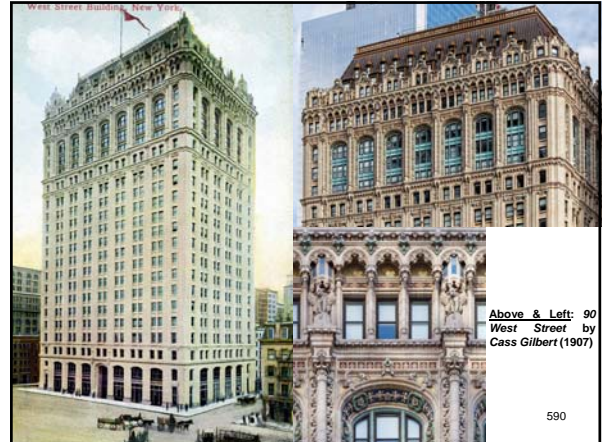
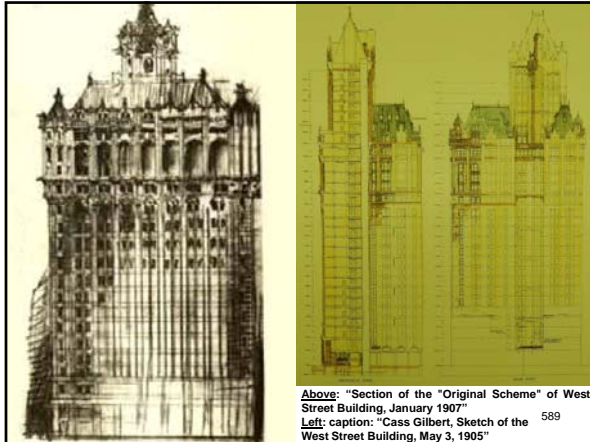
Above: caption: "Left-to-Right: September-October-November 1912"

587



Left: Gunvald Aus, the Woolworth Building's structural engineer, is shown (in caricature) in the building's Lobby inspecting a steel beam. Aus emigrated to the United States from Norway in 1883 after training at the Polytechnic Institute in Munich, Germany. Aus had worked as a bridge designer prior to setting up his practice in NYC in 1902. Before he designed the Woolworth Building's structural system, Aus collaborated with Cass Gilbert on the West Street Building. In particular, Aus' portal-arch system of wind bracing made possible the exterior's impression of verticality and internal rigidity in the strongest winds.

588



Should the Impossible Occur

"...Although the Building is fire-proof throughout, in so far as engineering masters have been able to make it, and the possibility of fire occurring within its walls is extremely remote, nevertheless, every mechanical device has been provided to safeguard the lives and property of tenants should the 'impossible' occur. A fire could not spread beyond the office in which it broke out because the walls are of stone or steel, the doors, trim, etc., also of steel, and the glass of heavy plate, wired. In fact, no inflammable material of any description was used in the construction of the Building. Every stairway is an enclosed fire-tower, and every elevator shaft is free from outside influences such as smoke, fire, heat and gases..."
 RE: excerpt from "The Cathedral of Commerce"

"...Before steel framework was seriously proposed for building construction, many other methods had been tried, but it was impossible to build 'fireproof,' in the real meaning of the word, with brick, wood, stone and cement. Buildings arose to ten, twelve and even thirteen stories, but the floors, trusses, stairs and elevator enclosures were built of iron, not only to prevent decay and burning, but because the former method of fireproof construction in partitions and floors added so greatly to the weights to be borne..."
 RE: excerpt from "The Master Builders"

Floor Construction

"...The lower floors are of concrete, twenty-four inches in thickness in the boiler and engine rooms, and twelve inches in thickness in the sub-basement laid on the surface of the ground. The floor tiles were laid on 2 by 9-inch centering planks, supported on 4 by 4-inch joists suspended by 7/8 -inch hook bolts about 4 feet apart on centers. The upper ends of the hook bolts passed through cantilever plates and took nut and washer bearings 4 by 4-inch cushion pieces on top of them. The 2 1/4 by 1/4-inch standard cantilever plates were about 10 inches long and at the anchor end were hooked over the top flanges of the floor beams, beyond the other side of which the cantilever ends projected to receive the hook bolts and were punched with two holes, spaced to clear different widths of beam flanges. The hook bolts were adjustable by their top nuts sufficiently to allow the centering planks to receive the soffit tiles below the bottom flanges of the floor beams, and then were screwed up tightly, holding the entire construction in place..."

RE: excerpt from "The Master Builders"

595

"...All the floors above the street level are of hollow tile, except two pipe gallery floors, where stone concrete slabs four inches thick, are used. The arches are the familiar type of side construction skews and keys, with end construction lengtheners. Twelve-inch arches used 12-inch I-beams, and 15-inch arches 15-inch I-beams. Where the beams are deeper than 15-inches a raised skew is used, with 12-inch arches. All girders are encased in hollow tile..."

RE: excerpt from "The Master Builders." Concrete and steel framed floors constructed in the late 1800s and early 1900s often included *Hollow Clay Tile* arches, which spanned between beams and girders. The arches were typically covered with a concrete topping and often had plaster applied directly to the underside (soffit) of the exposed tiles. Strong and stiff, the clay tiles served two purposes; transferring loads to the supporting beams and providing fire protection for the structural steel members.

596

There were two basic types of clay tile arched floor systems; segmental (left) and flat (right). Both systems were constructed using hollow clay tiles of varying sizes and shapes, with internal open cells similar to today's hollow masonry blocks. The typical web and face shell thickness was 1/2-inch and all four sides of the closed faces of the tile were also typically scored. The blocks were manufactured by a number of companies. Flat-arch tile units typically varied in depth from 6 to 16-inches. The average dead weight of these units varied from 25 to 58 pounds per square foot (psf). Segmental arch tile units were provided with radial sides so that each tile acted as a *vousoir* component of the arch. Segmental tiles typically came in 6 and 8-inch depths. Both types of arches were constructed on timber formwork platforms, which were used to secure the tiles in place during construction. The formwork was typically suspended from timber jack-beams spanning between and over the tops of the supporting steel beams. In a segmental arch, clay tiles were arranged in a shallow profile between adjacent parallel beams. The steel beams were typically held together with tie-rods (not shown in figure above), which helped to resist the outward thrust imposed by the arch on the steel beams. Solid clay bricks were also used in a similar fashion. However, hollow clay tiles typically offered an assembly that was not as heavy as solid brick. The flat clay tile arch transferred the load between the beams acting as a jack-arch with a tapered keystone located at the center of the span. As with a segmental-arch, the resulting outward horizontal thrust reaction that occurred at the beams was typically resisted via tie-rods that were required both temporarily (during construction of interior spans) and permanently (at end spans).

597

Another type of flat clay tile-arch was the reinforced system (above). For this type of "arch" system, closely spaced internal reinforcing rods were embedded between the tiles near the bottom allowing for the entire section to function more as a true flexural member rather than as an arch. This system was also referred to as the Natco "New York" reinforced flat-arch and served as the precursor to one and two-way tile joist systems.

598

Standard flat-arches can be classified into two groups: end construction and combination side and end construction. End construction consisted of laying the axis of the tiles' hollow cells parallel to the direction of the span (except at the center keystone tile). The combination side and end construction method placed the axis of the tiles' hollow cells perpendicular to the span of the arch (parallel to the supporting beam) for the majority of the blocks used in any one row. In both cases, it was normal for the depth of the tiles (in combination with the concrete topping) to be approximately the same depth as the supporting beam. This method of construction assured that the beam was completely braced for the full depth of the steel section and also made it easier to install soffit tiles beneath the beam bottom flange for fire protection. The tie-rods used to resist the arch thrust forces were generally placed approximately 3-inches from the bottom of the beams in flat arches. Typically, tie-rods were 3/4-inch in diameter and were spaced as required to resist the specific thrust of the given arch span (a minimum spacing of 15x the width or 8x the depth of the supporting steel beam was recommended). Tie-rods at an end span were required since there was no opposing thrust present at the outside face of the spandrel beam. At interior spans, with adjacent arches present on either side, tie-rods were only required during construction, but were typically left permanently in place. Flat-arch spans typically varied from 3 to 10-feet, and were capable of supporting safe uniform loads between 126 and 1,400psf.

599

A Dead Load Reduces Your Strength
Why Make a Floor Carry It?

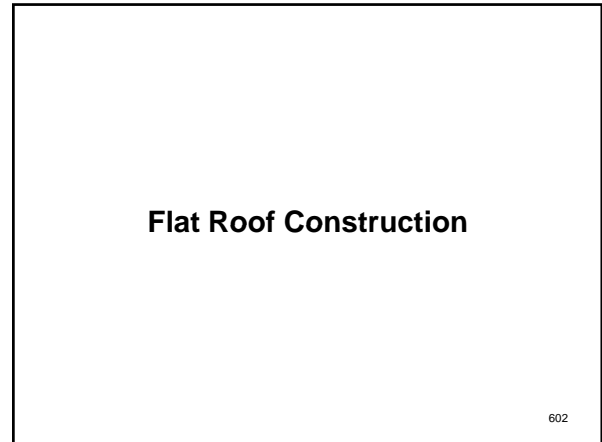
THE HOLLOW BUILDING TILE ASSOCIATION
Chicago, Ill., U.S.A.

The principal disadvantage of tile-arch floor construction was the difficulty of adapting standard sizes to irregularly shaped spaces. In addition, tile arches were more easily weakened by holes and penetrations than a monolithic floor system. Also, it was difficult to place mortar in end construction (i.e. when the open cells were placed end to end). As well, for end construction, if a single tile was removed in a row, then the remaining tiles became unsupported unless the scored sides of the tile were mortared in with the adjacent rows of tiles. Arches in which the scored sides of the tiles were placed adjacent to one another (transverse to the arch span) were more conducive to placing mortar between the tiles. This type of construction (side-constructed arches) had an advantage over end construction. However, period tests indicated that tiles were much stronger in an end construction application as opposed to a side construction configuration. Lastly, tile arch construction was susceptible to poor workmanship because the quality of the work could only be observed from the top during construction.

600



601



Flat Roof Construction

602

THE WARREN ROOFING.

WARREN'S
IMPROVED FIREPROOF AND WATERPROOF
FELT, CEMENT AND GRAVEL ROOFING

...Cyrus Warren, away back in 1845, made many experiments with coal tar and felt in his endeavor to produce a waterproof roofing. He distilled the coal tar into pitch in order to cement tarred felt together in several layers on a roof, and coated the surface with hot pitch and gravel, thereby making the first built-up roof for flat roofs, and, after two-thirds of a century. The materials have proved to be the best and most economical as a rain repellent...

RE: excerpt from "The Master Builders." In the 1840s, with westward expansion of the nation, there came a growing market for new and better roofing materials. Corrugated iron was the most promising however, a few experimenters were taking a different tack by saturating layers of felt, paper or flax with fish oil or pine tar, then covering this concoction with sand or ground shells.

603

Samuel and Cyrus Warren of Cincinnati, Ohio were two of these experimenters who revolutionized this process in 1847. From a method learned from a roofer in Newark, N.J., they found that coal tar (a waste product of the gas lighting industry) made an ideal adhesive for what we now call "built-up" roofs (the gas companies would pay to have the burdensome coal-tar waste taken away). They successfully replaced increasingly costly pine pitch with coal tar and soon the brothers had a thriving business. Their continued development of the product and expansion to other cities (i.e. Chicago, St. Louis and Philadelphia) assured the Warrens' status as leaders in the industry. In the 1850s, they were the first to distill coal tar, producing a superior refined tar. Later they found that natural asphalt from Pitch Lake in Trinidad could produce an easy-to-mix roofing pitch when combined with petroleum tar (a by-product of the oil refining process).

604

"...With the increasing scarcity of land in large cities, however, a demand came for roofing that could be walked upon and that would even withstand considerable wear and tear. Such roofs were also required to be smooth as well as hard and tough and clean. A gravel roof could not be made smooth or kept clean..."

RE: excerpt from "The Master Builders" Left: caption: "Diagram showing Barrett Specifications, Type 'AA' Roof over Boards - Bonded for 20 years"

605

"...but the coal-tar saturated felt and coal tar pitch roofing, protected with vitrified tiles laid in Portland cement, is both hard and smooth and durable, and can be kept scrupulously clean at all times..."

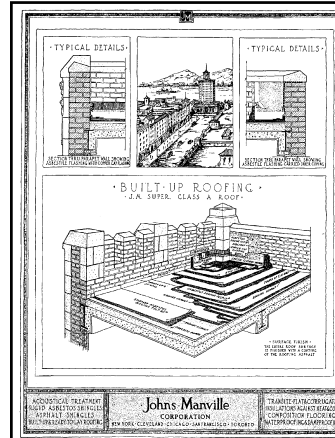
RE: excerpt from "The Master Builders" Above: caption: "Waterproof Roofing"

606

“...A record of seventy years has proved that coal-tar-saturated felt and coal tar pitch waterproofing, when protected with vitrified tiles or bricks, makes the only genuine waterproof flat roof. This is the roofing which covers the flat top of the Woolworth Building. The vitrified tiles are laid in Portland cement...Tobias New patented the basic features of the ‘T New Tile Roof,’ which is the name of the roofing described, and worked with Lewis W. Harrington, until his death in 1902, in endeavoring to bring the roofing to perfection. And Mr. Harrington, of the T New Construction Company, has gone along in his footsteps, improving on the old ideas until he has produced the roofing which was selected for the protection of the flat roof of the Woolworth Building...The architects and contractors are satisfied that the work was well done, and there is every possibility of the roof outlasting the structure...”

RE: excerpt from “The Master Builders”

607



Left: the specification for the built-up roof in this 1929 Johns-Manville advertisement called for it to be: “Applied only by the manufacturer or by approved roofing contractors.” The materials consisted of asphalt-impregnated asbestos-based roofing felt and asphalt-based roofing cement. It added that: “No slag or gravel is ever used or needed on a Johns-Manville Roof.”

608

WOOLWORTH prefers to ROOF according to the BARRETT SPECIFICATION

The advertisement features several images of the Woolworth Building. The main headline reads 'WOOLWORTH prefers to ROOF according to the BARRETT SPECIFICATION'. Below this, there is a sub-headline: 'The same ROOF the same SERVICE in metropolis or province'. The text describes the benefits of the Barrett Specification Roof, including its durability and fireproofing capabilities. At the bottom, there is a logo for 'Barrett Specification Roofs'.

Left: caption: “WOOLWORTH prefers to ROOF according to BARRETT SPECIFICATIONS.” This is one of a barrage of press advertisements that accompanied the opening of the Woolworth Building in April 1913. FW’s well-oiled publicity machine arranged the advertising tie-ins, allowing his personal endorsement only when the vendor (in this case the roofing contractor) gave him a special discount.

609

Most Satisfactory

610

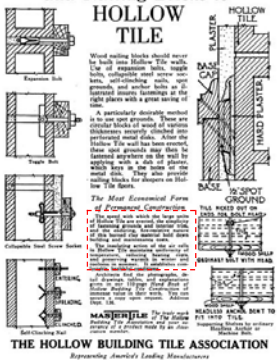
“...The contractor had the option of fireproofing the columns with stone concrete or with hollow tile with cement mortar poured in to fill the space between the blocks and the steel work, but concluded that hollow tile would be most satisfactory. The columns in the lower stories were fireproofed with stone concrete. On account of the obstruction caused by numerous pipes, it was found difficult to continue this method, so recourse was had to the ‘cement gun,’ which proved so satisfactory that its use was approved and all the columns and wind bracing in the upper stories were encased in mortar thrown on by the ‘gun.’ Thus the steel is protected from corrosion by the Atlantic Portland cement mortar, and the whole construction from fire by blocks. All partitions are of four-inch and six-inch hollow tile. All wall furring is two-inch and three-inch hollow tile. The following are the approximate quantities of hollow tile used in the building; 750,000 square feet floor and roof arches, 200,000 square feet girder covering and 1,500,000 square feet partitions and furring, or a total of 28,000 tons...”

RE: excerpt from “The Master Builders”

611

Comfortable, Healthful Conditions

612



Fastening Furring, Grounds and Nailing Blocks to HOLLOW TILE

Wood nailing blocks should never be built into hollow tile walls. Use of expansion bolts, toggle bolts, cotter pins, screw anchors, grounds and nailing blocks as illustrated insure fastening at the right places with a great saving of time.

A permanent concrete wall is to use spot grounds. These are circular blocks of wood of various thicknesses, usually finished with galvanized iron. When set in place, these spot grounds may then be removed and the wall be finished with a regular masonry block. They also serve as nailing blocks for anchors in hollow tile walls.

The Most Economical Form of Permanent Construction


THIS WALL SET ON INSULATED SPOT GROUND

INSURE SET WITH HEAD

THE HOLLOW BUILDING TILE ASSOCIATION
Representing America's Leading Manufacturers
CONWAY BUILDING - CHICAGO

Left: caption: "...The speed with which the large units of Hollow Tile are erected, the simplicity of fastening grounds and interior trim. And the enduring, fire-resistive nature of this burned clay material hold down building and maintenance costs. The insulating action of the air cells in Hollow Tile maintains uniformity of temperature, reducing heating costs, and preserving warmth in winter and coolness in summer. It establishes comfortable, healthful conditions..."

613



"Back of Every NATCO Home You Build"

FOR over thirty years NATCO HOLLOW TILE has been used in the construction of apartments, industrial buildings, all kinds of big projects, hospitals, schools, etc. The modern large NATCO HOLLOW TILE is being used more and more every year.

These buildings stand firm and strong because of NATCO HOLLOW TILE. The value of NATCO HOLLOW TILE is that it is made of burned clay, is fireproof and fire-resistive, and is strong and durable. It is made of a material that is not affected by acids, alkalis, or salts. It is also fireproof and fire-resistive.

NATCO HOLLOW TILE

NATIONAL FIRE PROOFING COMPANY
381 Federal Street Pittsburgh, Pa.

NATCO HOLLOW TILE

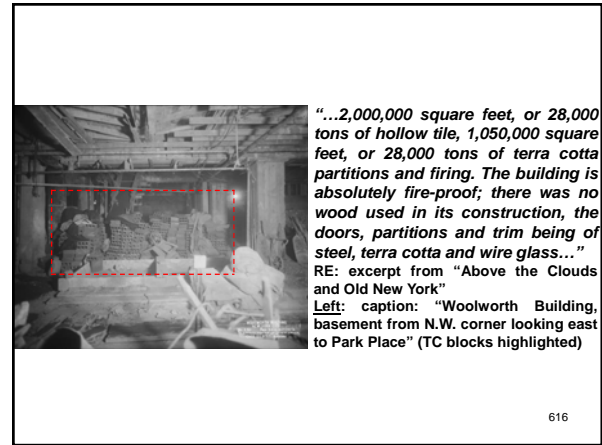
Left: an advertisement for Natco Hollow Tile ca. 1920 (note the Woolworth Building in the ad - highlighted at upper left)

Introduced to North America in 1875, Structural Clay Tile (a.k.a. Structural Terra Cotta, Building Tile, Hollow Tile and/or Clay Block) is an extruded clay shape that allows it to be laid in the same manner as other types of masonry. Used to construct the walls of buildings and in structural fireproofing, it was chiefly used during the late 19th and early 20th Century/s to build fire-resistant walls and partitions in North America (it continues to be used in Europe). Typically, units having a ribbed surface were covered with plaster as a finish (smooth-face units were also available). Non-bearing units used for interior partitions could be laid with cell oriented horizontally or vertically. Special shapes were available to attach to and fit around structural steel shapes, providing a fire-resistant enclosure for load-bearing steel members (i.e. columns). Lightweight, cost-effective and fire-resistant, the system was used widely in steel-framed buildings.

614



615

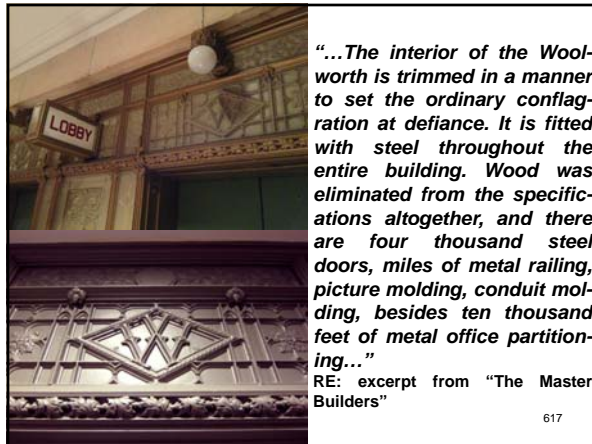


"...2,000,000 square feet, or 28,000 tons of hollow tile, 1,050,000 square feet, or 28,000 tons of terra cotta partitions and firing. The building is absolutely fire-proof; there was no wood used in its construction, the doors, partitions and trim being of steel, terra cotta and wire glass..."

RE: excerpt from "Above the Clouds and Old New York"

Left: caption: "Woolworth Building, basement from N.W. corner looking east to Park Place" (TC blocks highlighted)

616



"...The interior of the Woolworth is trimmed in a manner to set the ordinary conflagration at defiance. It is fitted with steel throughout the entire building. Wood was eliminated from the specifications altogether, and there are four thousand steel doors, miles of metal railing, picture molding, conduit molding, besides ten thousand feet of metal office partitioning..."

RE: excerpt from "The Master Builders"

617

"...Wire glass is used to protect those places which are exposed to fire risk from adjoining buildings, but everywhere else are bronze-covered window frames and sashes with hollow steel trim - 3,500 altogether. The elevator openings are enclosed in fireproof shafts, and all elevator doors are of iron, except those on the first story, which are of polished and engraved steel. There are four stairways within the main building and two in the tower. These are enclosed with terra cotta partitions and are shut off from the public corridors by hollow steel doors. A fire escape is located at the end of the court and approached from the main corridor on each story..."

RE: excerpt from "The Master Builders"

618



Top Left: caption: "Scandinavian Trust Co., Woolworth Building, director's room, ca. 1917"

Top Right: caption: "Philippine National Bank in the Woolworth Building. Officer's quarters, ca. 1917"

Left: caption: "Monroe Calculating Machine Co., Woolworth Building, ca. 1921" 619



"...The United States Metal Products Company executed the contract for the interior metal work very satisfactorily, furnishing more than 1,500 bronze-covered frames and sash and hollow steel molding, 3,000 hollow steel doors, interior partition frames and sash, besides numerous other metal fire-proof devices. All this material is finished in mahogany..."

RE: excerpt from "The Master Builders"
Top: caption: "Bronze Covered Frames and Sashes"



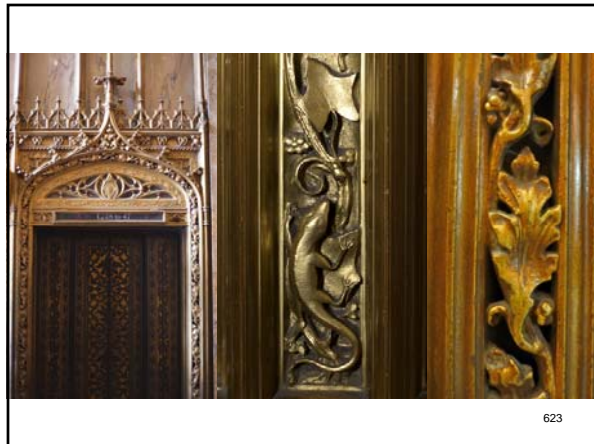
Bottom: caption: "Woolworth Building. Corridor on 24th Floor, Woolworth offices." 620

Realizing the Grandeur

621

"...Old things have all passed away and all things have become new. Daily are we reminded of the ideals of a century ago, or half a century ago, or perhaps only a quarter of a century, and the comparison with what we see around us today is at first startling, then when we realize the grandeur of invention and cultivation which is unostentatiously demonstrated in the marvelous advance we are delighted to realize that we are living in an age of scientific progress and consequent intelligence. The development of electricity, wire and wireless, and building construction, with the equal development of accessories, appliances and minor details during the past twenty-five years alone, is sufficient to thrill the hearts of all the rising generation as well as those who have outlived their little span of life, but have lived to see the marvels of the twentieth century..."

RE: excerpt from "The Master Builders" 622



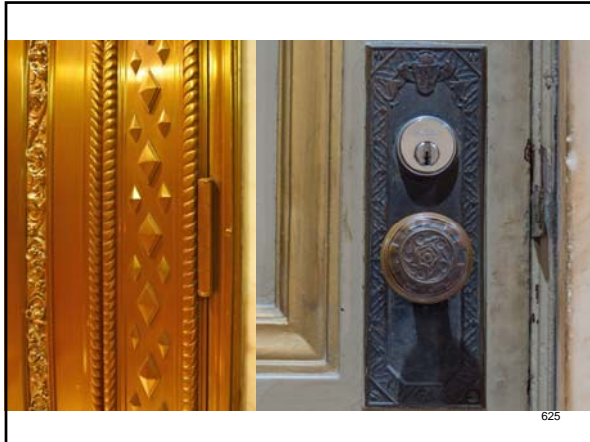
623



Top Left: caption: "Matching pair of ornamental cast bronze monogrammed Woolworth Building doorknob backplate"

Top Right: caption: "Pair of ornamental cast bronze Woolworth Building interior passage doorknobs"

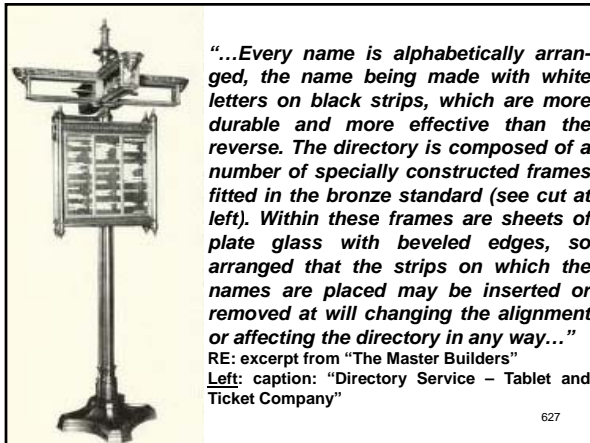
Left: caption: "Ornamental bronze-plated reclining erotic female Woolworth Building souvenir or advertising piece" 624



625

"...It is small wonder that the old 'name-board' which was an 'eyesore' in the old style office buildings has been replaced by 'directories' artistically framed in iron frames, designed and bronzed in harmony with the building. The Wilson Directory System for tenants, installed by the Tablet and Ticket Company of New York, was just the one thing needed to complete the most conspicuous building in the city. Not alone is it admirable for its compactness, utility and beauty, but because it can be easily controlled with unfailing regularity. The day the tenant signs the lease the name is recorded in the directory and desired changes are made immediately and notice has been given to the superintendent of the building or one of his assistants..."
 RE: excerpt from "The Master Builders"

626



"...Every name is alphabetically arranged, the name being made with white letters on black strips, which are more durable and more effective than the reverse. The directory is composed of a number of specially constructed frames fitted in the bronze standard (see cut at left). Within these frames are sheets of plate glass with beveled edges, so arranged that the strips on which the names are placed may be inserted or removed at will changing the alignment or affecting the directory in any way..."

