The Curtain Wall

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- Conventionally the history of the **curtain wall** in texts on architecture goes back to the Crystal Palace, but from a technical point of view there seems little obvious lineage between that building and the cladding of skyscrapers in some form of light-weight walling. What resemblance there is between the Crystal Palace and the glass-clad skyscrapers of today is a rather superficial architectural one; simply the use of a glass wall.
- An early use of the term simply defined the curtain wall as 'a continuous curtain of masonry penetrated by windows.'1 This refers to a style of architecture in which there is no overt expression of structure .
- The curtain wall that we know today is the kind of innovation that comes from a combination of ideas, the essential elements here being the separation of wall from struc.ture and the subsequent development of light.weight walls. Curtain walling does not simply mean hanging sheets of glass over the fronts of buildings, even though that was the earliest form it took in Europe.

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The large **glazed wall** was hardly a rarity even in the early years of this century. It was a necessity in factory construction, and the development of **Albert Kahn's motor-car** factories in the Unites States shows the way in which buildings of this type had increasingly larger areas of uninterrupted glazing.

In Kahn's plant for Pierce at Buffalo, N.Y. in 1906 the concrete structure is a prominent feature of the elevations, but three years later in his Highland Park plant for the Ford company, this had been reduced to a thin grid between large areas of Critall's steel sash, imported from Britain.

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It was in the work of **Walter Gropius** where glazing was most exploited for architectural effect at that time. The wall of the **Fagus factory (Gropius & Meyer, 1911) is still a series of large windows**, although windows which extend over the three floors, set as they are in deep frames between the columns. Reyner Banham has pointed out, that the windows project forward in the way that they do because the columns between them are battered, effectively reversing the treatment used by Behrens for the AEG Turbine factory, only three years before. The resulting architectural treatment is that the columns visually support just the projecting entablature of the roof, but unique for the time is the uninterrupted passage of the window frames past the floors, quite natural at the staircase corners, but not for the wall in front of floor slabs.

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In the **Bauhaus at Dessau (1925-6) Gropius** repeats the trick of carrying the glazing continuously over the three floors; but now it is uninterrupted by columns which are also set back behind the glass, and the glass itself is uninterrupted by opaque panels because there is no back up wall.

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One sees the edges of the floor slabs and the radiators standing on the floors behind. Strictly speaking this was not a factory although, as the workshop block, it had a very similar function, so that this was only a small step away from factory design.

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In the Van Nelle factory, Rotterdam (1925-30) the continuous glass facade was essentially a simple development of window technology, lm wide elements spanning 3.7 m from floor to floor were fabricated from 35 mm standard steel Critall sections, manufactured under license in Holland. These were connected with 10 cm deep steel mullions, which provided structural stiffness.

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Noted examples of buildings in Europe in which the wall was treated as a glazed screen are the Maison du Peuple, Brussels, by Horta, (1896-9), and the Samaritaine Department Store, Paris, by Frantz Jourdain, (1905).

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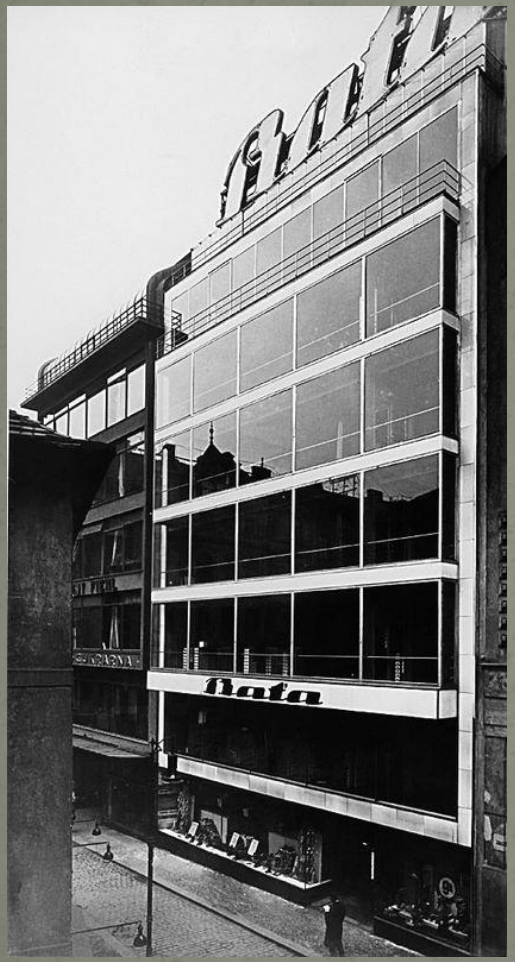

Nothing like this was seen in Europe until the building of the Bata shoe store in Prague (1927-9) designed by Ludvik Kysels, although this still did not have a full glass facade .
In the Bata store " the ribbon windows overlooking Jungmann Square almost swallow their ledges so that all that remains are the shining white strips between them". The architect was seeking the maximum area of glazing but, unable to completely dispense with the supporting floor, chose to express it clearly.