RE: excerpt from "The Master Builders"
 Left: caption: "Directory Service - Tablet and Ticket Company"

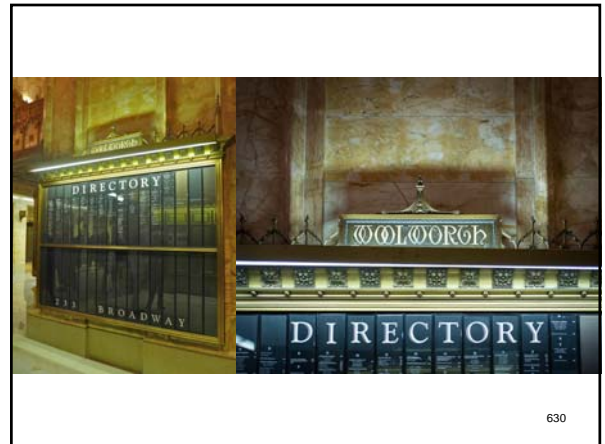
627



Above & Left: caption: "Woolworth Building Directory"
 628



629



630

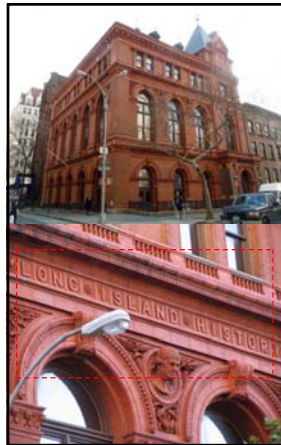
Part 7

North, South, East & West

631

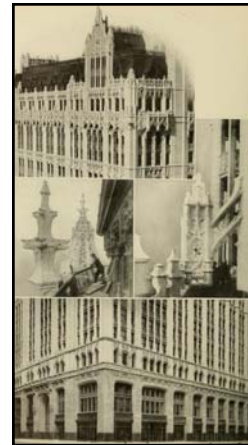
Hardly a Generation Old

632




"...The introduction into general use in this country of terra cotta as a decorative material is hardly more than a generation old. One of the lessons of the Chicago fire of 1871, reinforced by the Boston fire of the following year was, as everybody interested in the subject knows, that unprotected metal supports could not be trusted to maintain their shape, nor their supporting power, in the heat of a fierce conflagration. Soon after the fires in question, experiments began in adjusting to the supports protective envelopes of baked clay. The use of terra cotta thus began, was extended by the establishment of one or two firms which made a specialty of terra cotta cornices, as a cheaper substitute for stone, as a more efficient and durable substitute for sheet metal..."

Montgomery Schuyler, Architectural Critic
 RE: in 1878, architect George B. Post incorporated terra cotta into his design for the Long Island Historical Society headquarters at Pierpont and Clinton Street's in Brooklyn Heights (left T&B) 633



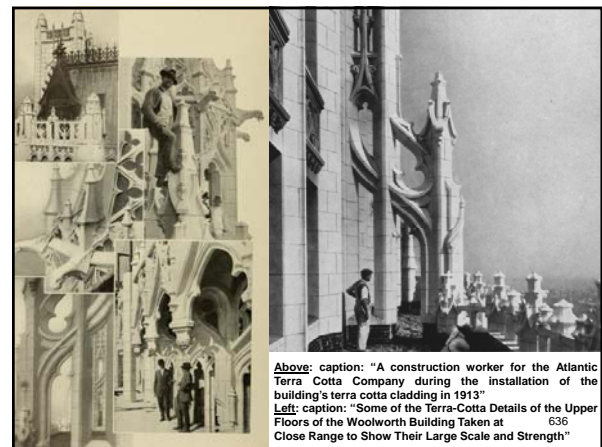
"...The entire visible facades of the Woolworth Building are made strong and beautiful with terra cotta. From the third story to a height of eight hundred and seventy-seven feet, viewed from the north, the south, the east and the west, the rich Gothic designs are plainly to be seen and admired, marking every window and each story by the sharp outlines and exquisite figures, curves and scrolls..."

RE: excerpt from "The Master Builders"
 Left: caption: "Some of the Exterior Architectural Details of the Woolworth Building" 634



"...This was by no means the first experiment in the decorative use of terra cotta. Long before the great fires mentioned, in the sixties, even in the fifties, terra cotta had been decoratively employed. It was employed in the old Trinity Building, designed by the elder Upjohn and facing Trinity Churchyard in New York. It was so employed at about the same time or perhaps even earlier, in the cornice of the 'Tontine Coffee House,' near the foot of Wall Street, designed by Renwick. But these experiments remained fruitless..."

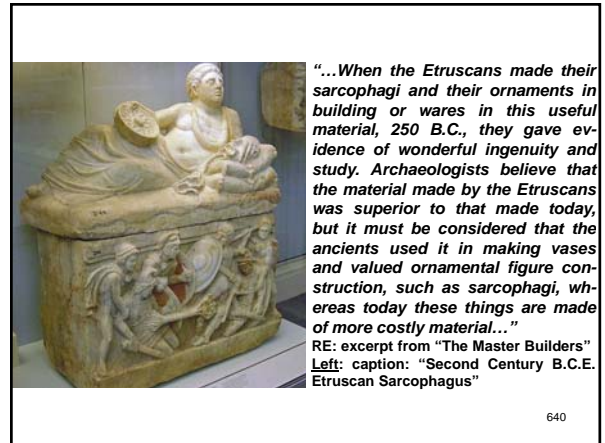
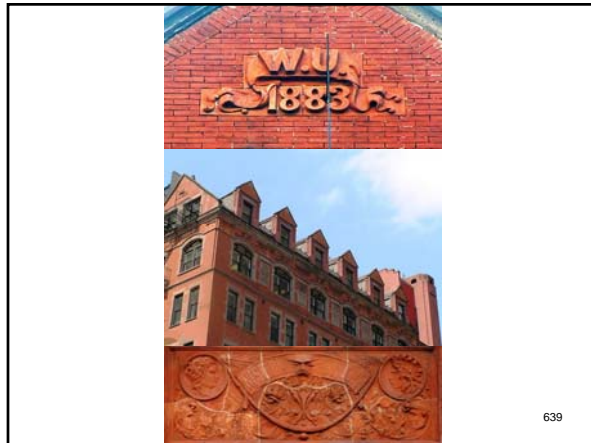
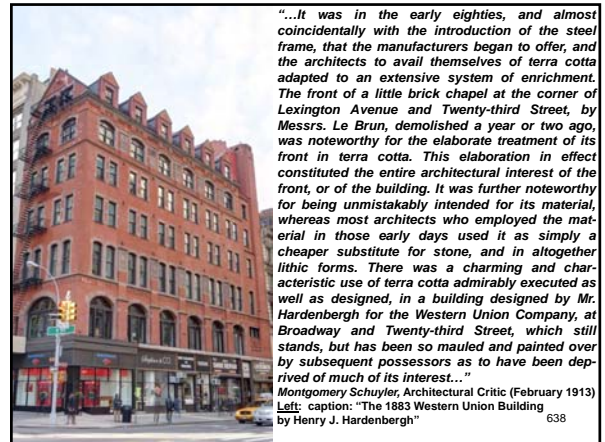
Montgomery Schuyler, Architectural Critic
 Left: caption: "Trinity Building, NY (1905 postcard)" 635



Above: caption: "A construction worker for the Atlantic Terra Cotta Company during the installation of the building's terra cotta cladding in 1913"
 Left: caption: "Some of the Terra-Cotta Details of the Upper Floors of the Woolworth Building Taken at Close Range to Show Their Large Scale and Strength" 636

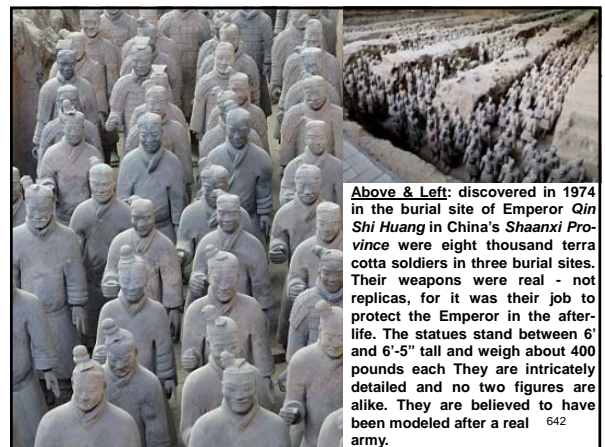
An Extensive System of Enrichment

637



Feet of Clay

641





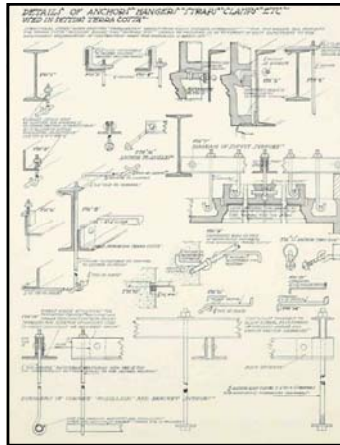
"...The terra cotta of today is a plaster mixture of clay and other substances which can be molded by hand or machine, perhaps, to architectural forms and baked to a hardness and toughness useful in building construction. It is somewhat less costly than carved stone, and allows greater scope in design, besides being lighter and more suitable for lofty buildings, especially towers..."

RE: excerpt from "The Master Builders"

Left: the New York Architectural Terra-Cotta Works built a new factory and office in Long Island City in 1892. The company supplied architectural terra-cotta for many noteworthy projects of the era including Carnegie Hall, the Ansonia Hotel and many others. The company went out-of-business in the 1930s.

Imperatively Indicated

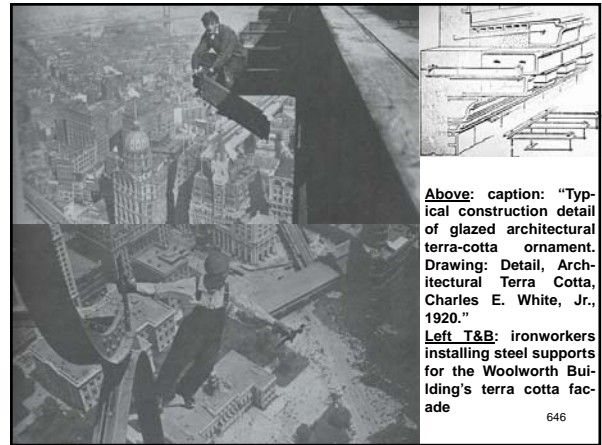
644



"...When the steel frame came in, the use of terra cotta instead of stone as the main material of the exterior as well as of the interior was imperatively indicated, not only by the cheapness of the material in the comparison, but by its superior adaptability to the expression of the construction..."

Montgomery Schuyler, Architectural Critic

Left: caption: "Terra Cotta Standard Construction - National Terra Cotta Society. Plate No. 67: Details of anchors, hangers, straps, clamps etc. used in setting Terra Cotta."



Above: caption: "Typical construction detail of glazed architectural terra-cotta ornament. Drawing: Detail, Architectural Terra Cotta, Charles E. White, Jr., 1920."

Left T&B: ironworkers installing steel supports for the Woolworth Building's terra cotta facade

646

If He Be an Artist

647



"...The use of color to enhance the shadows and to accent the main lines of the structure is an important element in the design of the Woolworth Building and very little notice has been taken of it, but if color were not there the design would be far less effective...It was at least an honest endeavor to express in exterior form the function of the building and the fact that it was a steel structure, not a masonry structure...color may be invoked to aid in the desperate need of thickness by an architect if he be an artist, and knows that it is not used for itself in this emergency, but for the effect it may produce in emphasizing form..."

Cass Gilbert, Architect

648



"...The prevailing color of the terra cotta on the Woolworth Building is a delicate buff, varying slightly in tone, and whenever a modeled design is in evidence it is thrown into relief more strongly by soft shades of blue, green or yellow..."

RE: excerpt from "The Master Builders." Terra cotta made possible the mass-production of ornament for the nearly 400K similar units of terra cotta cladding and for the decorative spandrel panels (under/over the windows). Eight spandrel motifs were repeated in different combinations across the building's four main facades.

649



The production of the terra cotta incorporated the application of colored glazes; one of the most important features of the Woolworth Building's aesthetic design. By using light and dark blues, yellows and greens to accentuate depth and shadow in the facade's extensive Gothic ornament Gilbert, in effect, added another dimension to the tower and base. The master architect aspired to enhance the beauty of the skyline in both near and distant views of the building.

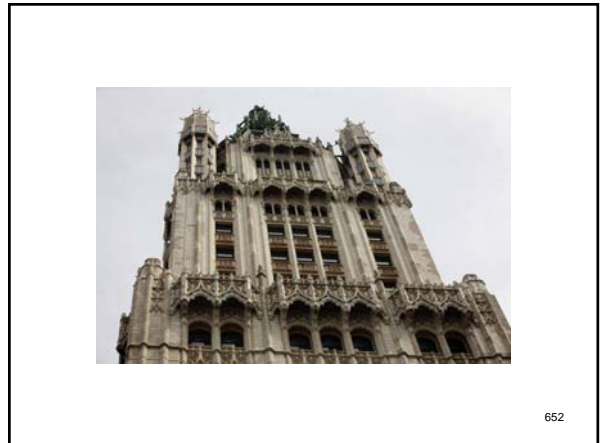
650



"...increase the height of the tower and relate it to the color of the sky, whether blue or gray..."

Cass Gilbert, Architect

651



652

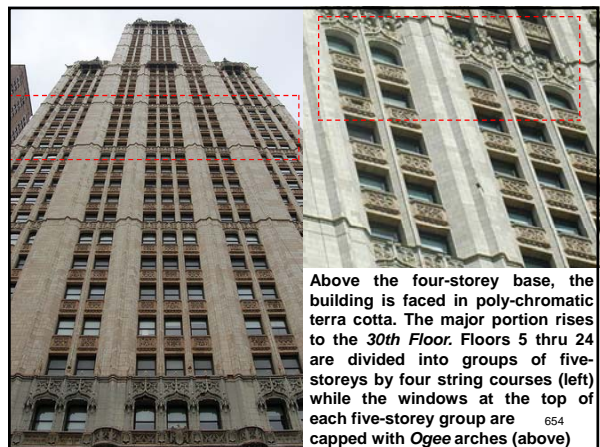


"...The color is light cream, smooth in texture, warm and varying slightly in tone. Wherever modeled design occurs the ornament is accentuated by a background in soft faience, blue, golden, yellow or green..."

Cass Gilbert, Architect

RE: the verticality of the tower is expressed not only through its Gothic-style vertical elements, but also by the grouping of windows in unbroken rows, separated by terra cotta spandrel panels and set-off from one another horizontally by projecting piers

653



Above the four-storey base, the building is faced in poly-chromatic terra cotta. The major portion rises to the 30th Floor. Floors 5 thru 24 are divided into groups of five-stories by four string courses (left) while the windows at the top of each five-storey group are capped with Ogee arches (above)

654



Each window is separated from the window above and/or below by a terra cotta spandrel adorned with Gothic tracery. The decorative design of the spandrel is different under each of the five windows with the pattern repeating itself in each set of five storeys. Within paired window bays, each set of five spandrels has the same five ornamental patterns, but set in a different order to provide contrast.

655



656



Horizontally, the columns of windows are divided into bays by continuous angled vertical piers and separated from each other by smaller, similar piers. On the *Broadway* elevation the grouping (from south-to-north) is: 4-2-3-2-4 (the outer four-window bays include two half-size windows at either end thus, they are equal in width to a three-window bay). On the *Barclay Street* elevation (from east-to-west) the grouping of window bays is: 3-3-3-2-2-2-2-2-2 and on *Park Place* the grouping is: 3-4-3-2-2-2 (the first and third bay/s from the east on both side elevations include two half-size windows akin to the *Broadway* elevation).

657

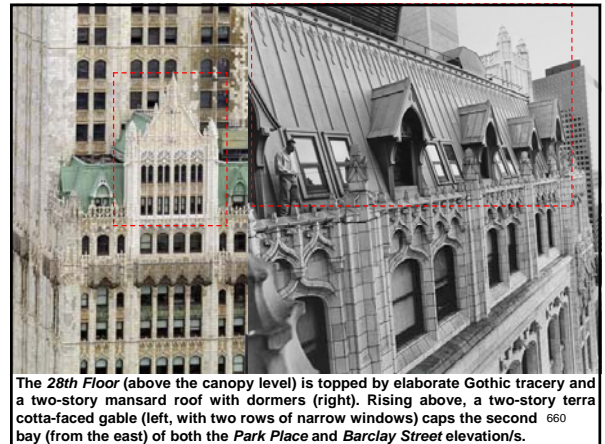


658



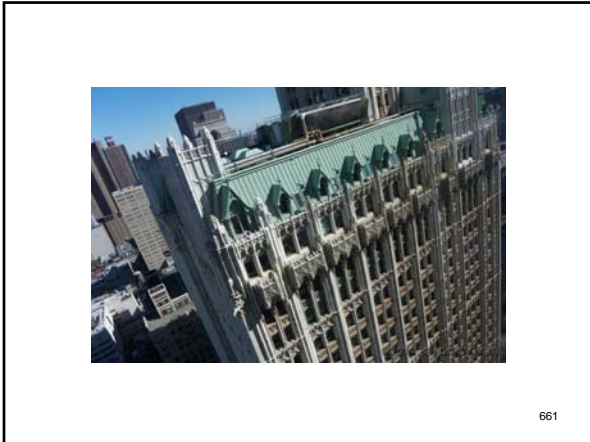
Above the fourth string course (below the *25th Floor*) are two additional stories of windows and spandrels. The uppermost windows are capped by projecting terra cotta *Ogee* arches which function as a canopy and occupy the *27th Floor*. The *Ogee* arches have rib vaults in their *Intra-dos*.

659

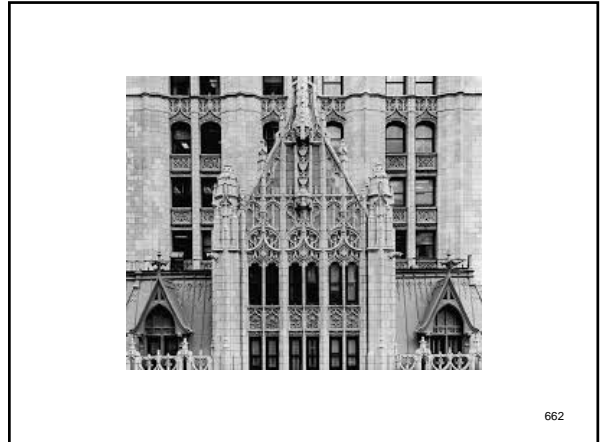


The *28th Floor* (above the canopy level) is topped by elaborate Gothic tracery and a two-story mansard roof with dormers (right). Rising above, a two-story terra cotta-faced gable (left, with two rows of narrow windows) caps the second bay (from the east) of both the *Park Place* and *Barclay Street* elevation/s.

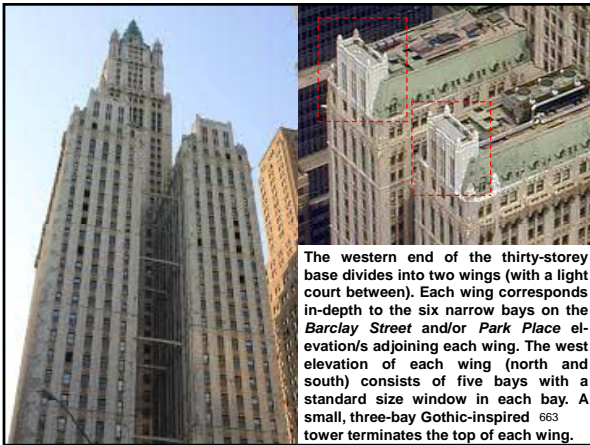
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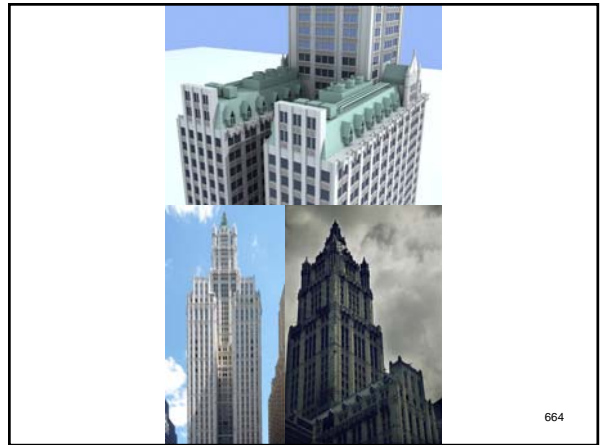
661



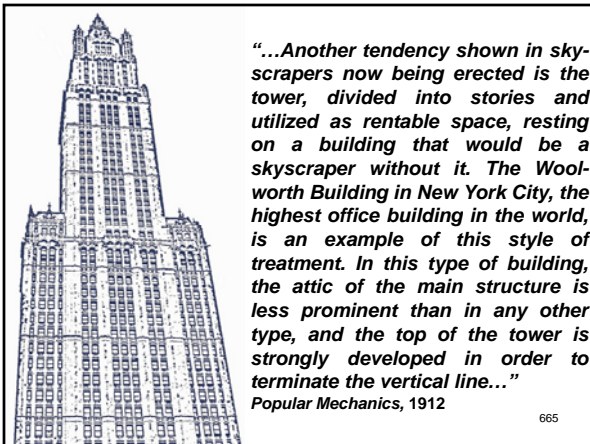
662



The western end of the thirty-storey base divides into two wings (with a light court between). Each wing corresponds in-depth to the six narrow bays on the Barclay Street and/or Park Place elevation/s adjoining each wing. The west elevation of each wing (north and south) consists of five bays with a standard size window in each bay. A small, three-bay Gothic-inspired tower terminates the top of each wing. ⁶⁶³

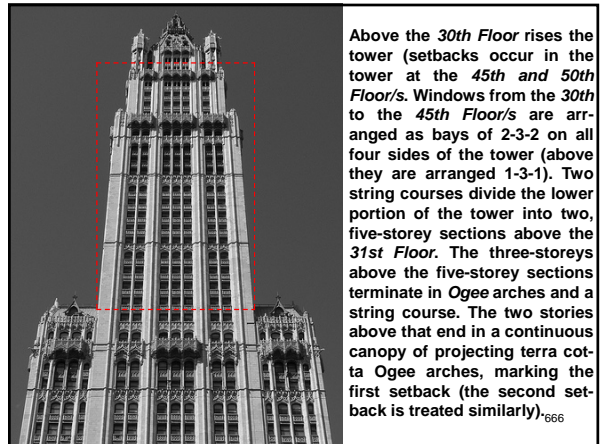


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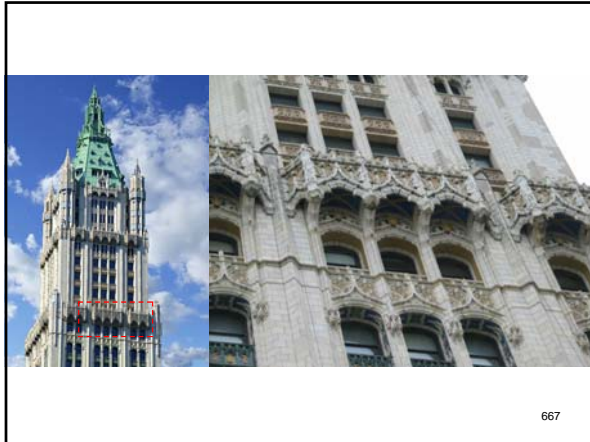


"...Another tendency shown in skyscrapers now being erected is the tower, divided into stories and utilized as rentable space, resting on a building that would be a skyscraper without it. The Woolworth Building in New York City, the highest office building in the world, is an example of this style of treatment. In this type of building, the attic of the main structure is less prominent than in any other type, and the top of the tower is strongly developed in order to terminate the vertical line..."
Popular Mechanics, 1912

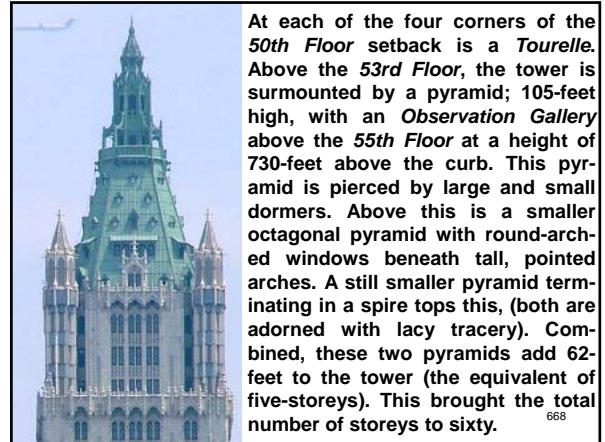
665



Above the 30th Floor rises the tower (setbacks occur in the tower at the 45th and 50th Floor/s. Windows from the 30th to the 45th Floor/s are arranged as bays of 2-3-2 on all four sides of the tower (above they are arranged 1-3-1). Two string courses divide the lower portion of the tower into two, five-storey sections above the 31st Floor. The three-storeys above the five-storey sections terminate in Ogee arches and a string course. The two stories above that end in a continuous canopy of projecting terra cotta Ogee arches, marking the first setback (the second setback is treated similarly).⁶⁶⁶

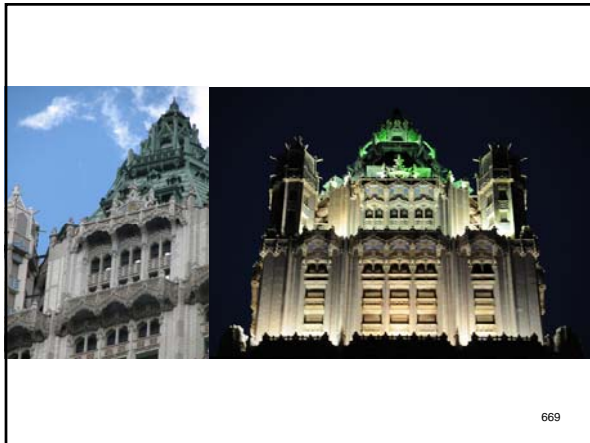


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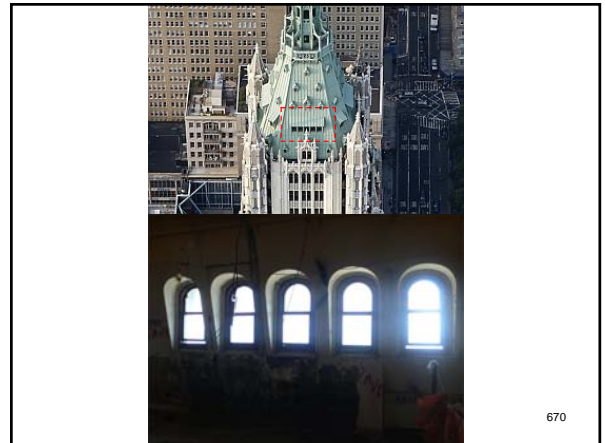


At each of the four corners of the 50th Floor setback is a *Tourelle*. Above the 53rd Floor, the tower is surmounted by a pyramid; 105-feet high, with an *Observation Gallery* above the 55th Floor at a height of 730-feet above the curb. This pyramid is pierced by large and small dormers. Above this is a smaller octagonal pyramid with round-arched windows beneath tall, pointed arches. A still smaller pyramid terminating in a spire tops this, (both are adorned with lacy tracery). Combined, these two pyramids add 62-feet to the tower (the equivalent of five-storeys). This brought the total number of storeys to sixty.

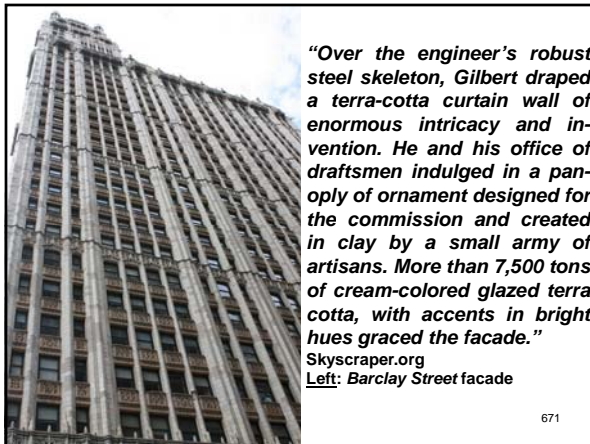
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669



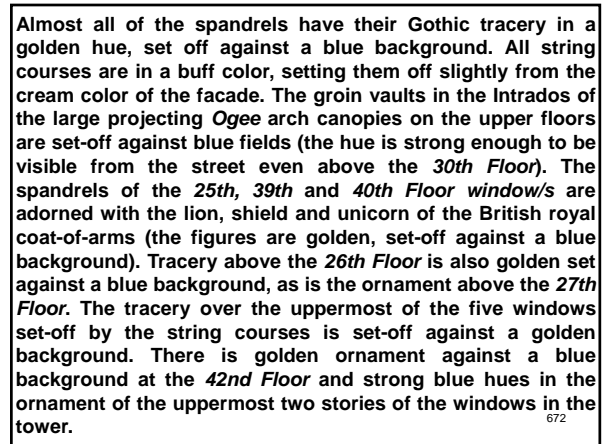
670



“Over the engineer’s robust steel skeleton, Gilbert draped a terra-cotta curtain wall of enormous intricacy and invention. He and his office of draftsmen indulged in a panoply of ornament designed for the commission and created in clay by a small army of artisans. More than 7,500 tons of cream-colored glazed terra cotta, with accents in bright hues graced the facade.”

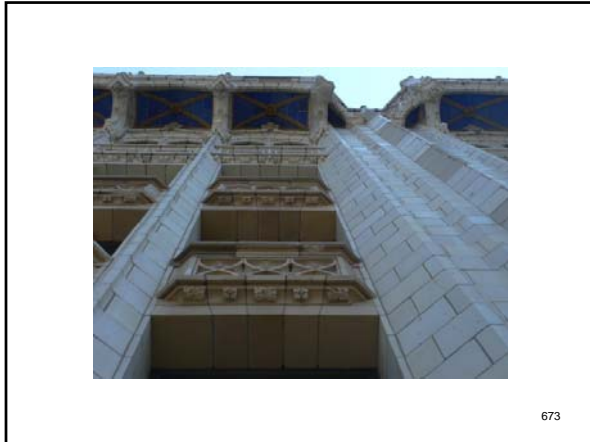
Skyscraper.org
Left: Barclay Street facade

671

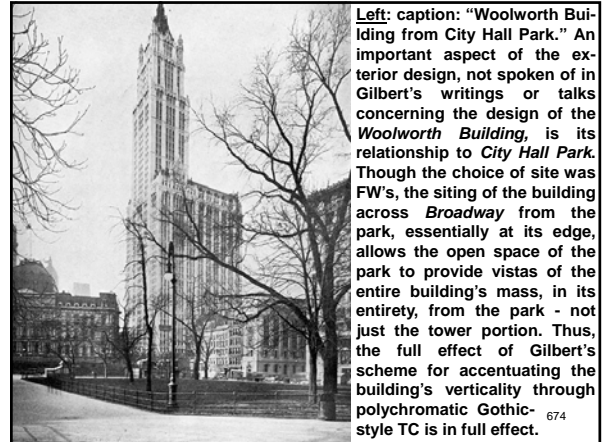


Almost all of the spandrels have their Gothic tracery in a golden hue, set off against a blue background. All string courses are in a buff color, setting them off slightly from the cream color of the facade. The groin vaults in the Intrados of the large projecting Ogee arch canopies on the upper floors are set-off against blue fields (the hue is strong enough to be visible from the street even above the 30th Floor). The spandrels of the 25th, 39th and 40th Floor window/s are adorned with the lion, shield and unicorn of the British royal coat-of-arms (the figures are golden, set-off against a blue background). Tracery above the 26th Floor is also golden set against a blue background, as is the ornament above the 27th Floor. The tracery over the uppermost of the five windows set-off by the string courses is set-off against a golden background. There is golden ornament against a blue background at the 42nd Floor and strong blue hues in the ornament of the uppermost two stories of the windows in the tower.

672



673



Left: caption: "Woolworth Building from City Hall Park." An important aspect of the exterior design, not spoken of in Gilbert's writings or talks concerning the design of the *Woolworth Building*, is its relationship to *City Hall Park*. Though the choice of site was FW's, the siting of the building across *Broadway* from the park, essentially at its edge, allows the open space of the park to provide vistas of the entire building's mass, in its entirety, from the park - not just the tower portion. Thus, the full effect of Gilbert's scheme for accentuating the building's verticality through polychromatic Gothic-style TC is in full effect.

674



675



676

Length, Breadth and Thickness

677

"...we have endeavored to 'express' the plan and to so design it that it will be frankly a masonry and terra cotta covering of a steel frame instead of pretending to be a masonry building. There are three elements that are commonly counted upon for architectural expression - length, breadth and thickness. In a business building we may have length and breadth, but our wall surfaces cannot have thickness. In short, we cannot waste space for arches or colonnades or other architectural features, without sacrificing the rentable area, and we cannot project beyond the property line, therefore we have to deal with a perfectly flat surface without 'relief' which would give light and shade. We also have to provide windows at frequent and regular intervals both horizontal and vertical. It is these conditions that make the skyscraper problem so difficult of solution. I have endeavored to meet them by the use of detail in the treatment of wall surface and by the careful adjustment of polychromatic decoration..."

Cass Gilbert, Architect

RE: excerpts from a 1912 speech concerning the architectural design of the *Woolworth Building*. Gilbert's approach to skyscraper design was based on structural expression and aesthetic treatment of materials. Since commercial buildings require thin surfaces on their exterior walls, he believed these thin surfaces should be treated decoratively and be expressive of the steel structure that supports it. To this end, one of the prime devices he used was color.

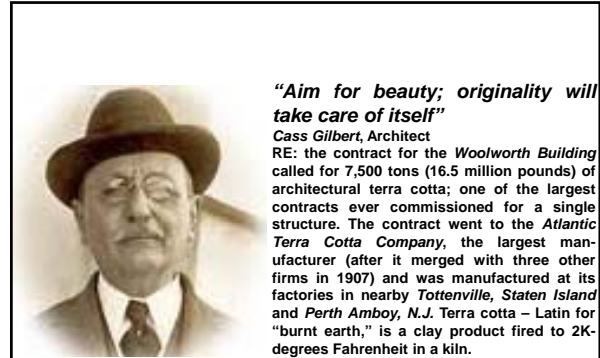
678



Left: caption: "Detail of Windows at the 47th Floor, the Woolworth Building, New York City"

Middle: caption: "Window jamb at 46th story. Six colors appear in this detail. Notice the new Municipal Building in the background."

Right: present-day (color) view of terra cotta window jamb/head 679



"Aim for beauty; originality will take care of itself"

Cass Gilbert, Architect

RE: the contract for the *Woolworth Building* called for 7,500 tons (16.5 million pounds) of architectural terra cotta; one of the largest contracts ever commissioned for a single structure. The contract went to the *Atlantic Terra Cotta Company*, the largest manufacturer (after it merged with three other firms in 1907) and was manufactured at its factories in nearby *Tottenville, Staten Island* and *Perth Amboy, N.J.* Terra cotta – Latin for "burnt earth," is a clay product fired to 2K-degrees Fahrenheit in a kiln.

680



"...The carving and modeling are usually entrusted to the contractor for stone, marble or terra cotta, who in turn gives the work to the lowest bidder. This lack of system often results in inferior work, which is traceable in many pretentious buildings. In the Woolworth Building, however, wisdom predominated and the architect made the selection of the men who should do the carving and modeling. It was a matter of importance that the artistic effect of the entire construction should be maintained in every detail. Kohn Donnelly and Eliseo V. Ricci were awarded this important contract. They executed the carving with wonderful skill and made the models for everything which had to be specially designed and made, from the door knobs to the finial on the tower..."

RE: excerpt from "The Master Builders"

Left: caption: "Finial from the 29th floor of the Woolworth Building (Cass Gilbert, architect), New York, 1913"

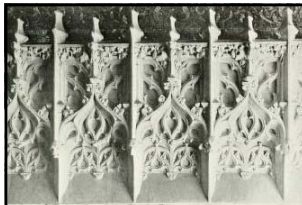
681



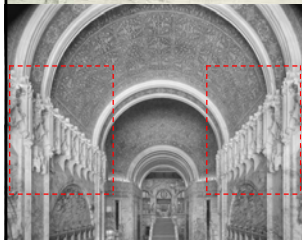
Cass Gilbert selected the firm of *Donnelly & Ricci* to design the *Woolworth Building's* handcrafted and expensive "foliate or intricate ornamental parts" – a.k.a. its architectural terra cotta tracery, crockets, pinnacles, and gargoyles. However, to ensure a close collaboration with the manufacturer; the *Atlantic Terra Cotta Company*, Gilbert required that the firm sculpt models at their *Perth Amboy, N.J.* factory rather than in Donnelly & Ricci's own workshops. In 1907, the *Standard Terra Cotta Company* of Perth Amboy merged with the *Atlantic Terra Cotta Company* based in nearby *Tottenville, Staten Island*. While all of the company's factories were involved in the production of architectural terra cotta for the *Woolworth Building*, because of its proximity to Manhattan the Perth Amboy factory played the most critical role in sculpting and production.

Left: caption: "Atlantic Terra Cotta Company factory, Tottenville, Staten Island. Plaster molds from old projects have been discarded outside of the factory and will be moved to a 'dumping ground' due to space limitations."

Right: caption: "The Standard Terra Cotta Company, Perth Amboy, NJ. The stacked materials in the shipment yard are finished terra cotta pieces that are waiting to be shipped by rail to the construction site." 682



Top: caption: "Modeling (Lobby Frieze) – Donnelly & Ricci"



Bottom: caption: "Woolworth Building. Detail of ornamental ceiling."

683



Eliseo Ricci, Donnelly & Ricci's partner-in-charge of the *Woolworth Building* project, directed the modelers. Many of these highly-skilled artisans trained as sculptors in some of the best European art schools. Models were prepared for approval and once approved, they were cut into manageable pieces in order to make plaster molds. Thereafter, the manufacture of the terra cotta could begin.

Above: two workers pose at the Perth Amboy factory with ornamental gargoyles (created for a theater in NYC). The large mittens of the worker at left indicates the recent removal of the gargoyles from the kiln. After leaving the kiln room, the gargoyles were numbered (with black paint) at the fitting shop in coordination with the on-site installation drawings. 684



Between January 22nd 1911 and April 29, 1911, T.R. Johnson's staff produced the working drawings for the terra cotta installation/s. The *Atlantic Terra Cotta Company* set up its own temporary office of twenty-five draftsmen on the Woolworth Building's 10th Floor. There, Johnson oversaw the production of full-scale drawings for the many design motifs. A second corps of draftsmen at the Perth Amboy factory enlarged and redrew the full-scale architect's drawings and reproduced them with a "shrinkage rule." Because clay shrinks in a predictable proportion when fired in a kiln, the ATC made its own shop drawings for its modelers to follow.

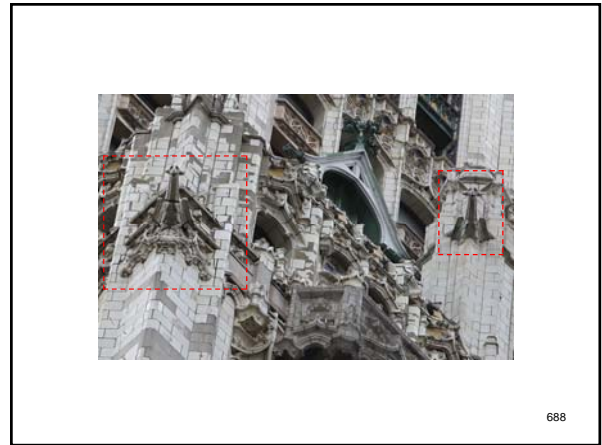
685




Above: terra cotta Gargoyle
Left: caption: "Lower New York from Woolworth Tower, 1927"



687



688



THE ATLANTIC TERRA COTTA CO. Manufacturers of... Architectural Terra Cotta

INCORPORATED UNDER THE LAWS OF THE STATE OF NEW YORK

ATLANTIC TERRA COTTA COMPANY
CAPITAL STOCK \$3,000,000

THE ATLANTIC TERRA COTTA CO. Manufacturers of... Architectural Terra Cotta

DIRECTORS:
 Dr. Frank Cooper, John H. Kester, William H. Johnson, George W. Johnson, Robert J. MacFarlane, William H. Miller, John W. Smith, John H. Smith, John H. Smith.

Main Office: 282 FOLWERTH AVENUE, NEW YORK.
TELEPHONE 67-1070

Philadelphia Office: REAL ESTATE TRUST BUILDING.
TELEPHONE 1-7777

Factory: TOTTEVILLE, S. I., NEW YORK.
TELEPHONE 1-7777

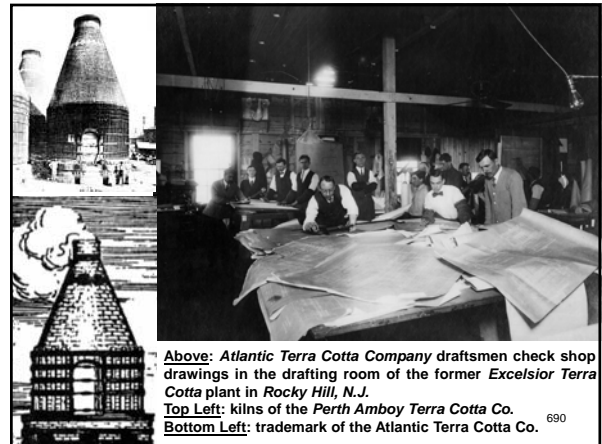
BOSTON: FRANK C. ELDER, 100 THOMAS ST.
FITZBURGH: JOHN W. SMITH & SON, 100 W. 10TH ST.
WASHINGTON: HORTON EXCELSIOR TERRA COTTA CO., 1000 14TH ST., N. W.

DETROIT: W. A. HENDEL, Federal Bank Bldg.
CLEVELAND: THOMAS T. BULLOCK, 100 NEW ENGLAND BLDG.
ATLANTA: W. M. GILBERT & CO., 1000 14TH ST.

NEW ORLEANS: J. DENNISVILLE & SON.

In 1907, three terra cotta manufacturers: *Perth Amboy Terra Cotta*, *Standard Terra Cotta* and *Excelsior Terra Cotta* became part of the *Atlantic Terra Cotta Company*.

689



Above: Atlantic Terra Cotta Company draftsmen check shop drawings in the drafting room of the former *Excelsior Terra Cotta* plant in Rocky Hill, N.J.
Top Left: kilns of the Perth Amboy Terra Cotta Co.
Bottom Left: trademark of the Atlantic Terra Cotta Co.

690



Edward de Csipkes was the lead model sculptor at Atlantic Terra Cotta (ATC) during the construction of the Woolworth Building. Born in Romania, de Csipkes trained at the Master Art School in Budapest, Hungary and was an internationally recognized sculptor before immigrating to the United States in 1903. In 1913, he moved to Tottenville, Staten Island and began work as a modeler at both the Tottenville and Perth Amboy ATC factories.

Left: caption: "Edward de Csipkes (first row, third from left) and Atlantic Terra Cotta craftsmen, ca. 1921"

Right: caption: "The Atlantic Terra Cotta Modeling Room"

691



Above & Left: caption: "Original terra cotta decorative ornament from the Woolworth Building, created by the Atlantic Terra Cotta Company"

692



"...cast and fired clay pieces, typically more intricately molded than brick. Used for decorative and fireproofing architectural purposes..."

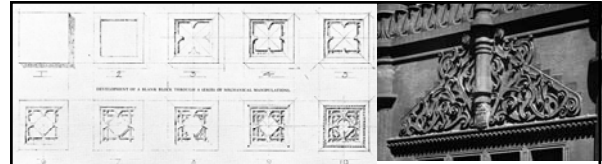
Judith Payne McBrien, Author

RE: excerpt from her book: "Pocket Guide to Chicago Architecture." Terra cotta was a popular material in both NYC and Chicago in the late 19th/early 20th Century/s. In large part, its popularity as a commercial building material is due to its fireproofing abilities. Such fireproof materials became popular following Chicago's great fire of 1871, which destroyed most of the city.

Left T&B: photographs of terra cotta pelican clay model (top) and in TC on the Woolworth Building's facade (bottom)



693



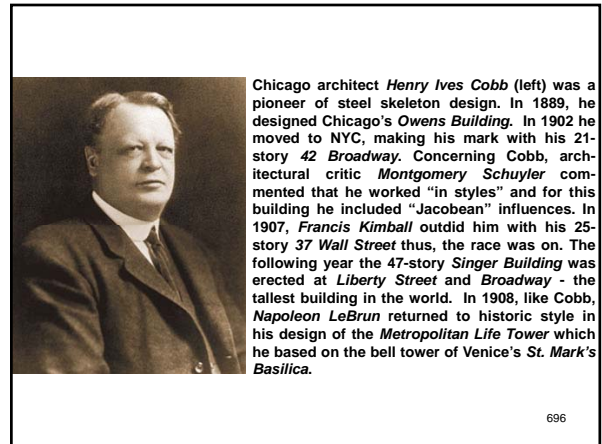
Above: caption: "Detail of Terra Cotta Decoration"

Left: caption: "Figure 45. Louis Sullivan, Plate 1 from A System of Architectural Ornament According with a Philosophy of Man's Powers, drawn 1922, published 1924"

694

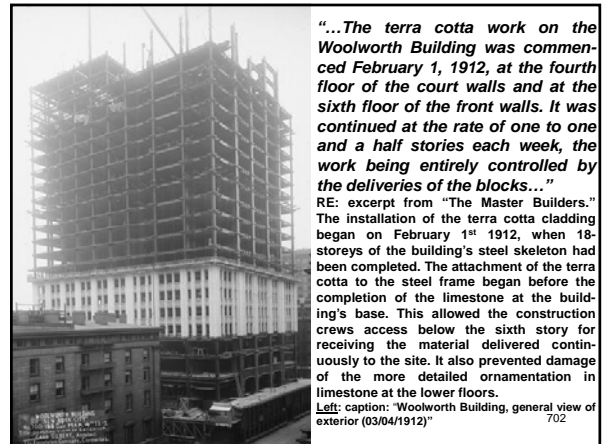
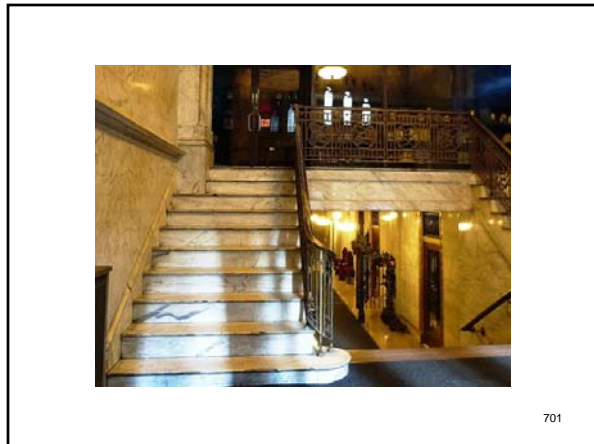
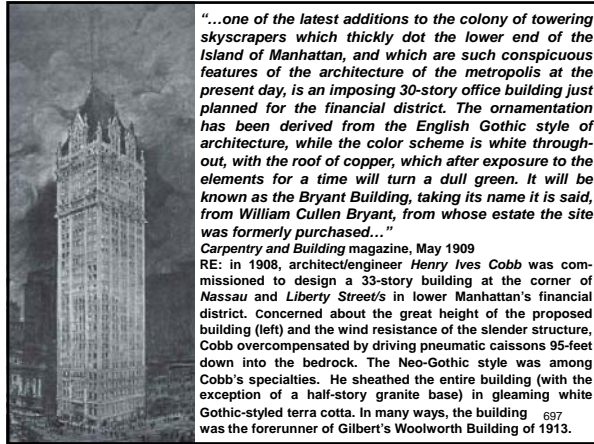
In Styles

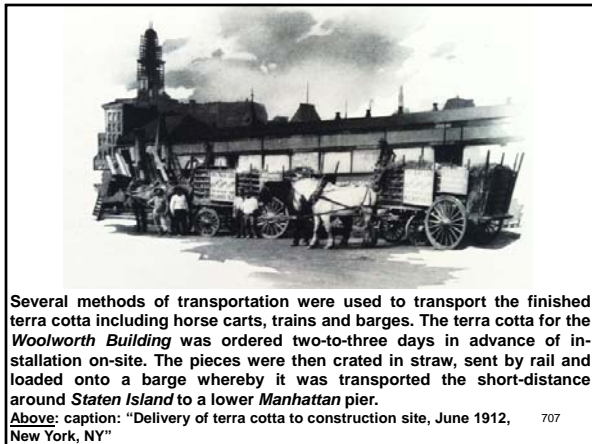
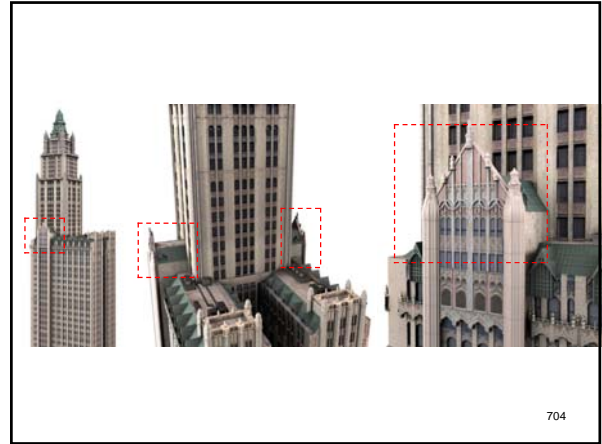
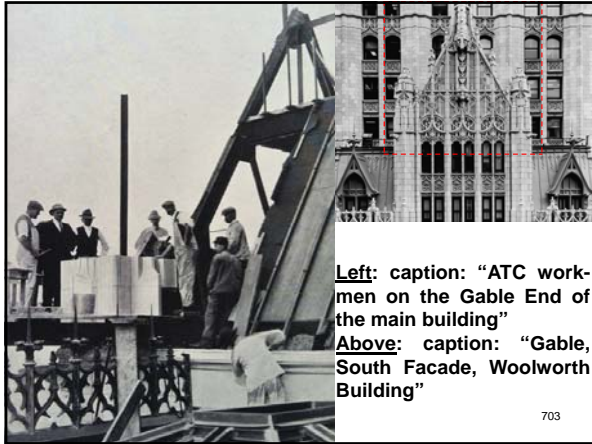
695



Chicago architect Henry Ives Cobb (left) was a pioneer of steel skeleton design. In 1889, he designed Chicago's Owens Building. In 1902 he moved to NYC, making his mark with his 21-story 42 Broadway. Concerning Cobb, architectural critic Montgomery Schuyler commented that he worked "in styles" and for this building he included "Jacobean" influences. In 1907, Francis Kimball outdid him with his 25-story 37 Wall Street thus, the race was on. The following year the 47-story Singer Building was erected at Liberty Street and Broadway - the tallest building in the world. In 1908, like Cobb, Napoleon LeBrun returned to historic style in his design of the Metropolitan Life Tower which he based on the bell tower of Venice's St. Mark's Basilica.

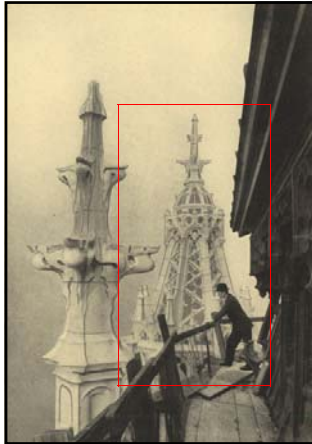
696





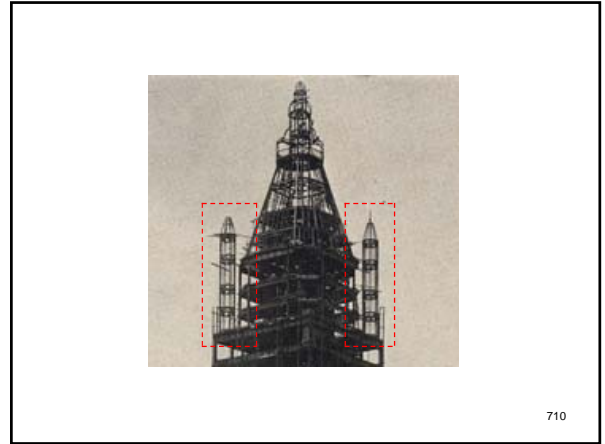
Ornamental Effects

708



In the century-plus of its existence, the most significant loss of original architectural terra cotta ornament was the *Tourelles*; four towers that rose from the 49th to 51st Floor/s at the corners of the main shaft (highlighted in the photo at left). These seemingly delicate towers (which ATC called "minarets") were constructed as independent features - each with its own steel skeleton, and were decorated with Gothic tracery and playful dog-head gargoyles.

709

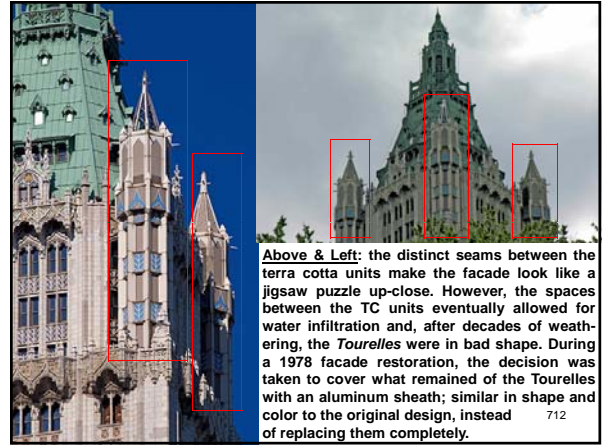


710



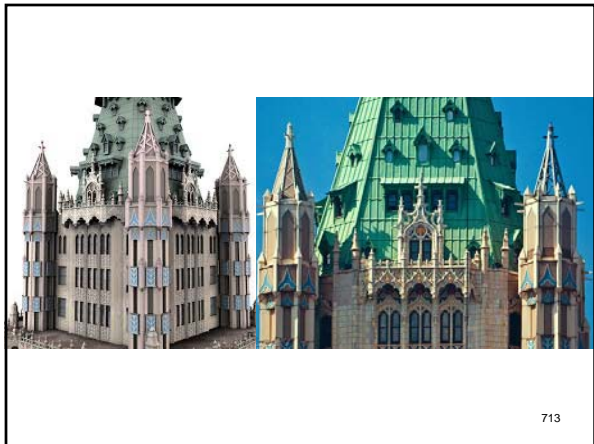
Left: caption: "Towers from the City Wall, Nuremberg, (1897). Cass Gilbert (1858-1934), American. Watercolor and pencil on paper mounted on paper-board. Smithsonian American Art Museum." Note the *Tourelles* (highlighted) at the corners of the base of the pyramidal roof at the top of the tower. No doubt this tower in Nuremberg, Germany influenced Cass Gilbert's design for the tower-top of the *Woolworth Building*. For the sloping roof/s, rolled gold leaf over copper would be used to good effect.

711

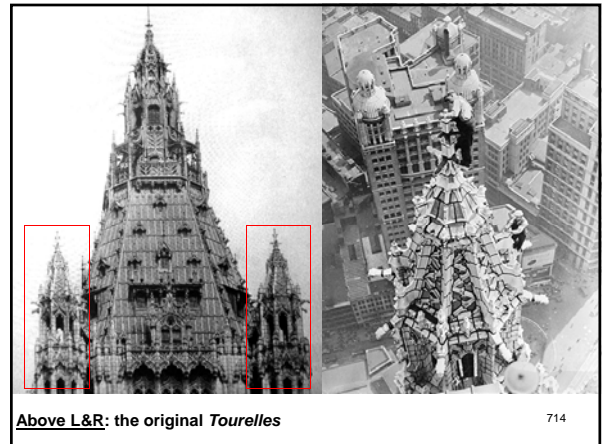


Above & Left: the distinct seams between the terra cotta units make the facade look like a jigsaw puzzle up-close. However, the spaces between the TC units eventually allowed for water infiltration and, after decades of weathering, the *Tourelles* were in bad shape. During a 1978 facade restoration, the decision was taken to cover what remained of the *Tourelles* with an aluminum sheath; similar in shape and color to the original design, instead of replacing them completely.

712

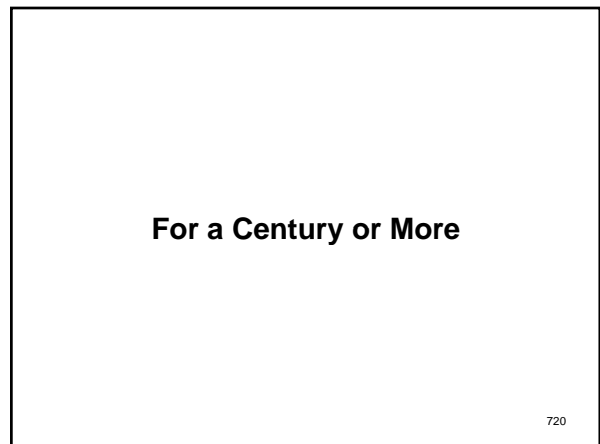
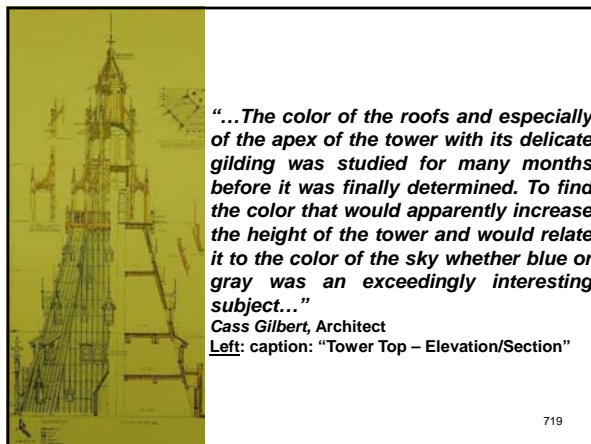
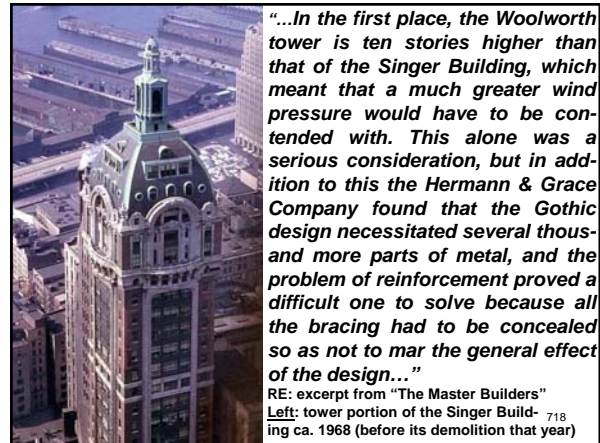
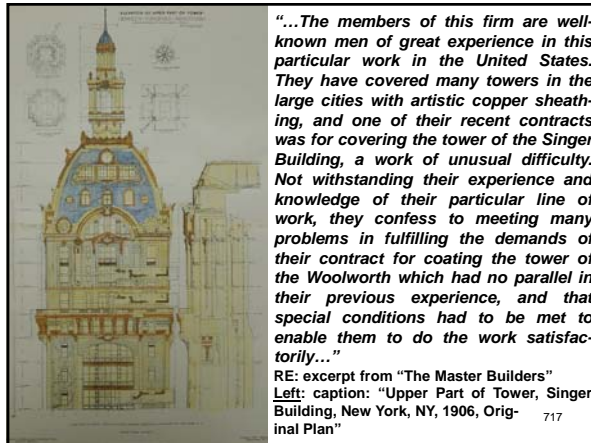
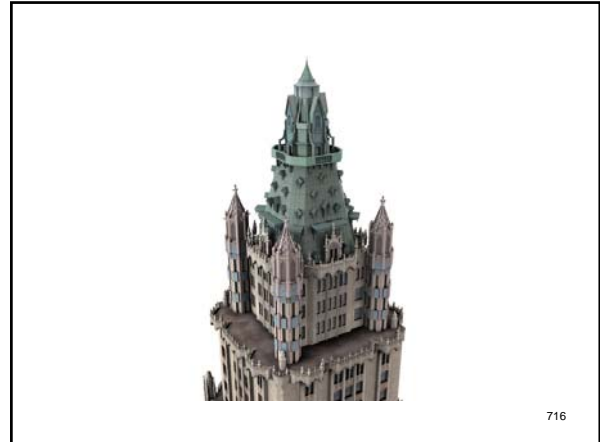
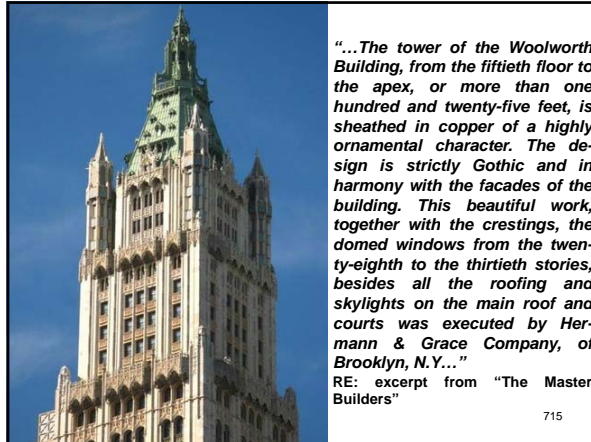



713



Above L&R: the original *Tourelles*

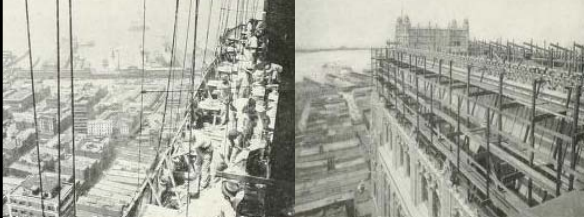
714





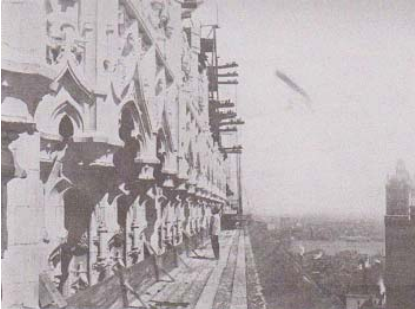
“...Then arose the question of guarding the lives of the mechanic who would do the work over 700 feet in the air under variable wind pressures. It was necessary to protect their lives, so well as the lives of the public in the streets below. Determination and splendid ability, however mastered the difficulties. Scaffolding and outrigging were made specially to meet the necessities of the case, and the work proceeded amid several gales and wind storms which often reached a velocity of one hundred miles an hour, but there was neither accident to the men nor disturbance of a single piece of work. After such an experience in course of construction, there can be little doubt that the Gothic copper-covered tower of the Woolworth will retain its handsome appearance for a century or more, and the Hermann & Grace Company deserves high praise for a great achievement under uncommon conditions of difficulty without an accident...”

721
RE: excerpt from “The Master Builders”



“...Scaffolding, whether for the fifth or the fiftieth floor, is an all important consideration, and only such as had been proved, beyond all question, to be absolutely safe and easily adjusted was taken into consideration by the general contractors for the Woolworth...The Patent Scaffolding Company installed mechanical appliances for the control of the suspended platforms upon which many lives depended in the exterior brick and iron work of the building. When the great height of the building is contemplated in connection with the terrific wind of late fall and winter, when the scaffolding did its work, the superiority of the machinery and platforms will be understood. No accident occurred and not a life was lost...The Chesebro-Whitman Company, of New York City, built the scaffolds around the tower and mansard roofs when it was determined that these roofs and the tower should be decorated in gold...”

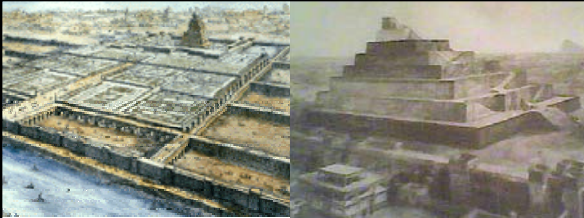
722
Left: caption: “Suspended Platforms – Patent Scaffolding Co.”
Right caption: “Scaffolding – Chesebro-Whitman Co.”



723

In the Days of Nebuchadnezzar

724

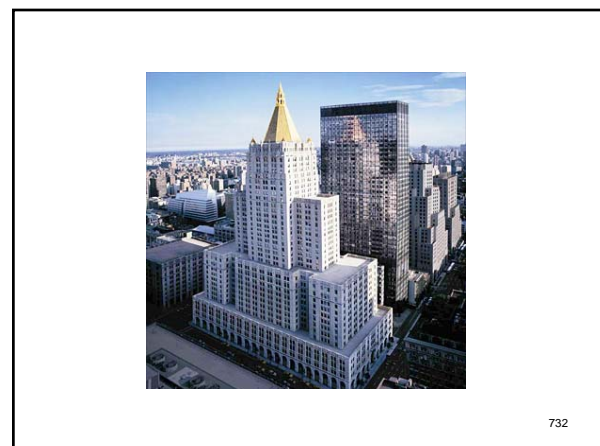
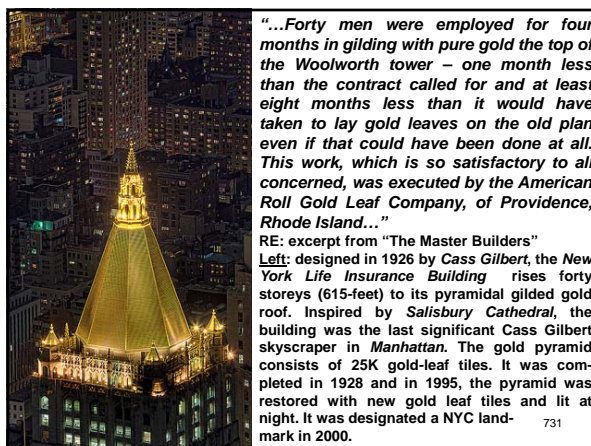
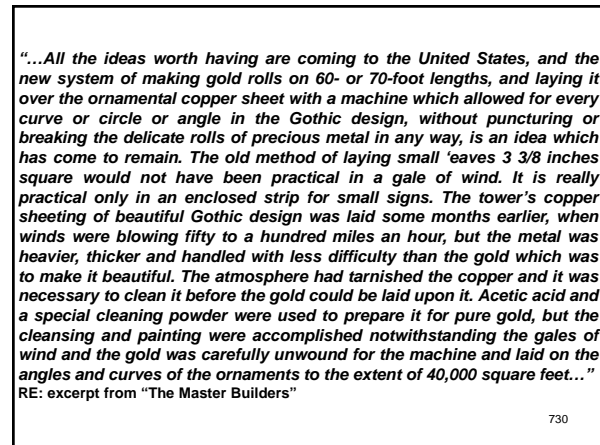
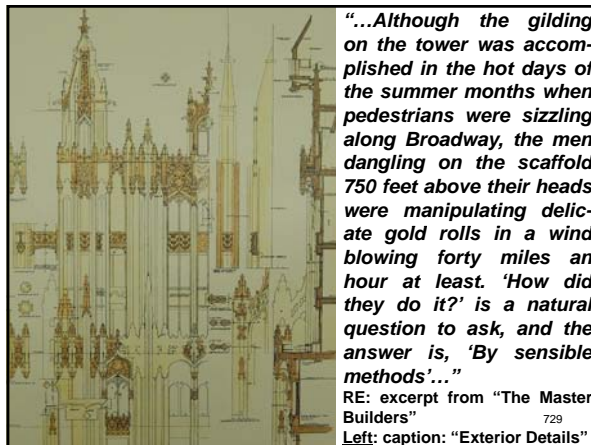


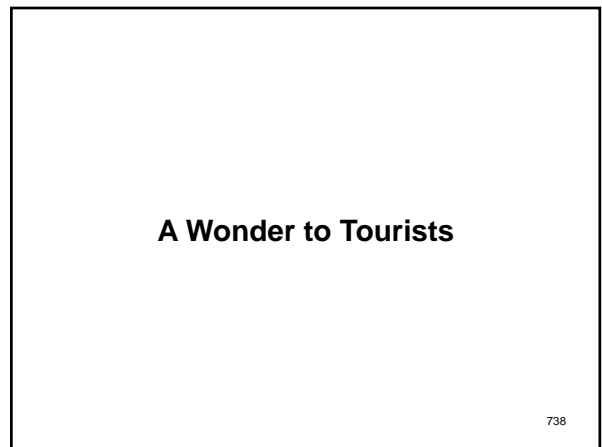
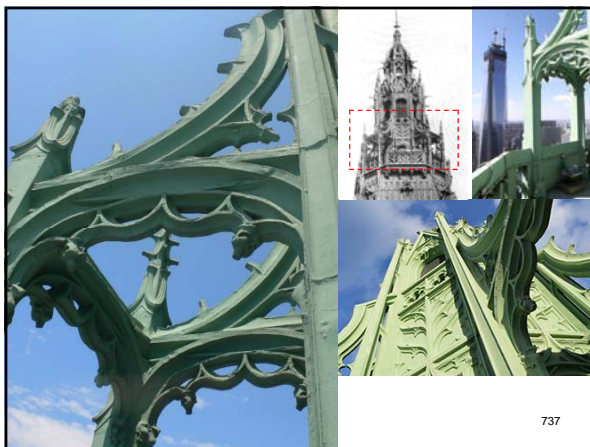
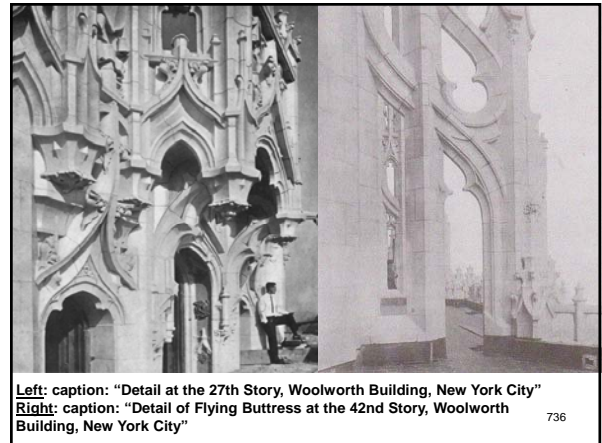
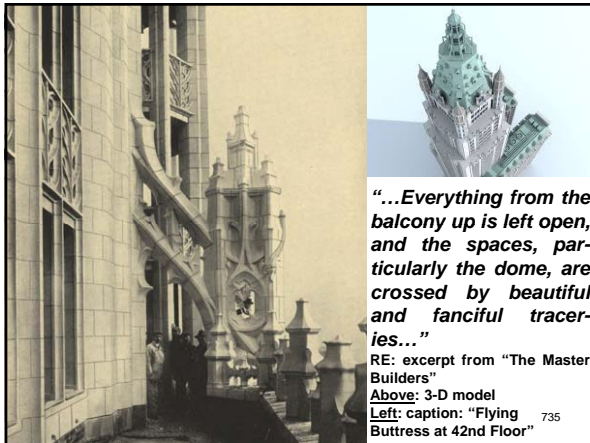
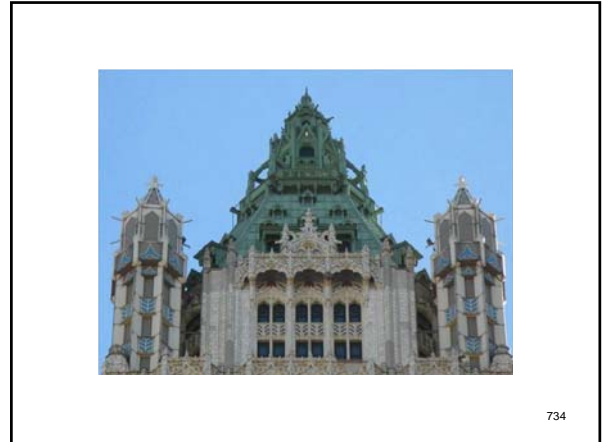
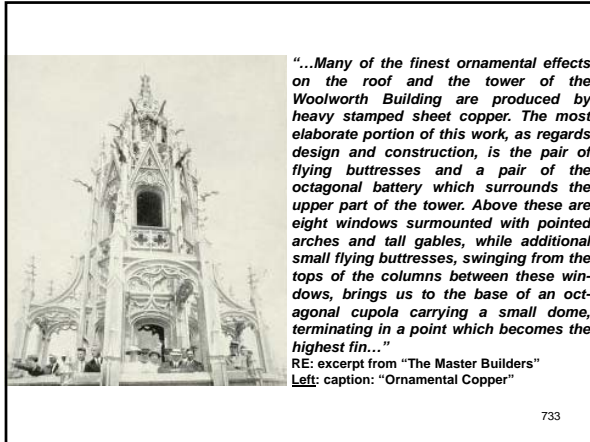
“...In the days of Nebuchadnezzar the great Babylonian temple erected to god Bel, and called the ‘Imgur Bel,’ stood upon a square of brick measuring 1,600 yards. The summit of the temple was surrounded by a figure of solid gold, forty feet high, representing the god Bel. This image must have weighed several tons. There was no gold leaf in those days, when the temples were topped with golden images. Whether the vast expenditure in decorating temples with images of solid gold was an expression of devotion to the particular god worshipped there or a means of attraction is not known...”

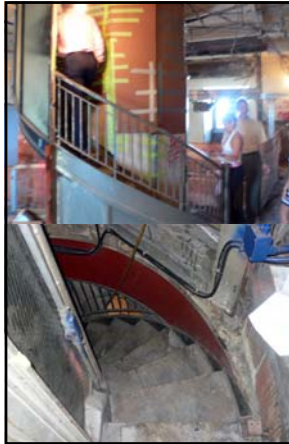
725
RE: excerpt from “The Master Builders”
Above L&R: the ancient city of Babylon (left) and the Temple of Bel (right)

Look Up and Smile

726







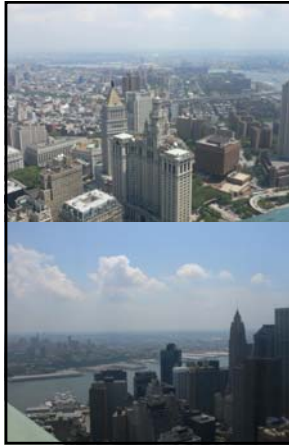
“...At one time, its tiny 58th-floor observation deck was open to the public, who paid 50 cents, or five dimes, for a tour. They first took an elevator to the 54th floor, then transferred to another elevator made of glass, which went to the 58th. Above this deck is ‘The Lantern,’ which once shone a bright light like a lighthouse. Afterwards, visitors shopped in the ‘highest retail store in the world on the 55th floor...which consisted of mostly trinkets.’”

New York Post, May 25th 2014
 RE: the pinnacle observatory was promoted as a “wonder to tourists.” By 1916, it drew more than 100K people a year from over 60 countries. Visitors purchased tickets for \$0.50 at a booth near the Barclay Street entrance then, they were shuttled in a high-speed elevator to the 54th Floor, where they could buy postcards, souvenirs and ice cream at the “highest retail location in the world.” To ascend to the 58th Floor outdoor terrace, they could take a six-person circular glass elevator or climb a spiral staircase (left T&B).

739



740



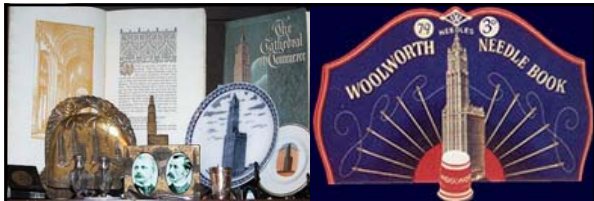
“Looking down on the thousands of great structures, the wonderful bridges that span the East River, the beautiful parks, the great steamers berthed at piers along the rivers, one realizes the grandeur and vastness of the metropolis. The serried peaks made by the giant buildings, towers, church steeples all seem to contend with each other for the distinction of ‘highest and greatest.’ But above them all rises the Woolworth Building, calm and unassailable.”

H. Addington Bruce, Author

741



742



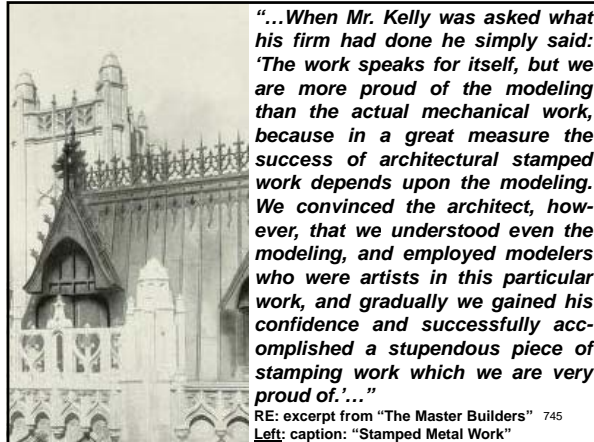
Left: as construction drew to a close, FW built a range of souvenirs to sell in his stores for five and/or ten-cents (in the gift shop next to the *Observation Gallery*). A celebration plate was struck by a British supplier. A German vendor produced a dainty full-color ring tray. The selection also included brass egg cups, picture frames and crumb trays as well as guide books, cards and stereoscopes. A brass *Woolworth Building* money box was touted as being “ideal for collecting nickels and dimes.”

Right: The most popular and enduring Woolworth Building souvenir was also the simplest and cheapest to make. In 1913, the *British Needle Company* re-engineered its assortment of sewing and darning needles onto a five-cent card depicting the Woolworth Building. Millions were made and shipped across the Atlantic over the next eighteen months. The line was such a good seller that during WWI, as U-boats closed the supply line, FW licensed the design for manufacture in the U.S.

743

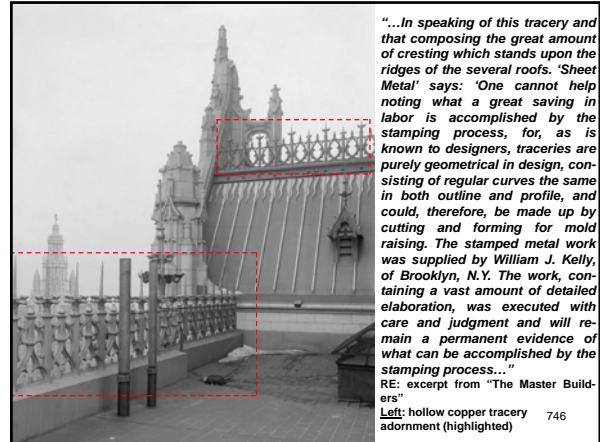
Speaking for Itself

744



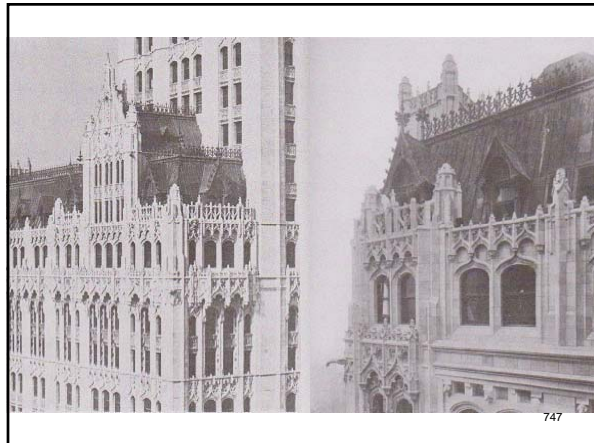
“...When Mr. Kelly was asked what his firm had done he simply said: ‘The work speaks for itself, but we are more proud of the modeling than the actual mechanical work, because in a great measure the success of architectural stamped work depends upon the modeling. We convinced the architect, however, that we understood even the modeling, and employed modelers who were artists in this particular work, and gradually we gained his confidence and successfully accomplished a stupendous piece of stamping work which we are very proud of.’...”

RE: excerpt from “The Master Builders” 745
Left: caption: “Stamped Metal Work”

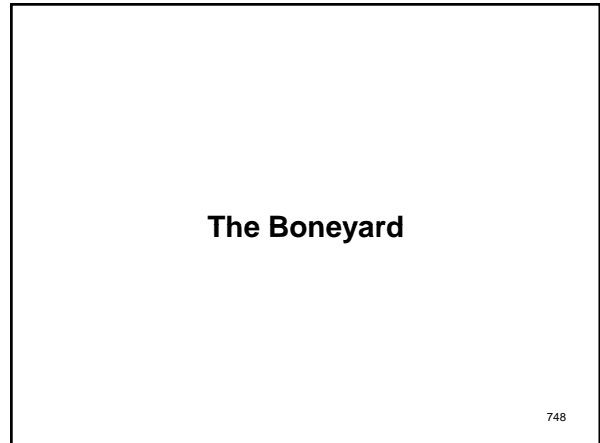


“...In speaking of this tracery and that composing the great amount of cresting which stands upon the ridges of the several roofs. ‘Sheet Metal’ says: ‘One cannot help noting what a great saving in labor is accomplished by the stamping process, for, as is known to designers, tracteries are purely geometrical in design, consisting of regular curves the same in both outline and profile, and could, therefore, be made up by cutting and forming for mold raising. The stamped metal work was supplied by William J. Kelly, of Brooklyn, N.Y. The work, containing a vast amount of detailed elaboration, was executed with care and judgment and will remain a permanent evidence of what can be accomplished by the stamping process...’”

RE: excerpt from “The Master Builders”
Left: hollow copper tracery adornment (highlighted) 746



747

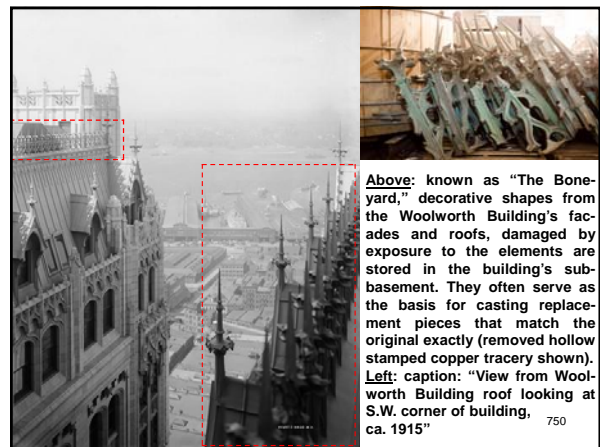


The Boneyard


748



Above: original copper tracery. The gabled roof/s and 30th Floor setback/s of the main office block (base) were decorated with delicate filigree made of hollow copper. It was removed due to deterioration caused by acid rain. 749




Above: known as “The Boneyard,” decorative shapes from the Woolworth Building’s facades and roofs, damaged by exposure to the elements are stored in the building’s sub-basement. They often serve as the basis for casting replacement pieces that match the original exactly (removed hollow stamped copper tracery shown). Left: caption: “View from Woolworth Building roof looking at S.W. corner of building, ca. 1915” 750



"What everyone thought was copper hasn't been copper since before 1950."
 Roy Suskin, VP of Development, 233 Broadway Owners L.L.C. (July 2005)
 RE: most New Yorkers believed the cladding of the Woolworth Building's rooftops was copper, and that they had turned to the familiar green patina (top) from its interaction with oxygen over the years. No wonder then that the appearance of white (where there had been green before) confused the masses below. As it turns out, acid rain ate through the original copper roof and since then its been covered in a green protective coating that matched the patina of the oxidized copper. The mysterious white paint (bottom) was a primer coat for an application of a fresh coat of green paint.

751




When opened, the *Woolworth Building* had the tallest chimney in the world. During the course of the building's renovations, the chimney (which spanned the height of the building) was demolished and new elevators were installed in its place. These elevators serve the tower.

752



753

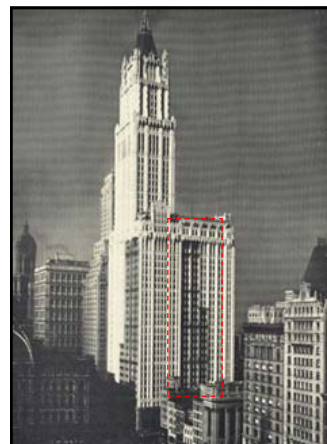


"...The copper roofs on the Tower and on the main building are connected by means of copper cables within the Building's structural steelwork, thereby grounding the structure and producing a result similar to the ordinary lightning conductor. Thus, the Building is safe even during severe lightning storms..."
 RE: excerpt from "The Cathedral of Commerce"

754

The Conquest of Mount Woolworth

755



As early as 1913, the Woolworth Building's terra cotta facade was darkened with soot from NYC's "sulfurous atmosphere." Workers used a scaffolding system to clean the terra cotta tiles with a combination of the popular household cleaning agent *Gold Dust* washing powder and sand grit. In 1932, the ATC carried out a second cleaning campaign of the building's facade.

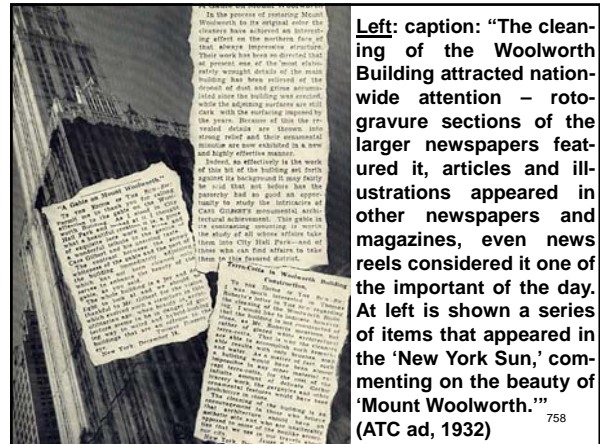
Left: caption: "The illustration at left, taken shortly before the cleaning operation was completed, shows the dominance of this majestic tower in the skyline of lower Manhattan. The washing has clearly revealed its wealth of Gothic detail, with its character and plentitude of modeling that would have been economically in any material except Terra Cotta. The eight polychrome colors that were used to accentuate all details such as the spandrels, pinnacles, canopies and window jambs have perfectly retained their richness and beauty." 756 (ATC advertisement, 1932)

756



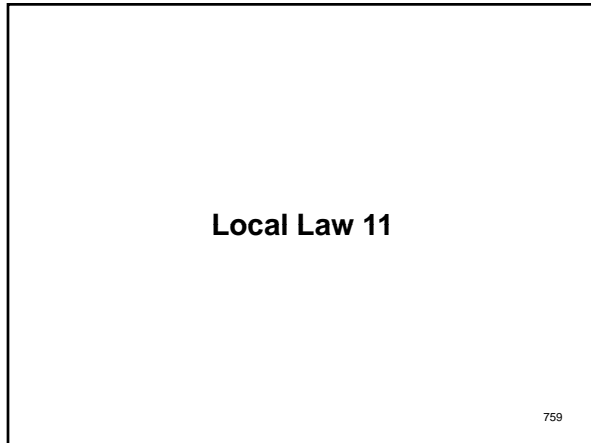
Left: caption: "Men cleaning exterior of the Woolworth Building, detail of setback, side elevation at SE corner, ca. 1913"

757



Left: caption: "The cleaning of the Woolworth Building attracted nationwide attention – rotogravure sections of the larger newspapers featured it, articles and illustrations appeared in other newspapers and magazines, even news reels considered it one of the important of the day. At left is shown a series of items that appeared in the 'New York Sun,' commenting on the beauty of 'Mount Woolworth.'" (ATC ad, 1932)

758



Local Law 11

759

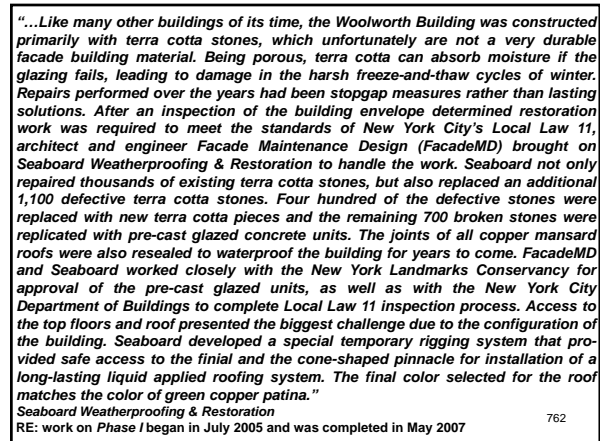


"Cass Gilbert's Woolworth Building at 233 Broadway in Lower Manhattan, completed in 1913, is getting a \$2.2 million facelift to renovate its historic exterior features. Facade Maintenance Design of New York is architect on the exterior renovation of the 57-story landmark. The project involves restoring damaged limestone, resealing 25,000 sq. ft. of copper mansard roofs, and repair or replacement of more than 600 terra cotta stones. Both the architect and the general contractor on the job, Seaboard Weatherproofing and Restoration of Port Chester, N.Y., also handled the exterior and roof restoration earlier this year on another Gilbert-designed landmark several blocks away, 90 West Street, which had suffered extensive facade damage in the World Trade Center attacks in 2001. Completion of the Woolworth restoration is scheduled for the end of the year, with additional stone replacement extending into next year..."

760

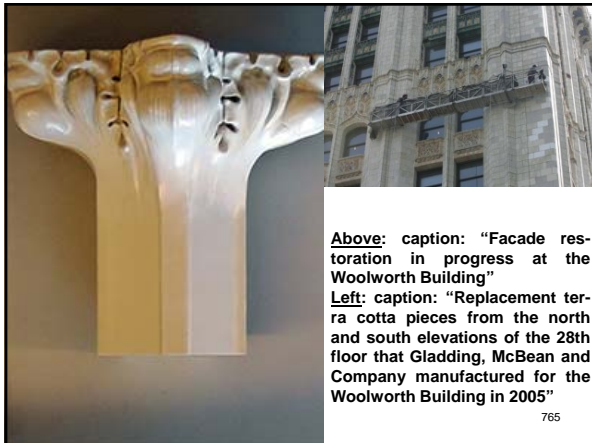
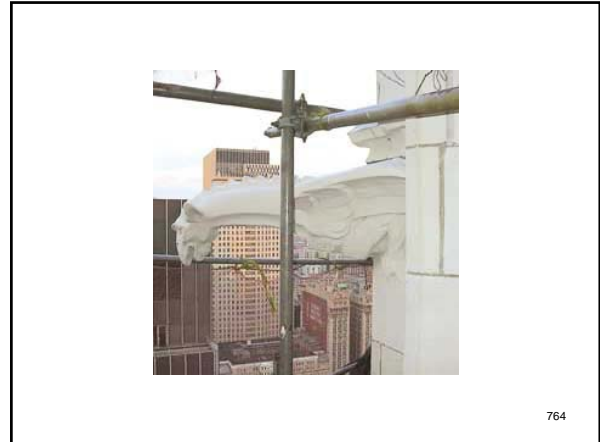
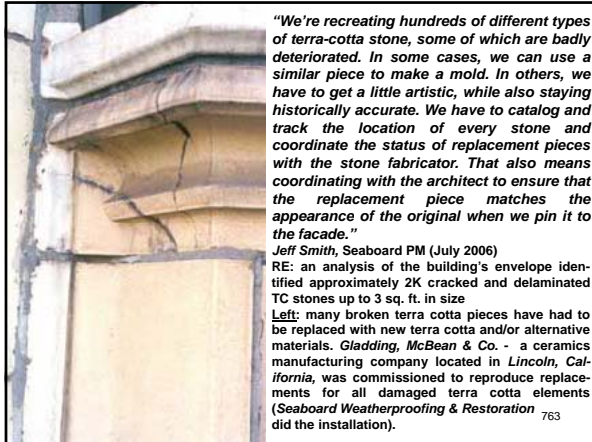


761



"...Like many other buildings of its time, the Woolworth Building was constructed primarily with terra cotta stones, which unfortunately are not a very durable facade building material. Being porous, terra cotta can absorb moisture if the glazing fails, leading to damage in the harsh freeze-and-thaw cycles of winter. Repairs performed over the years had been stopgap measures rather than lasting solutions. After an inspection of the building envelope determined restoration work was required to meet the standards of New York City's Local Law 11, architect and engineer Facade Maintenance Design (FacadeMD) brought on Seaboard Weatherproofing & Restoration to handle the work. Seaboard not only repaired thousands of existing terra cotta stones, but also replaced an additional 1,100 defective terra cotta stones. Four hundred of the defective stones were replaced with new terra cotta pieces and the remaining 700 broken stones were replicated with pre-cast glazed concrete units. The joints of all copper mansard roofs were also resealed to waterproof the building for years to come. FacadeMD and Seaboard worked closely with the New York Landmarks Conservancy for approval of the pre-cast glazed units, as well as with the New York City Department of Buildings to complete Local Law 11 inspection process. Access to the top floors and roof presented the biggest challenge due to the configuration of the building. Seaboard developed a special temporary rigging system that provided safe access to the finial and the cone-shaped pinnacle for installation of a long-lasting liquid applied roofing system. The final color selected for the roof matches the color of green copper patina." Seaboard Weatherproofing & Restoration RE: work on Phase I began in July 2005 and was completed in May 2007

762



Gladding, McBean's process of creating the plaster mold and glazed terra cotta pieces followed the original construction methods of ATC:

- **Step 1** - design the terra cotta ornament and create plans and drawings for its production;
- **Step 2** - create a model of the terra cotta ornament in clay;
- **Step 3** - cover finished clay model in plaster to make mold;
- **Step 4** - remove the clay model from the plaster mold;
- **Step 5** - press malleable clay into the plaster mold;
- **Step 6** - enclose the pressed clay with plaster;
- **Step 7** - hollow clay to lighten the piece;
- **Step 8** - remove the plaster mold;
- **Step 9** - paint and glaze clay and send to the kiln for firing;
- **Step 10** - remove the piece from kiln and check its condition, and;
- **Step 11** - the terra cotta piece is packaged and shipped to client

766



Something Special

768

"On the basis of careful consideration of the history, the architecture, and other features of this building, the Landmarks Preservation Commission finds that the Woolworth Building has a special character, special historical and aesthetic interest and value as part of the development, heritage, and cultural characteristics of New York City. The Commission further finds that, among its important qualities, the Woolworth Building is among the best-known skyscrapers in New York and the country; that it is the most famous design of Cass Gilbert, a nationally prominent architect; that Gilbert's design for a romantic, Gothic-inspired polychromatic terra-cotta exterior over a steel-cage tower joined Mid-western theories of structural expression with Eastern preferences for historical styles; that the Woolworth Building was the final monument in the first phase of skyscraper development that culminated in the romantic skyscraper-tower type; that its design embodied concepts elaborated in the post-World War I skyscrapers which permanently redefined the skyline of New York and the image of twentieth-century urban America; that as the tallest building in the world for sixteen years it gained an international reputation; that it was built to be the headquarters and symbol of F.W. Woolworth Company, a nationally known institution and among the most prominent of the mass-merchandizing chains typical of twentieth-century American retailing; and that the Woolworth Building today is recognized as one of the great symbols of twentieth-century America, and one of New York's and the country's outstanding landmarks..."

RE: excerpt from the LPC's "Findings and Designation" establishing the Woolworth Building as a NYC Landmark on April 12th 1983

769

Part 8

Up & Down

770

The Question of Elevators

771

"...Perhaps the most difficult problem in a structure as tall as the Woolworth Building is the question of elevators. The Building's success depends largely upon the adequacy, safety and regularity of the elevator service. The architectural design of the Building, together with the peculiarities and difficulties of its structural steelwork, to a very great extent govern the number, arrangement and grouping of elevators. This important feature has been carefully studied, and as a result, twenty-nine high-speed electric traction elevators afford excellent service throughout the twenty-four hours of each day, every day in the year, Sundays and holidays included..."

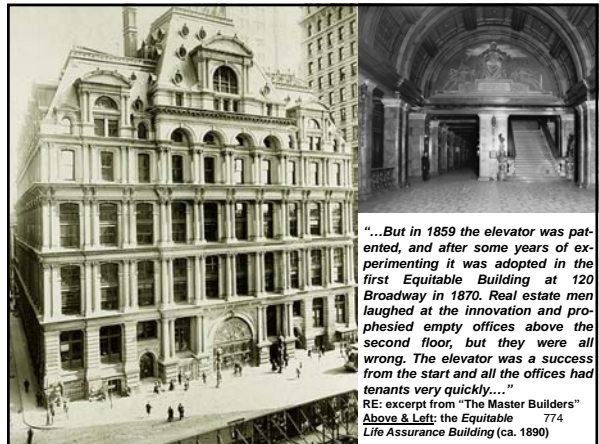
RE: excerpt from "The Cathedral of Commerce." FW had heard of several elevator disasters in other tall buildings thus, he instinctively understood the real concerns of potential tenants and determined to have the world's safest elevators built for his skyscraper.

772

"...When elevators and steel or iron girders and frames were only architectural dreams, owners of land could find no way to erect buildings which would yield a profitable rent. Rock foundations were not sought by boring to any great depth in those days, and very thick and costly walls were built to support even five- and six-story buildings. But when these were built, tenants would not climb more than one or two flights of stairs and pay a fair rental..."

RE: excerpt from "The Master Builders"

773



"...But in 1859 the elevator was patented, and after some years of experimenting it was adopted in the first Equitable Building at 120 Broadway in 1870. Real estate men laughed at the innovation and prophesied empty offices above the second floor, but they were all wrong. The elevator was a success from the start and all the offices had tenants very quickly..."

RE: excerpt from "The Master Builders"
Above & Left: the Equitable
Life Assurance Building (ca. 1890)

774



In April 1880, **Werner von Siemens** (left) demonstrated the first electric powered elevator at the "Mannheim Pfalzgau Trade & Agricultural Exhibition" (right). With a motor mounted on the bottom of the cab, Siemens' electric elevator used a gearing system to climb wall shafts fitted with racks. Although novel, this electric elevator was still too crude to compete with the existing steam-driven, hydraulic elevator technology. Intended simply as an illustration of the broad applicability of his pioneering work in DC traction motors, Siemens had little interest in pursuing the electric elevator further. Instead, Siemens focused on large projects, such as electric trains and electric power systems.

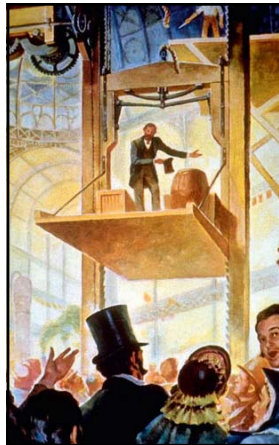
775



While electric traction was new, the elevator was not. The use of hoists to lift material in mines, construction sites and warehouses had been in use for centuries

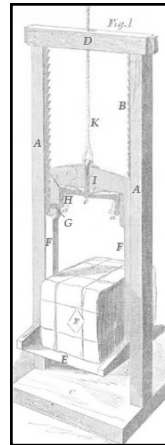
Left: caption: "A Steam-Driven Elevator of Early Date"

776



The first elevators designed expressly for passenger use were introduced in the 1850s. In 1854, in a dramatic demonstration at the *New York Crystal Palace Exhibition*, **Elisha Graves Otis** demonstrated the first "Safety Elevator." With the elevator set-up in a prominent part of the exhibition hall, he stood on the elevator platform as it was raised four storeys (left). He then had the suspension rope cut. The audience gasped, but the platform did not fall to the ground. Instead, it stood locked and safely suspended above the ground. Four years later in 1857, Otis installed the first passenger elevator in *E.V. Haughwout & Co.*, a store located on *Broadway* in NYC. Powered by a steam engine, the elevator at Haughwout was the talk of the city, attracting thousands of curious visitors to the store.

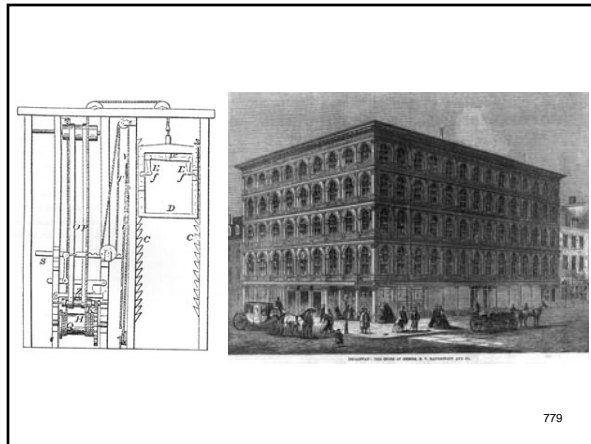
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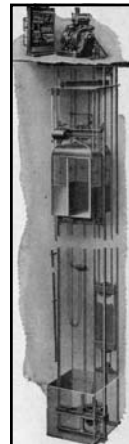
"...when power is applied to the lifting rope (K), the rope pulls on a vertical rod (I), which in turn pulls on right-angled levers (H), thereby pulling two pawls (G) away from the racks (B) secured to the inner sides of the vertical posts (A). This system prevents the pawls from bearing against the racks during the upward movement of the frame (F) and platform (E), and much friction is obviated thereby. When the pull on the rope stops, the pawls automatically catch into the racks again. By design, the pawls are also kept free from the racks during the elevator's normal downward passage. If the rope should break, or be loosened from the driving shaft, or disconnected from the motive power accidentally, the platform will be sustained, and no injury or accident can possibly occur, as the platform is prevented from falling..."

Left: diagram of **Elijah Otis**' "Safety Elevator" which was demonstrated at NYC's *Crystal Palace World's Fair* of 1854. Otis died in 1861, but his sons continued the business introducing many new innovations.

778



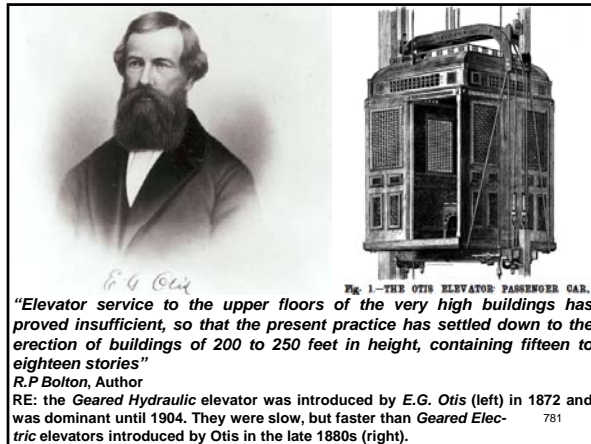
779



In the 1880s, the firm founded by **Elisha Graves Otis**; *Otis Brothers & Co.*, established electric power as the paradigm in elevator design. Along with the cage frame, the electrical elevator lead directly to the birth of the *Skyscraper*, but acceptance of the electrified elevator came slowly. Electricity was a new technology and a source of both fear and wonderment. Electricity was a mysterious, unseen force that moved through slender wires. It could magically light a room or street - but it could also kill. Fear of electrical energy was bad enough, but anxieties were increased significantly when coupled with the thought of being suspended in an elevator twenty or more stories above the ground. Considerable progress was needed before electricity could be used and accepted in elevators. It took several decades to move from Siemens' demonstration elevator to one that could move people swiftly and safely in tall buildings. The first electric elevators were geared thus, they were very slow making high floors less desirable.

Left: caption: "A Complete Installation of a 2:1 Electric Geared Traction Passenger Elevator, Showing Machine and Controller at Top of Hatchway"

780



"...To a very large extent the success of the modern high office building as a paying investment must depend upon its elevator service. Every floor must be readily accessible and must be reached in the shortest possible time. During business hours time is too valuable to be wasted in waiting long for an elevator, or in spending ten, or even five, minutes in reaching a floor which should be reached in as many seconds..."

RE: excerpt from "The Master Builders"

782

"...It is only forty-three years since the installation of the first elevator in a New York City office building, and about a quarter of a century since the first steel skeleton was erected to be enveloped in stone or terra cotta..."

RE: excerpt from "The Master Builders (1913)." The breakthrough came in 1902, when the Otis Elevator Co., after a costly R&D effort, pioneered the first Gearless Electric Traction Elevator. First installed in a NYC building in 1904, the innovation was an ingenious combination of electrical and mechanical subsystems. Almost overnight, this new electric elevator rendered the geared electric and the faster hydraulic elevator obsolete for tall buildings, opening up a whole new world of possibilities for architects and the skyscraper form. From 1906 to 1912, several buildings forty-six stories and taller were built in NYC including; the *Singer Building*, the *Metropolitan Life Tower* and the *Woolworth Building*. The addition of electro-mechanical and, later, electronic-switching devices, enabled gearless traction electric technology to make even taller buildings like the *Chrysler* (1930) and *Empire State Building*'s (1931) possible.

783

"Elevators became an essential part of office building construction. This new means of vertical transportation brought about a complete reversal of building operations and rental policies. The lower floors were no longer as desirable as they were in non-elevator buildings because the demand now shifted to the upper stories which were removed from the noise and dust of the street. The upper floors actually commanded higher rents."

William T. Hogan, Author

RE: with the advent of high-speed elevator service, the lower floors of buildings would no longer be as desirable as the higher floors thanks to the gearless electric traction elevator

784

Safety, Reliability, Speed and Simplicity

785

Otis Elevators

The achievement of this Company in producing the highest type of elevator has gained for its products recognition as the standard of excellence throughout the civilized world.

Quality, Safety, Efficiency, and Permanency

Otis Elevators are the ONLY ones that have made possible the construction of the Titanic structure of steel and steel that stretches where every one else uses iron and masonry, the ONLY ones that have broken the "eleven floor" and intelligently determined the load values of the world's greatest cities, opening to them unlimited developments, concentrations, and progress.

A practically complete record of their construction is published in the Otis Record, and this Record is available to all who desire it. It states both the kind and the quality of their work.

This installation operates on the following groups:


- Passenger
- Freight
- Hotel
- Garage
- Fire
- Special
- Construction
- Power
- Water
- Gas
- Oil
- Coal
- Ice
- Food
- Chemical
- Pharmaceutical
- Medical
- Dental
- Veterinary
- Industrial
- Commercial
- Public
- Private
- Government
- Naval
- Military
- Air Force
- Army
- Navy
- Marine Corps
- Civilian
- Foreign
- Domestic
- International
- Worldwide

Otis Elevator Company
17 Rector Place, New York
Branches in all principal cities in the world

"...It was considered fitting that a building of such architectural excellence and completeness as the Woolworth should be provided with the most modern transportation facilities. With a view to selecting the best, all the different elevator systems in use were carefully investigated and tested, having in mind the extraordinary height of this building, as well as the many floors to be served. As a result of this investigation, in which safety, reliability, speed and simplicity were paramount to every other consideration, the contract for the entire equipment was awarded to the Otis Elevator Company of New York..."

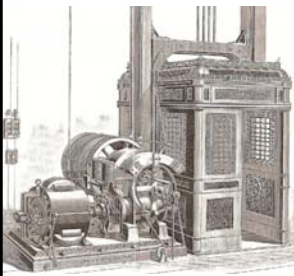
RE: excerpt from "The Master Builders"
Left: Otis Elevator Co. ad featuring the Woolworth Building which appeared in *Architectural Record* magazine (ca. 1912)

786



"When we installed our elevators in the Woolworth Building we were met by a problem which, while not entirely new, we were forced to solve in a different way. It is only in this building that elevators run uninterruptedly for fifty stories and more, so that the matter of safety had to be attended to with special care; we arranged the shafts in a manner to allow a car to drop from the top floor without danger to the passengers; ordinary doors could not withstand the pressure generated at the bottom by such a drop, so the thickness of the enclosure doors, as well as the height of the air-cushions, were increased; the increase in weight of the doors was such that it became unpractical to work them by hand and we installed an automatic system. The air-cushions cover a fifth of the shaft, and are so safe that recently, when a test was made at the Empire Building, a car containing a basket of eggs was allowed to drop twenty floors and when it was checked in its downward flight by the air cushions, it was found that not an egg had been injured. The elevator system in the Woolworth is unique, not from the number of elevators – there are only twenty-nine – but from the fact that in a building of that height the rapidity of transportation becomes of the utmost importance. It is the fastest service in the world; the cars easily attain a speed of seven hundred feet per minute, and they are all controlled from one central station; the dispatcher, by means of miniature lamps on a position indicator, can read the exact location of all the cars, whether stationary or in motion."

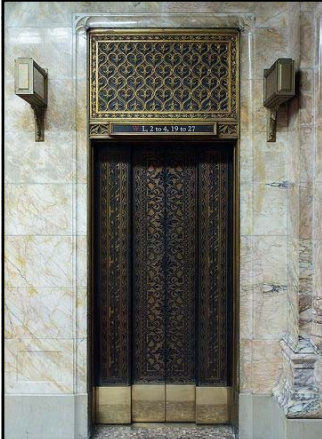
787
Otis Elevator Company



FW instructed his architect; Cass Gilbert, that it should not take more than one minute for visitors to reach the 51st Floor of the building – 680-feet above the Lobby. Thus, 700fpm was established as the standard for high-speed elevator service in NYC skyscrapers.

Left: caption: "Gearless Electric Traction Elevator Apparatus"


788



"...These elevators travel on a headway of twenty-five to thirty-five seconds during business hours, which means that a car is available to carry passengers up or down from any floor about every half-minute, and this service is faithfully maintained. In order to get tenants, their employees and clients to and from the offices with the least possible delay, many of the elevators are operated at a speed greater than that maintained in any other building, yet they travel so smoothly and noiselessly that their movements are scarcely observed..."

RE: excerpt from "The Cathedral of Commerce"

789

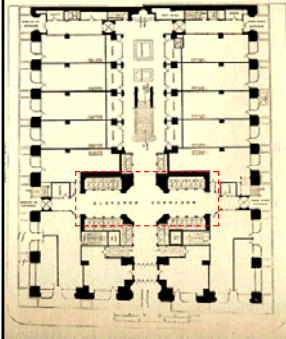


"...The elevator equipment, which is the most important part of the building, consists of twenty-nine Otis Electric Elevators. Of these, twenty-seven are for the use of the public, seven serving the tower, and twenty the main building. In addition, there is an automatic push-button elevator for the private use of the Irving National Bank, and an ash lift which runs from the sub-basement to the sidewalk..."

RE: excerpt from "The Master Builders"

Left: caption: "The Woolworth Building is equipped with 26 Otis Elevators. Two of them run from the First to the 51st Floor – 680 feet, the greatest distance served by any single Passenger Elevator. A Shuttle Elevator carries the visitors from the 51st to the 54th Floor, the Observation Station."

790

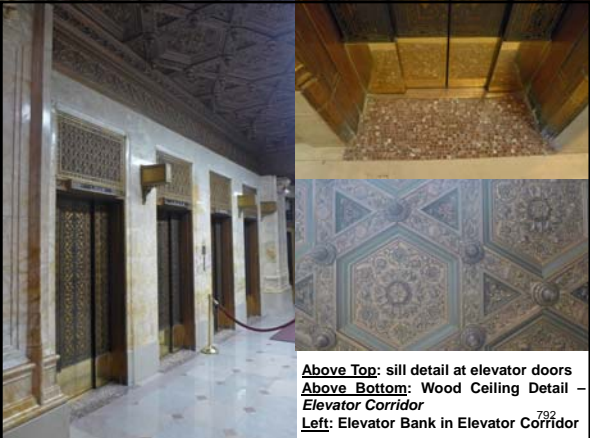


"...In the main part of the building, two of the elevators rise from the sub-basement to the twenty-seventh floor, twelve from the basement to the twenty-seventh floor, and four from the first floor to the twelfth floor. All are passenger elevators, with a maximum capacity of 3,000 pounds, and are designed to operate at a speed of 600 feet per minute with a load of 2,500 pounds. The other two main building elevators are combined passenger and freight machines which rise from the basement to the twenty-eighth floor, operating at a speed of 550 feet per minute with a load of 4,000 pounds. These also have an additional capacity of 6,000 pounds for lifting safes and other loads..."

RE: excerpt from "The Master Builders"

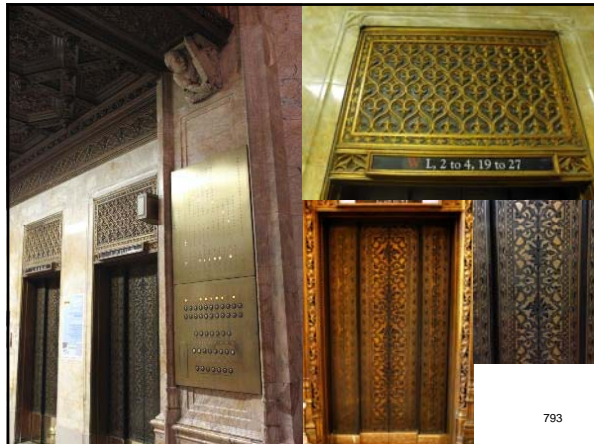
Left: elevator banks (plan)

791



Above Top: sill detail at elevator doors
Above Bottom: Wood Ceiling Detail – Elevator Corridor
Left: Elevator Bank in Elevator Corridor

792

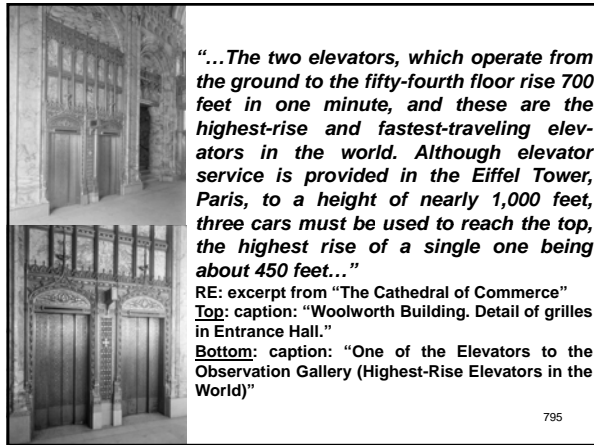


793



"...Of the seven elevators in the tower, two run to the fifty-third floor, two to the forty-seventh floor and two to the fortieth floor. These six elevators have a maximum capacity of 3,000 pounds, and are designed to operate at a speed of 700 feet per minute with a load of 2,500 pounds – the fastest service given by any electric passenger elevators in the world. One of the elevators which serves the fifty-fourth floor has an additional capacity of 6,000 pounds for lifting safes or other heavy loads. The seventh tower elevator is a shuttle, which carries passengers from the fifty-third floor to the observation station of the tower and runs at a speed of 200 feet per minute with a load of 1,500 pounds...The two elevators serving the fifty-third floor travel to a height of 670 feet 6 inches, which is the highest travel by any single passenger elevator in existence..." 794

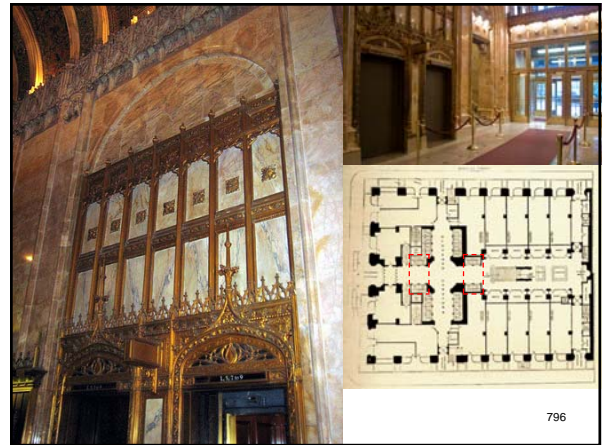
RE: excerpt from "The Master Builders"



"...The two elevators, which operate from the ground to the fifty-fourth floor rise 700 feet in one minute, and these are the highest-rise and fastest-traveling elevators in the world. Although elevator service is provided in the Eiffel Tower, Paris, to a height of nearly 1,000 feet, three cars must be used to reach the top, the highest rise of a single one being about 450 feet..."

RE: excerpt from "The Cathedral of Commerce"
 Top: caption: "Woolworth Building. Detail of grilles in Entrance Hall."
 Bottom: caption: "One of the Elevators to the Observation Gallery (Highest-Rise Elevators in the World)"

795

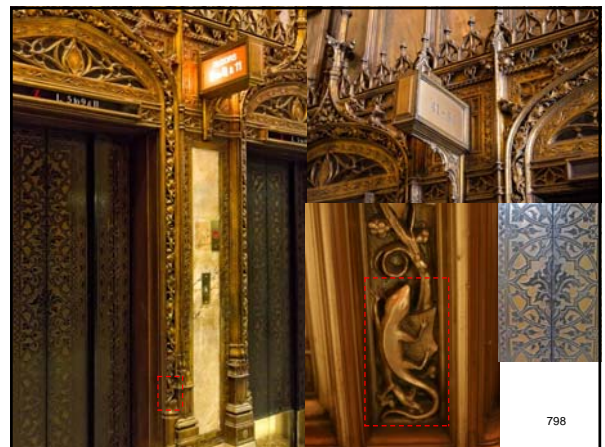


796



Above & Left:
 Arcade Elevator/s – Details


797



798

Safety First...

799



“...‘Safety first’ was the motto of the builders of this great structure, and in particular did this apply to the elevators. During the last few years accidents resulting in personal injury, due to faulty elevator mechanism, have been very rare. Nevertheless, every precaution was taken to make the Woolworth elevators absolutely safe. They were equipped with the most improved mechanical safety devices. All the shafts, too, were equipped with air cushions, which have been proved time and time again to be absolutely reliable. Not long ago, when severe tests were made, a car was allowed to fall from the twentieth story of the Empire Building in New York, and a basket of eggs which it contained was entirely uninjured when the car was checked in its downward flight by the air cushions...”

RE: excerpt from “The Master Builders” 800
Left: caption: “Empire Building, NYC”

“...On account of the complex elevator problem and the high speed at which service is maintained, together with the fact that nearly 30,000 people daily travel upon these elevators (more than 9,000,000 a year), particular attention was given to the matter of safety devices. The more important of these are the under-car safety operated by a governor placed over-head; oil buffers placed under each car and counterweight; retarding and latching device at the top of each shaftway; limit switches at the bottom and top of travel; speed governor and potential switches operated by governor; switch attached to safety plank on the under-car safety; emergency wheel and safety switch inside the car itself. Besides these, the gearless traction elevator has the great inherent safety feature because, if either the car or counterweight over-travels, the tractive force is lost, owing to the weight of the car or counterweight being removed from the hoisting cables. There are also many electrical safety devices which form a part of the controlling equipment safeguarding the operation of these elevators...”

RE: excerpt from “The Cathedral of Commerce”

801

“...Two additional features of great importance among the safety devices are the emergency exit doors and the interlocking devices on the shaftway doors. The emergency exit doors are so constructed that, in the event of an elevator being accidentally held between floors, passengers may be transferred to an adjoining elevator and carried safely to their destinations without delay or confusion. The interlocking device on the shaftway doors effectively overcomes one of the common causes of elevator accidents, namely, those which occur as passengers enter or alight from elevators. These accidents may usually be charged to the carelessness of the operator in opening the shaftway door before the elevator reaches a full stop or starting the elevator before the door is fully closed. In this Building, elevators cannot be so operated because the interlocking device absolutely prevents an elevator from moving until the shaftway doors are fully closed...”

RE: excerpt from “The Cathedral of Commerce”

802

“...All the elevators are equipped with a complete system of safety devices, and including air cushions which will bring the cars gradually to rest at the bottom of the hatchways, in case of a drop even from the top of the shaft...”

RE: excerpt from “The Master Builders”

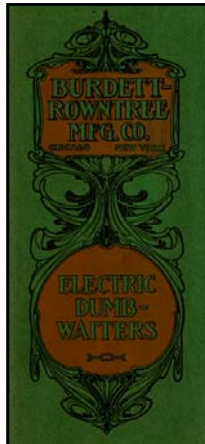
803



“...Besides the regular safety devices enumerated above, Mr. Woolworth ordered air cushions for all elevators. These consist of a heavy steel structure enclosing each elevator shaft separately with reinforced concrete placed between I-beams. In addition, the interior of the shafts is lined with heavy steel plates, and as a car enters the air-cushion zone and approaches the bottom of travel the air pressure underneath increases. Therefore if all safety devices fail to operate and the car dropped, the air would be so rapidly compressed that it would not have time to escape through the automatic valves or through the clearance space around the elevator; hence, the speed of the latter would be retarded and the car brought gradually to rest at the base of its shaftway without injury or shock to passengers within...”

RE: excerpt from “The Cathedral of Commerce”

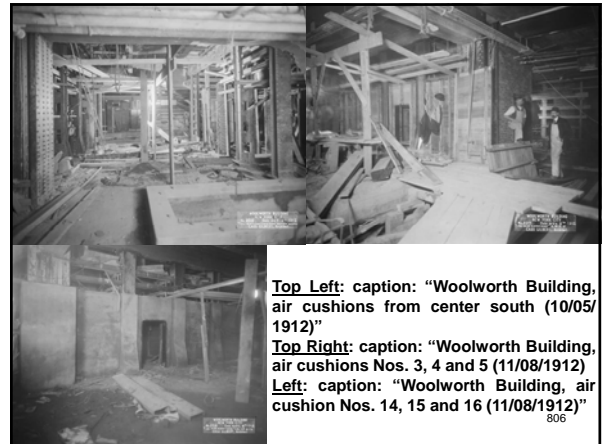
Left: caption: “Woolworth Building, air cushion Nos.15, 16, 17 and 18” 804



"...As this was the first time that air cushions were to be used on elevators traveling fifty or more stories, every precaution was naturally taken to make them perfect. The air cushion being approximately one-fifth of the height of the shaft, it meant that the enclosure doors on the lower eleven floors of the high rise elevators would have to be heavy enough to withstand the air pressure developed in case the car fell from the top. As manual operation of these doors was out of the question on account of the weight, the architect asked the Burdett-Rowntree Manufacturing Company to solve the problem, believing that their broad experience in equipping all types and weights of sliding and lifting elevator doors with pneumatic operating devices would guarantee the successful solution..."

RE: excerpt from "The Master Builders"

805



Top Left: caption: "Woolworth Building, air cushions from center south (10/05/1912)"

Top Right: caption: "Woolworth Building, air cushions Nos. 3, 4 and 5 (11/08/1912)"

Left: caption: "Woolworth Building, air cushion Nos. 14, 15 and 16 (11/08/1912)"

806

"...To determine the utility of the air cushions, a test was made by loading an elevator with 7,000 pounds of material and dropping it from the forty-fifth floor with all safety devices and cables removed. When this elevator reached bottom, its load was unharmed; the vibration being so slight that even a glass of water, which it carried, remained intact..."

RE: excerpt from "The Cathedral of Commerce"

807

"...Tests were made and a special pneumatic device manufactured, and the satisfactory manner in which all the one hundred and twenty-four air cushion doors are operating is evidence of good reasoning in selecting the Burdett-Rowntree manufacturing Company for this part of the work. To reduce the cost of maintenance of the operating devices so far as possible, this company installed an automatic lubricating system whereby all the devices are lubricated through the medium of the air from one point. The Architect desired that the Burdett-Rowntree Manufacturing Company should assume the responsibility for as much as possible of the working of the air cushion doors, and therefore, in addition to the pneumatic door operating devices, they manufactured and installed the special door hangers and adjustable interlock switches and hung all of the air cushion doors..."

RE: excerpt from "The Master Builders"

808

ROEBLING'S WIRE ROPE

For Sale
IRON or STEEL WIRE HOISTING, RUNNING or STANDING ROPE, or BEST GALVANIZED CHARCOAL WIRE ROPES FOR SHIP'S RIGGING.
Address, JNO. A. ROEBLING'S SONS, Manufacturers, Trenton, N. J., or 117 Liberty St., N. Y.
Wires and Ropes for transmitting power long distances. Sold for Circular and Parallel.

Standard Coarse Laid Rope
For Haulages and Transmissions
Composed of 6 Strands and a Hemp Center,
7 Wires to the Strand
"Blue Center" Steel

"...Daily inspections are made by the Building's maintenance force, not only of this apparatus but of everything else affecting the safety, comfort and welfare of tenants and the general public. To show the extreme caution of these inspectors, a remarkable test was made in the plant of John A. Roebling's Sons Co. with a set of six hoisting cables condemned and taken from an elevator after three years of active service. The one most worn of these cables was placed upon a powerful testing machine to determine the weight it would sustain before pulling apart. It broke only after assuming a burden of 16,600 pounds; hence the total carrying strength of the six condemned cables was at least 99,600 pounds. As the maximum weight of an elevator and its passengers is about 6,000 pounds, it will be seen that these cables were, by actual test, still strong enough to safely handle sixteen times the maximum weight of a loaded elevator..."

809

RE: excerpt from "The Cathedral of Commerce"

Left: designed by Charles G. Roebling (1849-1918), engineer and president of JARS Co. (1876 to 1918), this was the largest wire-rope closing machine of its day. The machine, built in 1893, twisted six strands around a central core rope. These seven combined in the machine's forming die to produce a finished wire-rope, a process known as closing. The machine was built to produce 1.5-inch rope for cable railways (80-tons could be loaded at a single spinning providing 30K-feet of un-spliced cable). The demand for ever longer cable-car ropes led to its design. It was a vertical machine, standing 64-feet high, requiring the machine and building to be built as a unit. Such wire-rope would be used for a myriad of industrial activities, including the elevator cables serving the Woolworth Building.

810

...and Always

811

"... 'Safety first' and always is the watchword in the operation of this vertical railway system. While the cars travel at great speed, the maintenance is so closely watched and cared for that they move along almost unnoticed – no quivering, no vibration, no sound whatever, absolute smoothness and safety..."

RE: excerpt from "The Cathedral of Commerce"

812

The Best Elevator Service Possible

813

"...Owing to the arrangement of the elevators, the severe service to which they are subjected, and the variations in the height of travel, it was necessary to provide special means of controlling the operators and the movement of the elevators themselves. A Dispatcher System was therefore devised and used in this Building for the first time. This system consists of a dispatch board and a signal board with electric flashlights to indicate the movement and location of every elevator. The dispatcher absolutely controls the elevators and is prepared, by means of telephonic communication, to pass instructions to the operators when necessary, regardless of whether the elevators are in motion or at rest, so as to correct immediately any irregularities in the service. Incidentally, the telephone in each elevator, while primarily a part of an interior system designed to bring about the greatest efficiency in operating, is also connected with the great Bell telephone system directly through the Telephone Company's central office, so that one may communicate by telephone with any part of the United States from a moving elevator in the Woolworth Building...Eighteen hundred telephones are in service throughout the Building, a greater number than is used in a city of 30,000 inhabitants. The average daily traffic is 29,000 calls, totaling 8,700,000 messages per year..."

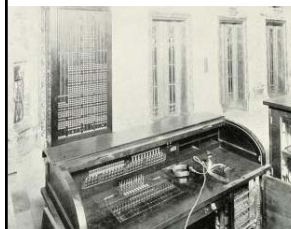
RE: excerpt from "The Cathedral of Commerce"

814

"...Automatic starting signals are placed at the terminal landings and a buzzer signal is fixed in each car. In order that the dispatcher may communicate with the operator, telephones have been provided. These are so arranged that they may be operated from either end of the line, or from the dispatching room only. The telephone instrument in the car is provided with a loud-speaking transmitter which magnifies the voice tones and enables the operator to receive telephoned instruction while the car is in operation..."

RE: excerpt from "The Master Builders"

815



"...The dispatcher is located in an isolated room, and by means of a position indicator is able to follow the progress of each elevator in the building. These indicators consist of a series of miniature lamps corresponding to the different floors served by each elevator, and as a car reaches a floor the fact is known to the dispatcher by the lighting of the corresponding lamp..."

RE: excerpt from "The Master Builders"

Left: caption: "Dispatcher System"

816

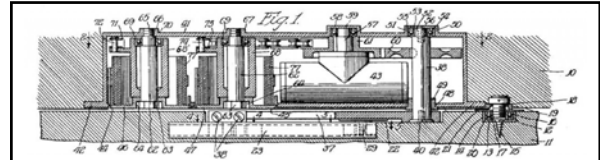


“...The public signals consist of the Armstrong Full Flash Type, having the up and down lamps at each floor. In addition to these, for each group of elevators, there is an electric sign to indicate the character of the service, whether express or local, and the floors which are being served. These signs are operated electrically and can be controlled and changed from the dispatcher’s station...”

RE: excerpt from “The Master Builders”

Left: caption: “Up-Down Indicator”

817

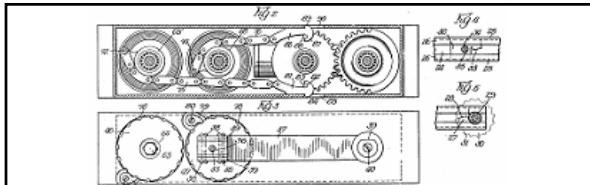


“...The large number of high-speed elevators in the Woolworth Building, while a fundamental necessity, by no means solve in themselves the problems involved, and they fall short of the duty demanded of them but for the elaborate system of elevator signals and auxiliary devices provided after careful study and experiment by the architect, consulting engineers and contractor. The results attained are perfect elevator service, controlled from one central station instead of through several starters stationed at different points on the ground floor, efficient and economical operation of the elevators through the system of signals and signs whereby false stops are eliminated and delay in waiting for passengers at the floors is avoided; absolute safety to passengers ensured, whether entering or leaving the elevators, through the installation of the Norton device, which automatically closes and locks the doors and prevents all movement of the car until the door is closed. The signals and various devices through which these results are accomplished may be mentioned briefly, as follows...”

RE: excerpt from “The Master Builders”

Above: caption: “L.C. Norton – Door Closing and Checking Device”

818



“...The records of the liability companies show that eighty-five per cent of all accidents to the public in connection with elevator service are what they classify as ‘door accidents,’ or those due to unlocked doors or which occur while the passengers are attempting to board or leave the elevators. The elevators in the Woolworth Building are equipped with the Norton Elevator Door Closer, a device that absolutely prevents the possibility of accidents of the class cited. With this device the door is opened manually by the operator in the usual manner; when released, it closes automatically, without noise and locks. By an electric switch arrangement the controlling circuit of the elevator is broken while the door is open, and all motion of the car is automatically and positively prevented until the door is closed. Carelessness or confusion on the operator’s part is thus rendered harmless to the safety of the passenger...”

RE: excerpt from “The Master Builders”

Above: caption: “L.C. Norton – Door Closing and Checking Device”

819



“...The passenger elevators, twenty-four in number, are equipped throughout with the Armstrong Flashlight Signal System, embracing the usual ‘Up Down’ lanterns at the floors, through which the waiting passenger is directed promptly to the first approaching car. ‘Up Down’ push buttons at the floors, whereby the operator is given timely signal to stop, and which signal is automatically carried to the next car in the event of his inability to stop by reason of a ‘full car’ or other cause. Signals of special design are provided for two high-rise cars for night service. Directional signs are also provided, designating the travel of the elevators and showing plainly to the public their travel in respect to express or local service. The elevators are also equipped with illuminated ‘thresholds,’ a valuable factor of safety inasmuch as the passenger is enabled to see clearly where he is stepping when entering the car and is not liable to stumble...”

RE: excerpt from “The Master Builders”

Left: caption: “Original (ca. 1911) ornamental cast bronze gothic style elevator cab floor indicator push button plaque or backplate”

820

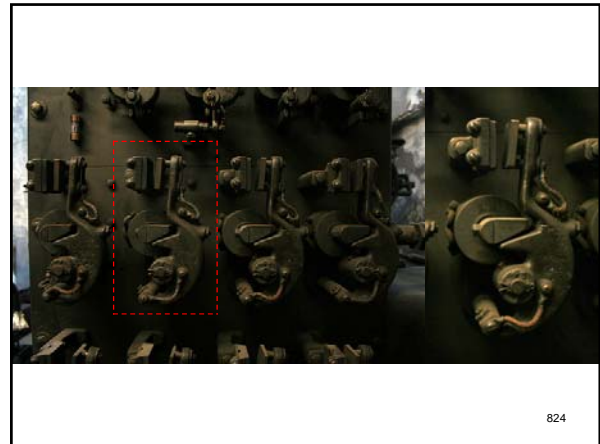


821

“...All the elevators are controlled, as has been mentioned, from one central station. This dispatcher’s station is located on the main floor balcony and is provided with a Position Indicator Lamp Board showing by miniature lamps the exact position of all the cars; a telephone system extending to all the cars and establishing communication between the dispatcher and operators at all times and regardless of the position of the car; motor-driven Automatic Timing Devices, ringing bells and buzzers at the top and bottom of the elevator hatchways for starting the cars at predetermined intervals; motor generators, storage batteries, and equipment complete in every detail for the control of all the cars by one dispatcher...”

RE: excerpt from “The Master Builders”

822



Part 9

As Nearly Perfect as Possible

826

Sanitary & Otherwise

827

“...Under present day conditions of living there is no part of a building more important than the plumbing and water supply system. In fact there is nothing of equal importance, for in the final analysis, a building without a water and plumbing supply system is useless. In beauty and stateliness of design a building may express the highest order of genius in architecture; in strength and in appliances for safety and convenience it may represent the last word in the science of mechanical engineering, in construction it may be an example of the highest skill in all crafts; but, it will stand a useless pile of brick and stone and iron entirely uninhabitable, without an adequate water and plumbing system...”
 RE: excerpt from “The Master Builders” 828

"...The plumbing work, water supply and drainage system was installed by the W.G. Cornell Company, New York, Boston, Baltimore and Washington, and represents the most modern appliances and expert workmanship. There are approximately forty-three miles of pipe and two thousand plumbing fixtures in the building, and many novel but practical ideas were employed to make the water supply system and apparatus as substantial and useful as the building itself..."

RE: excerpt from "The Master Builders"

829

"...The rain-water drainage system is entirely separate from sewage drains, thereby preventing overflows and flooding of the building in case of stoppage of any of the pipes. A system of house supply tanks on different levels, each supplying a certain number of floors, equalizes the water pressure at the fixture outlets and prevents excessive pressure at any one point. The house supply tanks are located on the fourteenth, twenty-seventh, thirty-seventh, fifty-third and fifty-sixth floors and are in duplicate. The water-closets and urinals are supplied from the house tanks and pumps on a system entirely separate from the tanks and pumps which supply the other plumbing fixtures. There are separate water supply connections from the city mains in the streets on the three sides of the building; also a separate supply of water at all times. In case any one or any two mains in the street are shut off by the Water Department there is still a plentiful supply of water..."

RE: excerpt from "The Master Builders"

830



"...The total storage capacity of the thirteen tanks in the building is 88,000 gallons, all which is available in case of fire. The water in the swimming pool, about 42,000 gallons, is also available for fire purposes, having a connection from the fire-pump direct to the pool, which can be used in case of emergency..."

RE: excerpt from "The Master Builders"

Top: caption: "Woolworth Building, pump room"
Bottom: caption: "Woolworth Building, swimming tank"

831

"...Special arrangements allow for the expansion and contraction of all pipes and other unforeseen emergencies. Separate drains from the kitchen fixtures keep grease out of the general drainage system. There is a special arrangement of alarm bells to inform the engineers when the house tanks are empty or full. There are six fire-hose outlets, with 400 feet of hose and valve on each floor in the fire standpipe system. In the basement there is a large swimming pool supplied with filtered water, showers and other up-to-date bathing appliances. There is a hot-water heater for pool duty alone and another one for the shower alone, thus insuring water at proper temperature for both. The bathing establishment has its own independent system of filters. The plumbing fixtures are of 'vitreous' ware and porcelain, and the toilet rooms are wainscoted with Carrara glass to a height of eight feet, so that the sanitary conditions are as nearly perfect as possible..."

RE: excerpt from "The Master Builders"

832

Talking Point

833

"...A system of double water filters of ample size and capacity filters effectively all water used. There are five water pumps to supply the house and fire tanks and, in addition, one 20X0X18 fire pump, which is guaranteed to deliver 500 gallons of water a minute at the topmost point of the tower, or approximately, eight hundred feet above the pump room. Twelve hot-water heaters and their piping are so arranged as to divide the hot-water supply for plumbing fixtures into sections, thereby equalizing the pressure and flow at the faucets and insuring hot water in abundance at all times...A duplicate sewage and ejector plant, operated by compressed air, controls the plumbing fixtures which are located below the level of the public sewer in the street...Philips & Worthington during the course of construction of the building drilled an 8-inch diameter well to a depth of 1,538 feet below curb, and installed an 8-inch diameter driven or screen well in the water-bearing sand and gravel above the rock. This well is designed to serve a double purpose. It may be used for a water supply or to lower the ground water level at any time, thereby insuring a perfectly dry cellar..."

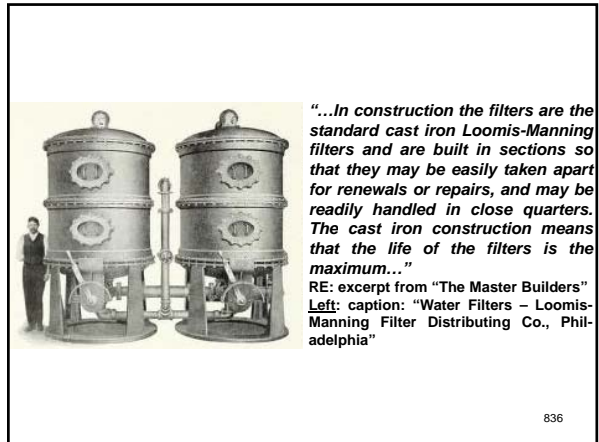
RE: excerpt from "The Master Builders"

834

"...The entire water supply of this great building is made clean and safe for all uses by Loomis-Manning Filters. The filter plant is divided into two or three parts, each supplying certain sections of the building. An unusual feature is the installation of two large filters to filter the wash water from the other filters of the plant. This cleansed wash water is discharged into a tank and used for flushing and other similar purposes. The swimming pool is provided with two large double cylinder filters to make the water attractive and safe. The filters themselves, with the exception of those for filtering the wash water, are all of double cylinder type, providing double filtration and making it certain that the water shall not only be clean and safe, but free from any odor or taste that may be present in the 'raw' water at any time..."

RE: excerpt from "The Master Builders"

835



"...In construction the filters are the standard cast iron Loomis-Manning filters and are built in sections so that they may be easily taken apart for renewals or repairs, and may be readily handled in close quarters. The cast iron construction means that the life of the filters is the maximum..."

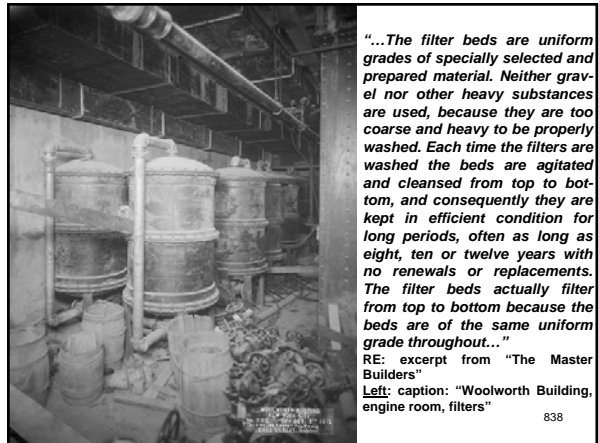
RE: excerpt from "The Master Builders"
Left: caption: "Water Filters - Loomis-Manning Filter Distributing Co., Philadelphia"

836

"...Each filter cylinder is equipped with a solid bronze Manning Single Controlling Valve, so that it may be easily and accurately operated and controlled. The movement of the one lever operating this valve causes the filter to be flushed and cleaned from all the impurities that have accumulated and this is done with the greatest ease and the least waste of water on account of the accurate control and the sight glass on the waste line through which the cleansing process is watched. These filters are built so that none of the filtering material can escape either with the filtered water into pumps, house lines, etc., or out through the waste when the filter is being washed..."

RE: excerpt from "The Master Builders"

837



"...The filter beds are uniform grades of specially selected and prepared material. Neither gravel nor other heavy substances are used, because they are too coarse and heavy to be properly washed. Each time the filters are washed the beds are agitated and cleansed from top to bottom, and consequently they are kept in efficient condition for long periods, often as long as eight, ten or twelve years with no renewals or replacements. The filter beds actually filter from top to bottom because the beds are of the same uniform grade throughout..."

RE: excerpt from "The Master Builders"

Left: caption: "Woolworth Building, engine room, filters"

838

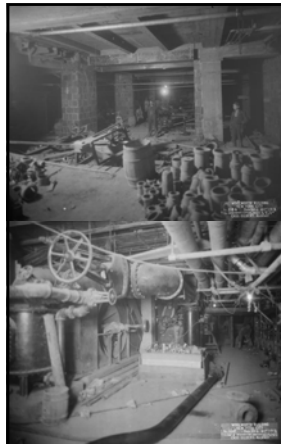
"...Regarding the value of clean, safe water in such a building, it is well to consider for a moment the expense that would be caused by mud gradually clogging pipes, if the water were unfiltered; the extra janitor force required to keep handsome plumbing fixtures bright and clean, if the water were dirty, the washers and faucets that would be cut if there were grit in the water, besides the extra cleaning and coal consumption caused by mud scale in the boilers. Undoubtedly, clean, safe water adds greatly in making a building attractive to tenants or prospective tenants. Moreover the filter plant of the Woolworth is a safeguard to the great mechanical and plumbing equipment of the building; it is a good 'talking point' in renting the offices because it ensures the tenants water which they must delight in using...All these points combine to produce a filter plant which is durable and lasting, is operated with the least expenditure of time and consumption of water for washing, and is thoroughly efficient in operation. In short, it is a plant which is in conformity with the high standard of this splendid building..."

RE: excerpt from "The Master Builders"

839

Of Great Importance

840



"...The plumbing system is dependent on the pipe which carries the water to and drains it from the system. Hence the quality of the pipe is of great importance. Pipe of inferior quality deteriorates quite rapidly and very soon becomes not only a cause of continual expense for repairs, but also under some conditions, a menace to health...All the drain pipes are made of extra heavy galvanized wrought iron, with galvanized malleable, screwed, drainage fittings. The pump discharge pipes and fire standpipes are of extra heavy, galvanized, malleable hydraulic fittings. The hot-water piping and inaccessible cold-water supply piping is of annealed brass. The best materials were used because strength and durability as well as usefulness were the first considerations..."

RE: excerpt from "The Master Builders"

Top: caption: "Pipe awaiting installation in sub-basement"

Bottom: caption: "Valve and pipes installed in sub-basement" 841

HOW THE WATER POURED FROM WOOLWORTH BUILDING



"...All the pipe was furnished by E.F. Keating Company, New York, and it is the best that can be made. It is strictly genuine wrought iron, all made from straight pig muck-bar, and all sizes larger than 1 1/4 inches were made lap-welded. All this pipe is galvanized. The soil, vent, leader and low pressure lines of extra heavy. Before being delivered to the building, each and every length was subjected to a hydrostatic pressure, the standard to 1,000 pounds and the extra heavy to 1,500 pounds per square inch. After being cut, fitted and installed in position, it was again subjected to pressure tests. In the case of the stand pipes for fire protection, this test was at the greatest pressure which fire pumps could develop, this forced the water through these stand pipes high above the top of the building, which is about 850 feet in height. Notwithstanding this series of very severe tests, not a single length of pipe gave way, not a joint leaked, and there are more than 40 miles of pipe..."

RE: excerpt from "The Master Builders"

Left: caption: "Water Spouting from Top of the Woolworth Bldg. in Standpipe Test" 842

In Case of Fire

843

"...Although it would seem impossible that a fire should ever occur in a building constructed altogether of non-flammable materials, it sometimes happens that tenants accidentally set fire to their papers or anything else of an inflammable nature which is their particular office. To provide adequately for such emergencies six standpipes, each six inches in diameter, are located conveniently in the stair, towers and corridors. They are so arranged that any point of any floor may be reached with a 75-foot length of hose pipe, which has a 1-inch standard nozzle. Four of the standpipes are located on the thirtieth floor, one on the thirty-fourth floor and one continued to the top of the tower, but hose connections to them are on every floor. Upon the roof of the main building Siamese hose connections are placed one to each riser, and these continue up to each wing. Supply tanks of 6,200 gallons capacity are located on the fourteenth floor, three tanks of 20,000 gallons capacity on the twenty-sixth floor, 3,100 gallons on the thirty-seventh floor, 9,900 gallons on the fiftieth floor, and 1,200 gallons on the fifty-third floor..."

RE: excerpt from "The Master Builders" 844

The Power to Serve

845



"...The electrical energy for the lights, elevators and miscellaneous motors is furnished by two 500-, one 300- and one 200-kilowatt direct current generators connected to four Rice & Sargent horizontal, tandem compound, non-condensing engines as designed and built by the Providence Engineering Works, Providence, R.I., the exhaust steam being used to heat the building during the heating season. The engines are of the Corliss or releasing gear type with unique valve gear construction. The wrist plate so common to the Corliss type of engine is dispensed with and a straight line motion substituted which operates the valves direct from the eccentrics..."

RE: excerpt from "The Master Builders"

Left T&B: caption: "Rice-Sargent Engines" 846

“...The engines operate on a combined power and lighting load without the medium of storage batteries; the flexibility of the governor and valve gear compensating for the large fluctuations in the load due to the elevators. An automatic safety stop motion, whose operation is independent of the governor, is provided and also arranged for electric control from remote stations to shut down the engines in case of emergency...”

RE: excerpt from “The Master Builders”

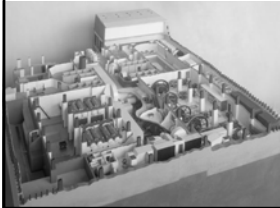
847

“...The engine foundations are isolated from each other and from the structural work of the main building. While the engines are in perfect balance this measure is a precautionary one only, and is done to eliminate all chances of vibration. Steam is supplied to the cylinders from below the floor, rendering unnecessary overhead piping with its accompanying disadvantages as well as disfigurement of the engine room. In a power plant of this kind reliability is the chief requisite, along with economy, efficiency, very close regulation and operation free from noise and vibration...”

RE: excerpt from “The Master Builders”

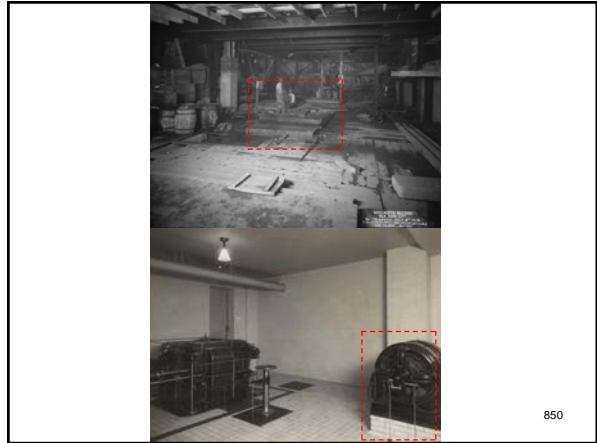
848

“...To eliminate all possibilities of vibration from the massive motor pumps, ventilators and other machinery with which the Woolworth Building is equipped the architect specified a solid even stone foundation. This important detail of the construction demanded special attention owing to the gigantic proportions of the building and the consequent massiveness of the machinery and the resulting vibration. The advantages of a stone foundation for machinery, separate and distinct from the building foundations, being universally recognized, the only consideration was the choice of the contractor. To John Best of New York City was awarded the contract...The contract called for approximately 200 caps for the motors, pumps, ventilators, fans and other machinery. The largest of these caps or stone beds was thirteen feet three inches by four feet three inches by six inches; the total number of holes bored was six hundred. Caps were also supplied to hold the machinery in place. Mr. Best had the huge blocks of stone brought from the Portageville quarries in New York State. The stone beds were built and no holes had to be rebored. The work was highly satisfactory and the stone beds are as firm as the foundation of the building itself...”



RE: excerpt from “The Master Builders”
Left: caption: “Model of Woolworth Building Engine Room”

849

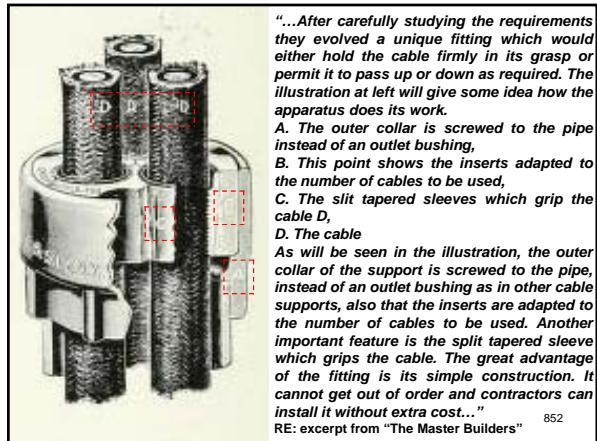


850

“...The cables of copper wires extending from the basement of the Woolworth Building to the top floor and wherever lighting is necessary were unusually heavy, and special fittings to hold them and allow of their being firmly held, or allowed to be carried along if necessary without the possibility of slipping, had to be designed and made specially. The electric wiring was, of course, in proficient hands and when the necessity of special fittings which would grip the cable at will was evident, the situation was outlined to Russell & Stoll, designers and manufacturers of electrical fittings and fixtures, of Cliff Street, New York City...”

RE: excerpt from “The Master Builders.” Thomas Edison’s electric lighting company was “allowed” to provide the electrical lighting for the Woolworth Building, albeit at their own expense. Their reward would be advertisements declaring that they had been chosen to illuminate the “World’s Tallest Building.”

851



“...After carefully studying the requirements they evolved a unique fitting which would either hold the cable firmly in its grasp or permit it to pass up or down as required. The illustration at left will give some idea how the apparatus does its work.

- A. The outer collar is screwed to the pipe instead of an outlet bushing,
- B. This point shows the inserts adapted to the number of cables to be used,
- C. The slit tapered sleeves which grip the cable D,
- D. The cable

As will be seen in the illustration, the outer collar of the support is screwed to the pipe, instead of an outlet bushing as in other cable supports, also that the inserts are adapted to the number of cables to be used. Another important feature is the split tapered sleeve which grips the cable. The great advantage of the fitting is its simple construction. It cannot get out of order and contractors can install it without extra cost...”

RE: excerpt from “The Master Builders”

852

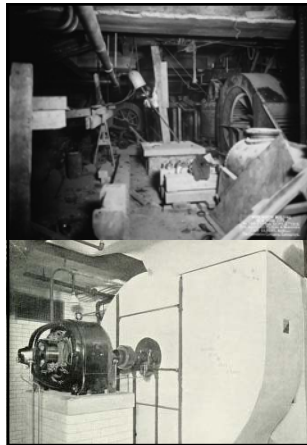
Heating & Ventilating

853

"...The heating and ventilating plant in the Woolworth Building was built in accordance with plans and specifications prepared by the well-known firm of consulting engineers, Nygren, Tenny & Ohmes. Heating and ventilation is their special field of work, and the unusual requirements of the great Woolworth Building made special demands upon their resources and skill. Their plans were undoubtedly made with great care and precision, and executed under their supervision to the entire satisfaction of architect, contractors, owners and all interested..."

RE: excerpt from "The Master Builders"

854



"...The earliest installations of types of motors originally applied to fans and blowers as the 'Commercial Field' and 'Armature Control,' have been succeeded by the 'All Field Control' motors, the type installed in the Woolworth Building. These are manufactured by the C&C Electric and Manufacturing Company, of Garwood, N.J. They represent the most reliable and economical design for the purpose of driving fans and blowers in connection with indirect heating systems..."

RE: excerpt from "The Master Builders"

Top: caption: "Woolworth Building, feed-water filters and blowers"
Bottom: caption: "Ventilation System - C&C Electric & Mfg. Co." 855

"...There are nineteen C&C electric motors installed in the building, directly connected with the fans. The motors were specially built for the Woolworth, and a most important feature is that both the motors and the entire apparatus connected with them are absolutely noiseless in action. It must be conceded that 'quiet' is as essential in business offices as ventilation. The electric motor made possible and practicable the installation of blowers and fans in a number of locations throughout the building up to the forty-sixth floor, and these are doing excellent work in supplying fresh air to the building every day of the year; and not withstanding the number of fittings and accessories the work is done silently. Like all good human workers they do their work well and make no noise about it. It is only fair to say that ever since the inception of mechanical ventilation, the C&C motors have been identified with every advance made by steam heating engineers in work of this character..."

RE: excerpt from "The Master Builders"

856

Reveling in Pure Air

857

"...The forethought of the owner and builders of the Woolworth on behalf of tenants and their comfort and health cannot well be overestimated. Progenitors of new buildings in the future will find great difficulty in conceiving new ways of winning the paying approval of prospective tenants. Think of ensuring pure air in modern office buildings during the humid summer months, when breezes are rare, and again, in the months of frost and snow, when heaters generally take the vitality from the atmosphere, and to obtain pure air it has been necessary to risk a season of grip or influenza. The upper rooms of the Woolworth Building are reveling in pure air. Ventilators may modify the temperature at will, and radiators are arranged to warm without destroying the life-giving qualities of oxygen and hydrogen. The rooms below the surface of Broadway, Park Place and Barclay Street, where Boreas never enters - neither does a mild breeze - also have pure air in abundance. Fans are excellent and make life pleasant sometimes, but they do not meet all requirements, especially in winter..."

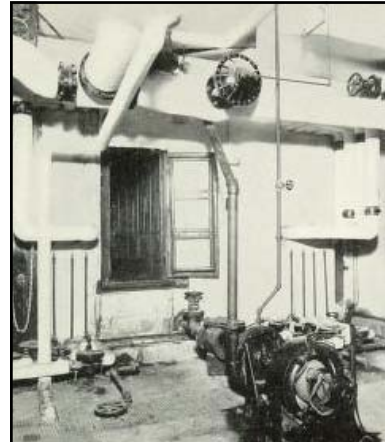
RE: excerpt from "The Master Builders"

858

"...The air is first received from the outside, drawn through water, discharged into the air in an atomized condition through 'Kinealy' patented spray heads, and then drawn into what are called 'eliminator' plates, which separate the air from the water. After leaving the eliminator plates, the air is free from all entrained moisture and delivered to the rooms, in the winter time heating and purifying, and in the summer cooling and purifying. During the summer the air in the different rooms is cooled to about twenty degrees below the outside temperature. The air is also delivered into the rooms with the proper percentage of humidity, which makes the rooms habitable. The water used in connection with this apparatus is re-circulated by centrifugal pumps, which make the apparatus inexpensive in operation as regards the water consumption..."

RE: excerpt from "The Master Builders"

859



"...The Kauffman Heating and Engineering Company has met the difficulty in the Woolworth Building, and the rathskeller, engine room, barber shop and banking rooms are receiving purified 'washed' air through the 'Kinealy' air washers which this company has installed. The 'Kinealy' air washers purify and cool all the air delivered wherever installed..."

RE: excerpt from "The Master Builders"
 Left: caption: "Kinealy' Air Washers - Kauffman Heating and Engineering Company" 860

"...The 'Kinealy' apparatus was selected by the engineers and architects after rigid inspection and tests. By the use of the 'Kinealy' air purifiers the engineers were able to supply the upper rooms with purified; otherwise it would have been impossible to install a perfect ventilating system in the building, owing to the great amount of dust and foreign particles discharged into the rooms through the fans..."

RE: excerpt from "The Master Builders"

861

The Bowser System

862

BOWSER

LUBRICATORS-OIL FILTERS-OILING SYSTEMS-ACCESSORIES
 OIL STORAGE AND DISTRIBUTION SYSTEMS
 "STANDARD UNITS INDIVIDUALLY ENGINEERED"

S.F.BOWSER & COMPANY, Inc.
 LUBRICATION ENGINEERS AND MANUFACTURERS
 FORT WAYNE, INDIANA, U.S.A.

"...In asking S.F. Bowser & Company, of Fort Wayne, Indiana, to design their oiling system, the builders of the Woolworth recognized that they were experts on the question of lubrication, and understood that the successful bidders must design and erect a system which they knew to be efficient; that not only one engine, but the entire plant, must automatically and exactly be given the oil it requires, and at the same time be free from complicated mechanism which would necessarily involve a great deal of mechanical supervision..."

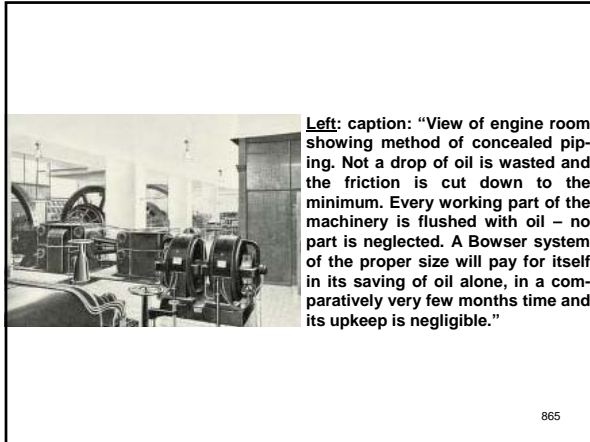
RE: excerpt from "The Master Builders"

863

"...To meet these specifications a complete 'Bowser' Gravity Oil Filtering and Circulating System was installed. All engine and cylinder oils are fed to moving parts in quantities large enough to reduce friction to the minimum, and at the same time to collect, purify and return the oil so that it can be used over and over again without loss and without injury to the finest and most delicate machinery. Covered by the 'Bowser' Engine Oil Lubricating System, there are four cross-compound engines, four balancer sets, one refrigerating machine and nine ventilating fans. The cylinder oil system, besides the engine and refrigerating machinery, takes care of twenty-four pumps..."

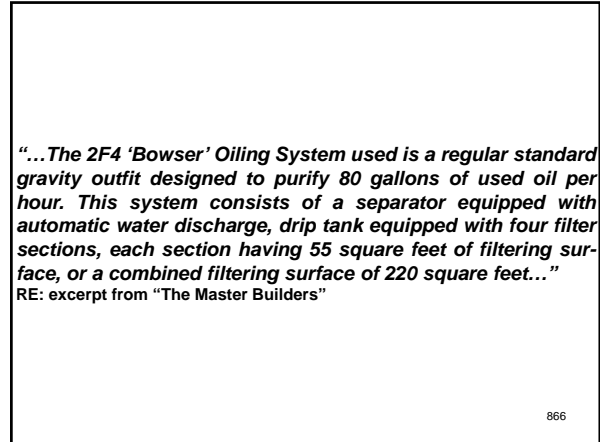
RE: excerpt from "The Master Builders"

864



Left: caption: "View of engine room showing method of concealed piping. Not a drop of oil is wasted and the friction is cut down to the minimum. Every working part of the machinery is flushed with oil – no part is neglected. A Bowser system of the proper size will pay for itself in its saving of oil alone, in a comparatively very few months time and its upkeep is negligible."

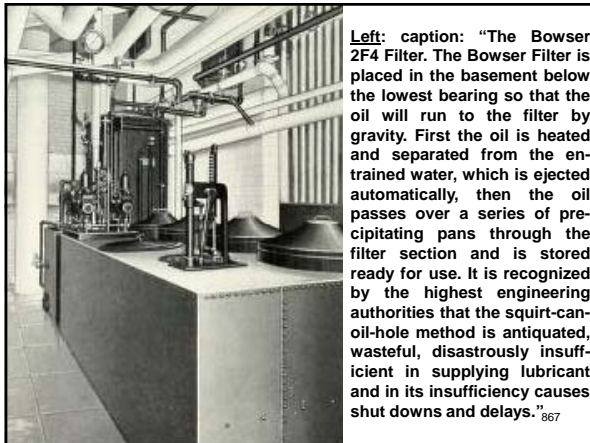
865



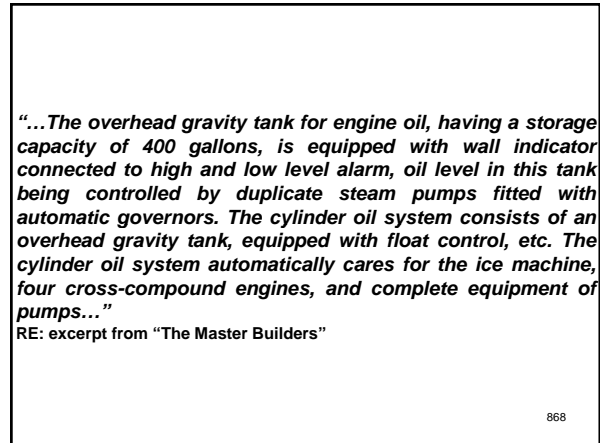
"...The 2F4 'Bowser' Oiling System used is a regular standard gravity outfit designed to purify 80 gallons of used oil per hour. This system consists of a separator equipped with automatic water discharge, drip tank equipped with four filter sections, each section having 55 square feet of filtering surface, or a combined filtering surface of 220 square feet..."

RE: excerpt from "The Master Builders"

866



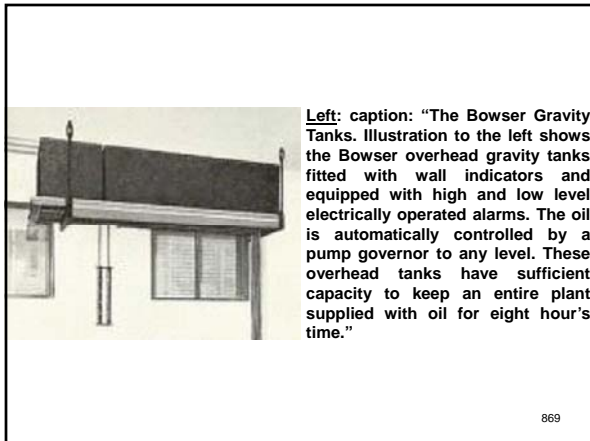
Left: caption: "The Bowser 2F4 Filter. The Bowser Filter is placed in the basement below the lowest bearing so that the oil will run to the filter by gravity. First the oil is heated and separated from the entrained water, which is ejected automatically, then the oil passes over a series of precipitating pans through the filter section and is stored ready for use. It is recognized by the highest engineering authorities that the squirt-can-oil-hole method is antiquated, wasteful, disastrously insufficient in supplying lubricant and in its insufficiency causes shut downs and delays."⁸⁶⁷



"...The overhead gravity tank for engine oil, having a storage capacity of 400 gallons, is equipped with wall indicator connected to high and low level alarm, oil level in this tank being controlled by duplicate steam pumps fitted with automatic governors. The cylinder oil system consists of an overhead gravity tank, equipped with float control, etc. The cylinder oil system automatically cares for the ice machine, four cross-compound engines, and complete equipment of pumps..."

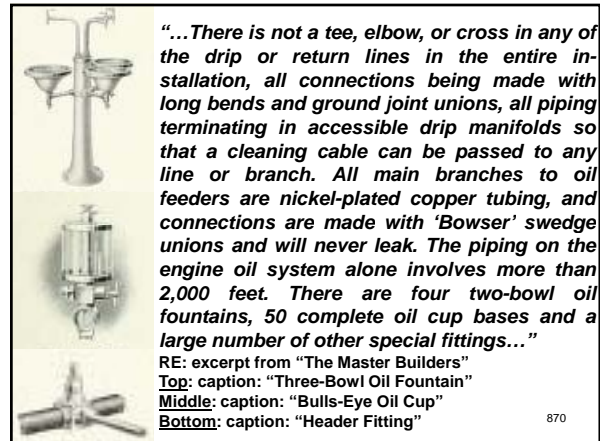
RE: excerpt from "The Master Builders"

868



Left: caption: "The Bowser Gravity Tanks. Illustration to the left shows the Bowser overhead gravity tanks fitted with wall indicators and equipped with high and low level electrically operated alarms. The oil is automatically controlled by a pump governor to any level. These overhead tanks have sufficient capacity to keep an entire plant supplied with oil for eight hour's time."

869



"...There is not a tee, elbow, or cross in any of the drip or return lines in the entire installation, all connections being made with long bends and ground joint unions, all piping terminating in accessible drip manifolds so that a cleaning cable can be passed to any line or branch. All main branches to oil feeders are nickel-plated copper tubing, and connections are made with 'Bowser' swedge unions and will never leak. The piping on the engine oil system alone involves more than 2,000 feet. There are four two-bowl oil fountains, 50 complete oil cup bases and a large number of other special fittings..."


RE: excerpt from "The Master Builders"

Top: caption: "Three-Bowl Oil Fountain"

Middle: caption: "Bulls-Eye Oil Cup"

Bottom: caption: "Header Fitting"

870



R. H. Macy & Co., Inc., New York's leading department store, selected Bowser filters and lubricators for their power plant extension.

Naturally! Macy's wanted the very finest apparatus and materials throughout their new nineteen-story addition, to continue to give store service of the high metropolitan standard.

Thus, in Macy's power plant, there are two of our R-P type oil filters; the famous model T lubricators are on all the new, and most of the old units.

Left: 1924 ad for the "Bowser Oiling System" (as used in Macy's, NYC)

RE: excerpt from "The Master Builders"

871

During the Winter Time

872

"...The architectural grandeur of any building designed for human occupancy would count as naught were careful consideration not given to the more homely details of construction that contribute to that great and powerful element of human desire – personal comfort. Imagine, if you can, a structure such as the Woolworth Building with all of its pleasing effects of architecture, without some means of providing artificial heat in its many rooms during the winter time. Under such conditions the marble hallways, the artistic chandeliers, and the polished furnishings would absolutely lose their charm, and the occupants of the rooms would forget the mission of them in the desire for a more practical deliverer of real satisfaction – good heat. It's human nature to stand with comparatively good grace anything displeasing to the sense of sight, but to become impatient instantly when the delicate sense of feeling is disturbed. The builders of the Woolworth Building observed and heeded this quality of human nature and placed in their building, in addition to beautiful forms and magnificent decorations, a heating system that has no peer in the field today..."

RE: excerpt from "The Master Builders"

873



If You Could Get A Tea Kettle Big Enough

Get out of your head the wrong idea that a boiler fire and fire or an electric burner prevent an emergency heating system. A radiator design should have good heating, adjustment, safety or safety, if the piping and radiators were correctly installed, and if each radiator were equipped with a Dunham Radiator Trap.

Such these traps are easily possible. We prove this every day – and want you to be skeptical enough to ask for proof right now. The Woolworth Building engineers asked, "Is there any other way to handle heat and steam?"

DUNHAM HEATING SERVICE

C. A. DUNHAM COMPANY Palmer Building CHICAGO

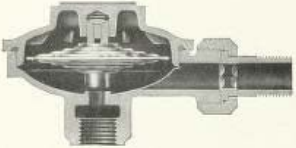
RE: excerpt from "The Master Builders"

Left: ca. 1920 Dunham advertisement for "The Dunham Heating Service" 874

"...The Woolworth Building by reason of its tremendous height presented several rather unique heating problems. One was to procure even distribution of heat in the highest stories, and another was to properly care for the expansion of the piping that carried the steam to these remote floors. Both of these problems were met successfully by the adoption of a system of heating that applies the vacuum principle of induced circulation. Steam is circulated into the farthest radiator quickly and without any attending noise..."

RE: excerpt from "The Master Builders"

875



C. A. Dunham Company
410 E. Ohio Street, Chicago 11, Ill.

THE DUNHAM DIFFERENTIAL HEATING SYSTEM

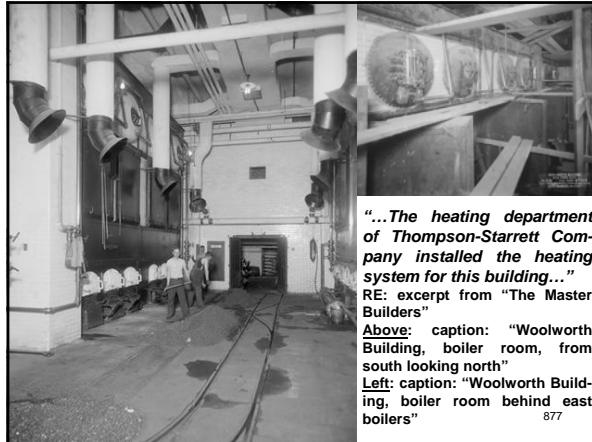
THE DUNHAM "Victory Line" VAPOR AND VACUUM HEATING SPECIALTIES

DUNHAM "VICTORY" RADIATOR TRAP
For Operating Pressures Up to 15 Lbs. Gauge

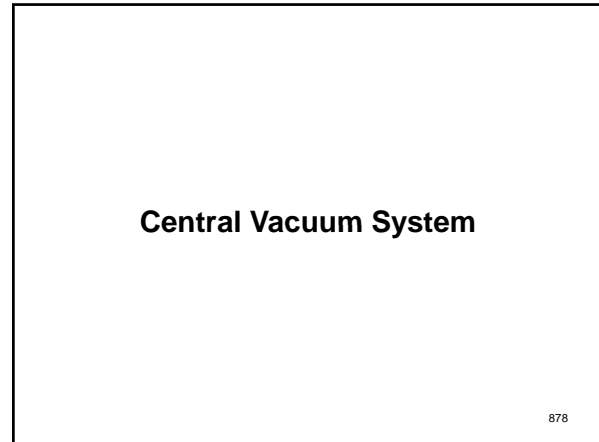
DUNHAM "VICTORY" RADIATOR VALVE (SPRING PACKED)

RE: excerpt from "The Master Builders"

Left: ca. 1944 advertisement for "The Dunham Differential Heating System" 876

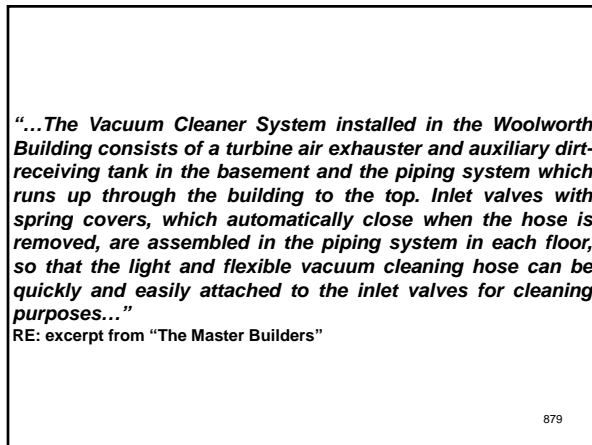


“...The heating department of Thompson-Starrett Company installed the heating system for this building...”
 RE: excerpt from “The Master Builders”
 Above: caption: “Woolworth Building, boiler room, from south looking north”
 Left: caption: “Woolworth Building, boiler room behind east boilers”
 877



Central Vacuum System

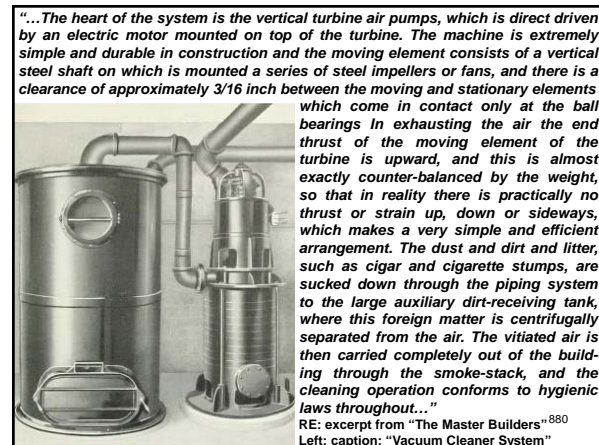
878



“...The Vacuum Cleaner System installed in the Woolworth Building consists of a turbine air exhauster and auxiliary dirt-receiving tank in the basement and the piping system which runs up through the building to the top. Inlet valves with spring covers, which automatically close when the hose is removed, are assembled in the piping system in each floor, so that the light and flexible vacuum cleaning hose can be quickly and easily attached to the inlet valves for cleaning purposes...”

RE: excerpt from “The Master Builders”

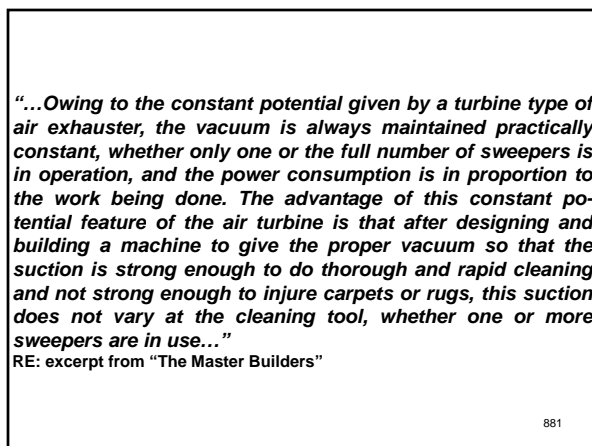
879



“...The heart of the system is the vertical turbine air pumps, which is direct driven by an electric motor mounted on top of the turbine. The machine is extremely simple and durable in construction and the moving element consists of a vertical steel shaft on which is mounted a series of steel impellers or fans, and there is a clearance of approximately 3/16 inch between the moving and stationary elements

which come in contact only at the ball bearings. In exhausting the air the end thrust of the moving element of the turbine is upward, and this is almost exactly counter-balanced by the weight, so that in reality there is practically no thrust or strain up, down or sideways, which makes a very simple and efficient arrangement. The dust and dirt and litter, such as cigar and cigarette stumps, are sucked down through the piping system to the large auxiliary dirt-receiving tank, where this foreign matter is centrifugally separated from the air. The vitiated air is then carried completely out of the building through the smoke-stack, and the cleaning operation conforms to hygienic laws throughout...”

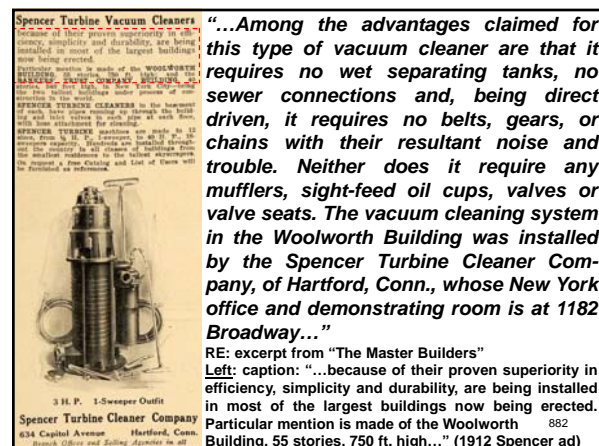
RE: excerpt from “The Master Builders”⁸⁸⁰
 Left: caption: “Vacuum Cleaner System”



“...Owing to the constant potential given by a turbine type of air exhauster, the vacuum is always maintained practically constant, whether only one or the full number of sweepers is in operation, and the power consumption is in proportion to the work being done. The advantage of this constant potential feature of the air turbine is that after designing and building a machine to give the proper vacuum so that the suction is strong enough to do thorough and rapid cleaning and not strong enough to injure carpets or rugs, this suction does not vary at the cleaning tool, whether one or more sweepers are in use...”

RE: excerpt from “The Master Builders”

881



Spencer Turbine Vacuum Cleaners because of their proven superiority in efficiency, simplicity and durability, are being installed in most of the largest buildings now being erected.

“...Among the advantages claimed for this type of vacuum cleaner are that it requires no wet separating tanks, no sewer connections and, being direct driven, it requires no belts, gears, or chains with their resultant noise and trouble. Neither does it require any mufflers, sight-feed oil cups, valves or valve seats. The vacuum cleaning system in the Woolworth Building was installed by the Spencer Turbine Cleaner Company, of Hartford, Conn., whose New York office and demonstrating room is at 1182 Broadway...”

RE: excerpt from “The Master Builders”

Left: caption: “...because of their proven superiority in efficiency, simplicity and durability, are being installed in most of the largest buildings now being erected. Particular mention is made of the Woolworth Building, 55 stories, 750 ft. high...” (1912 Spencer ad)

882

Part 10

At Home in the Clouds

883

Cachet

884



"The Woolworth Building's neo-Gothic tower, one of New York City's most recognizable landmarks, is about to be turned into luxury condominiums, a transformation that would be second only to placing penthouses atop the Chrysler Building or the Empire State Building. The world's tallest building when it opened in 1913, the Woolworth Building was called the 'Cathedral of Commerce,' its copper-domed tower soaring 792 feet into the skyline. Now, in a \$68 million deal made final last week, the tower will be turned into about 40 luxury apartments, including a five-level penthouse in the cupola. In a condo market still recovering from the Lehman Brothers crash in 2008, some developers have focused on conversions as a way to create new luxury apartments that cater to an eager, astronomically wealthy clientele who in the past few months have spent tens of millions of dollars on sumptuous apartments. With its historic status downtown, the Woolworth Building has the cachet to give it an edge over its competitors..."
The New York Times, August 7th 2012

885

In 1998, the Witkoff Group and Cammeby's International formed a partnership to buy the Woolworth Building for \$126.5 million. At one point, they considered remaking the tower as exclusive office space from the 29th to the 57th Floor/s. As part of that plan, the top twenty-five floors (ranging from 3,500 to 8K square-feet) were gutted and remained vacant (\$80 million in post-9/11 "Liberty Bonds" were approved to help fund the project). There was much speculation and potential buyers in the intervening years, but in the end, the field narrowed down to just four serious buyers for the tower's transformation from dormant office space to upscale residences. Initially, 145 residential units were planned, but that has since been revised to thirty-four luxury residences.

886

The Mama

887

"...An investment group led by Alchemy Properties, a New York developer, bought the top 30 floors of the landmark on July 31 from the Witkoff Group and Cammeby's International, which will continue to own the lower 28 floors and lease them as office space. 'It's very exciting for us,' said Kenneth S. Horn, president of Alchemy Properties. 'We've done a lot of historic buildings in the city, but this is 'the mama,' as they say. The agreement promises to reinvent the tower that telescopes up at 233 Broadway, between Park Place and Barclay Street, as one of Manhattan's most sought-after addresses, adding yet another chapter to the history of this Cass Gilbert-designed monument to Frank W. Woolworth and his five-and-dime empire..."
The New York Times, August 7th 2012

888

“This is a very exciting deal. We will be working with a truly iconic building which is a landmark not only in New York but internationally as well. We intend to design the apartments and the residential common elements in a first-class manner that will work with the architecture and light, air and views, to truly develop homes that are worthy of the building’s pedigree.”

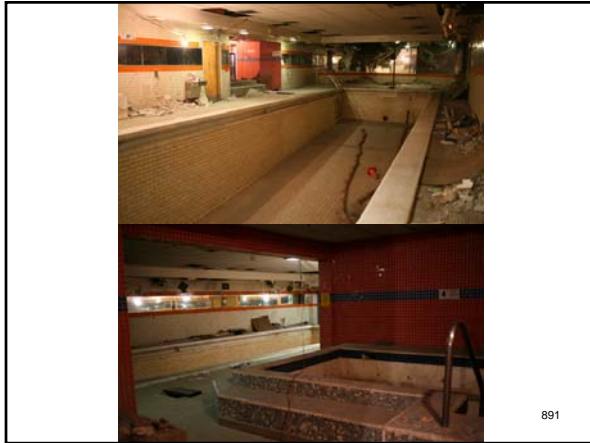
Kenneth Horn, President of Alchemy Properties (August 2012)

889

What the landmark luxury pad could look like

...Apartments will begin at 350 feet above ground level, offering panoramic views of Lower and Midtown Manhattan, Brooklyn and New Jersey. The condos, with ceiling heights of 11 to 14 feet, are expected to be completed by 2015. Penthouses will be among the highest-altitude residences in the city, soaring above 700 feet. An abandoned 55-foot-long basement swimming pool, originally part of a health club, will be restored as a amenity for residents. A new entrance on Park Place will serve residents with an elevator bank separate from that used by the office tenants on the lower floors...The project will cost approximately \$150 million...Although apartment prices have not been set, they may sell for as much as \$3,000 a square foot...

890
The New York Times, August 12th 2012



The Norm

893

“Not many people in the world would get to say they live in the Woolworth Building - one of the city’s most recognizable buildings. I think they’re coming on the market at the right time to do this...the new normal for iconic buildings, you’re already raising the bar to begin with”

Andrew Gerring - executive for the Marketing Directors, a NYC development, leasing and marketing company

RE: the average price (per square foot) of apartments sold in the second quarter of 2012 in the Woolworth Building’s ZIP code (10007) was \$1,250/SF. Noting that the Woolworth Tower Apartments will begin on higher floors than most traditional pre-war buildings, he expects \$2K/SF to be “the norm.”

894



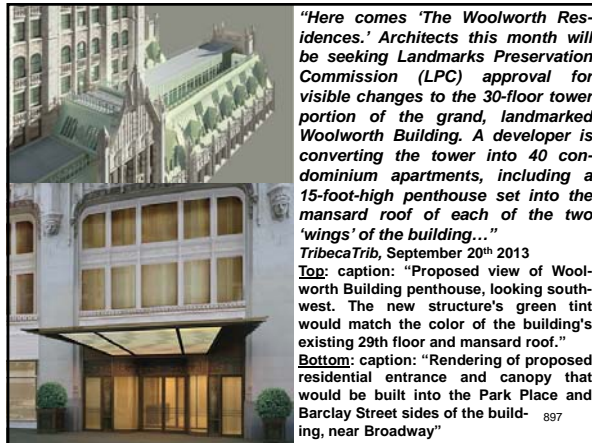
Top Left: 47th Floor existing elevator bank
Top Right: 51st Floor framing exposed (note the exposed terra cotta flat-arch of the 52nd Floor above)
Left: new elevator shaft opening

895



There Goes the Neighborhood

896



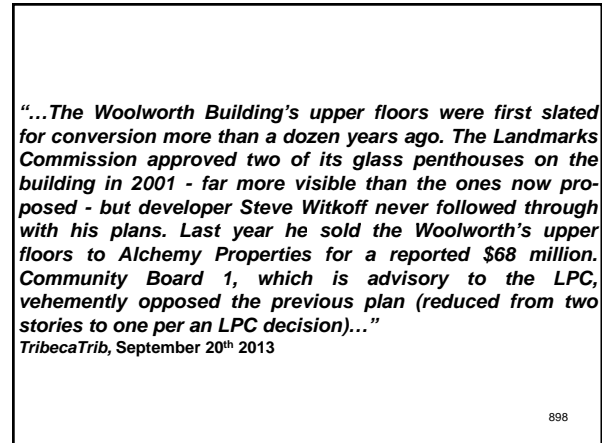
"Here comes 'The Woolworth Residences.' Architects this month will be seeking Landmarks Preservation Commission (LPC) approval for visible changes to the 30-floor tower portion of the grand, landmarked Woolworth Building. A developer is converting the tower into 40 condominium apartments, including a 15-foot-high penthouse set into the mansard roof of each of the two 'wings' of the building..."

TribecaTrib, September 20th 2013

Top: caption: "Proposed view of Woolworth Building penthouse, looking southwest. The new structure's green tint would match the color of the building's existing 29th floor and mansard roof."

Bottom: caption: "Rendering of proposed residential entrance and canopy that would be built into the Park Place and Barclay Street sides of the building, near Broadway"

897



"...The Woolworth Building's upper floors were first slated for conversion more than a dozen years ago. The Landmarks Commission approved two of its glass penthouses on the building in 2001 - far more visible than the ones now proposed - but developer Steve Witkoff never followed through with his plans. Last year he sold the Woolworth's upper floors to Alchemy Properties for a reported \$68 million. Community Board 1, which is advisory to the LPC, vehemently opposed the previous plan (reduced from two stories to one per an LPC decision)..."

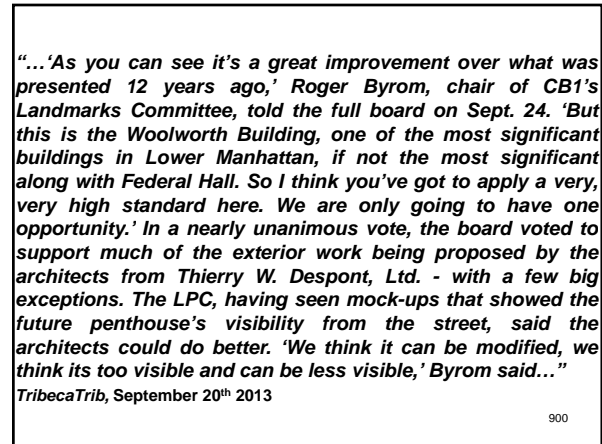
TribecaTrib, September 20th 2013

898



A Great Improvement

899



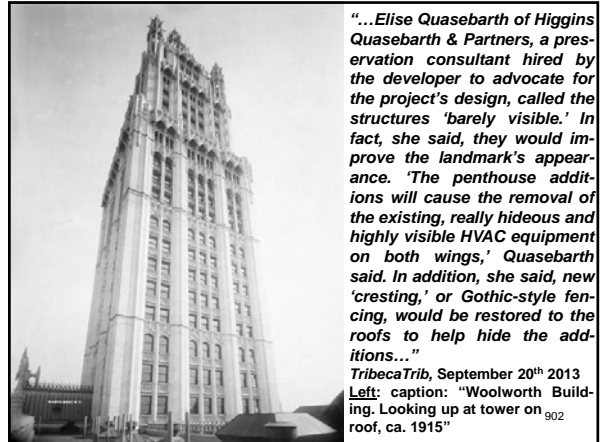
"... 'As you can see it's a great improvement over what was presented 12 years ago,' Roger Byrom, chair of CB1's Landmarks Committee, told the full board on Sept. 24. 'But this is the Woolworth Building, one of the most significant buildings in Lower Manhattan, if not the most significant along with Federal Hall. So I think you've got to apply a very, very high standard here. We are only going to have one opportunity.' In a nearly unanimous vote, the board voted to support much of the exterior work being proposed by the architects from Thierry W. Despont, Ltd. - with a few big exceptions. The LPC, having seen mock-ups that showed the future penthouse's visibility from the street, said the architects could do better. 'We think it can be modified, we think its too visible and can be less visible,' Byrom said..."

TribecaTrib, September 20th 2013

900

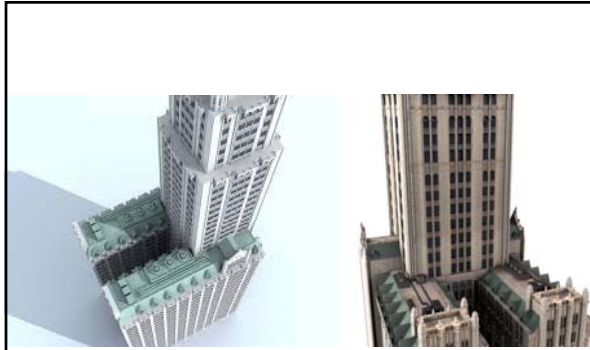
Barely Visible

901



"...Elise Quasebarth of Higgins Quasebarth & Partners, a preservation consultant hired by the developer to advocate for the project's design, called the structures 'barely visible.' In fact, she said, they would improve the landmark's appearance. 'The penthouse additions will cause the removal of the existing, really hideous and highly visible HVAC equipment on both wings,' Quasebarth said. In addition, she said, new 'cresting,' or Gothic-style fencing, would be restored to the roofs to help hide the additions..."

*TribecaTrib, September 20th 2013
Left: caption: "Woolworth Building. Looking up at tower on roof, ca. 1915"*



903

"...Quasebarth also argued against the board's objections to a plan to enlarge the windows on the buildings ornate pinnacle. The larger windows are needed, she said, for the top apartments and are 600 feet from the ground. 'Keep in mind the pinnacles are way up there,' she said, explaining to the board that 'they are absolutely necessary' to meet the legal requirement for light and air for the highest apartments. 'I think you can work around what's there,' Byrom responded..."

TribecaTrib, September 20th 2013

904

They'll Know Where it is

905

"...Finally, there was the matter of a proposed canopy over the residential entrance on Park Place. (The main entrance, on Broadway, will be used only by commercial tenants.) The CB1 resolution called it unsuited to the building's original design. 'It's certainly not something you see in Lower Manhattan,' said committee member Corie Sharples. 'I get how a building on the Upper East Side from this era might have something like that. But it feels like it doesn't belong here.' 'It's exceptionally important for us to have something that marks the residential entrance that distinguishes it from commercial storefronts and the main entry to the building on Broadway,' Quasebarth argued. 'People will find their way into this building,' Byrom replied. 'They'll know where it is.'"

TribecaTrib, September 20th 2013

906

2,200,000,000,000 Nickels

907

"Save your nickels, New Yorkers - you'll need millions of them to shop at Woolworth's now. \$110 million to be exact. If permits clear, the entire top of the Woolworth Building - one of the city's first skyscrapers - will be available as one luxury apartment. The buyer could even snag private access to a tiny deck at the very top, with 360-degree views of the city...the glass elevator will be reproduced for the exclusive use of the penthouse buyer as an internal elevator. Developer Kenneth Horn's Alchemy Properties, which bought the top 30 floors of the Woolworth and is making them over into 34 apartments, isn't saying much about the plans yet - but has hired designer Thierry Despont to give it a luxury Art Deco upgrade. There may be safety problems or other occupancy issues that would prevent the developers from selling the topmost portion of the cupola, which could prevent access to the observation deck. Other spectacular high-floor city condominiums have sold for \$45 million to \$88 million. Asking prices at the upcoming 432 Park Ave. are topping \$6,000 per square foot. The handful of full-floor Woolworth units, especially the 49th floor with its 1,500 square feet of surrounding terraces, which is just below the multi-level tower penthouse, are also likely to command much more per square foot and perhaps set price records for the city."
New York Post, May 25th 2014

908

Yesterday, Today and Tomorrow

909



"The Woolworth Building is a symbol. Its lighting, by fogged reflectors in frosted glass, snow-white in color, diffusing a soft light comforting the eye, is of tomorrow, the decorations in the banking room are of the past; its air-washers, delivering air sucked of its moisture to the proper percent, cooling in summer, heating in winter, are of tomorrow - the mosaic decorations on the hall ceilings are of the past; its mail chutes and directories, beautified, bronzed, and harmonized with the building, acutely modern, are of tomorrow - the flower traceries on the outside, an admirable scale-study, academically proportioned to distance, are of the past; the Woolworth Building looms up, at right angles to antiquity."
The Soil, January 1917

910

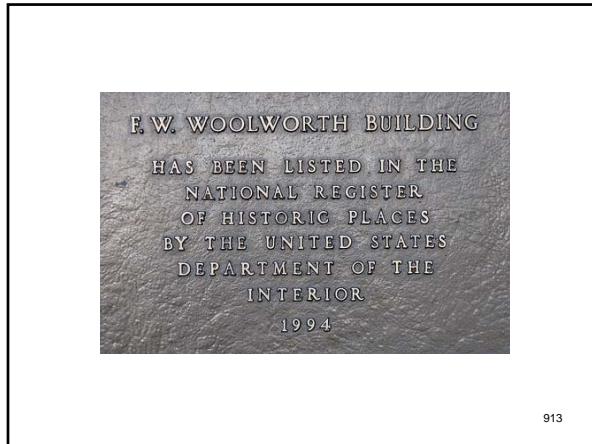
Truly American

911



"The Woolworth Building stands today as a monument, not only to Frank W. Woolworth, who commissioned it, but to Cass Gilbert, who designed it. Gilbert won the acclaim of the city with this building, completed in 1913, for his use of Gothic forms and detail, which at the time seemed well adapted to the soaring verticality of the skyscraper. From 1913 until 1930 it reigned as the world's tallest building and remains today a monument to Woolworth and American enterprise as well as an important step in the development of the skyscraper, a truly American contribution to architecture."
RE: excerpt from the nomination form for the Woolworth Building to be placed on the Department of the Interior's National Register of Historic Places.

912



913