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The 1920s saw the production of a number of books and projects exploring the use of glass: their subject was glass rather than the curtain wall because the latter was at that stage only one possible manifestation of the material. Also, it was only architectural forms that were being explored rather than any associated technology that might enable the ideas to be translated into reality.

The beginning of this was Scheerbart's 1914 book, "Glasarchitektur" later commented on by Reyner Banham, but the best known explorations of the architectural possibilities of the glass wall were those of Mies van der Rohe, beginning with his glass tower in 1920.

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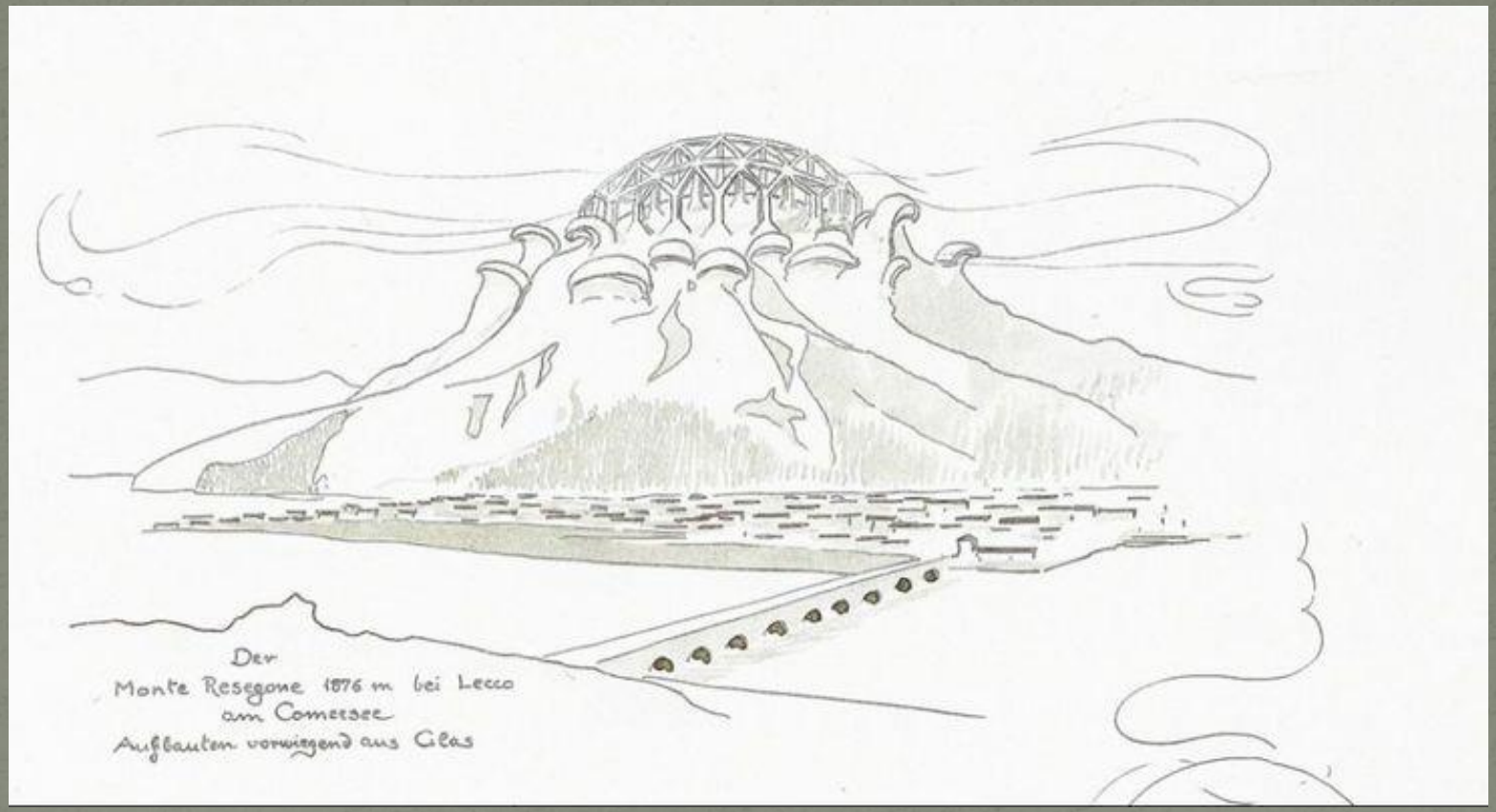

Alpine Architektur, is a book by Bruno Taut, in which he portrays his utopic project for a city in the Alps.

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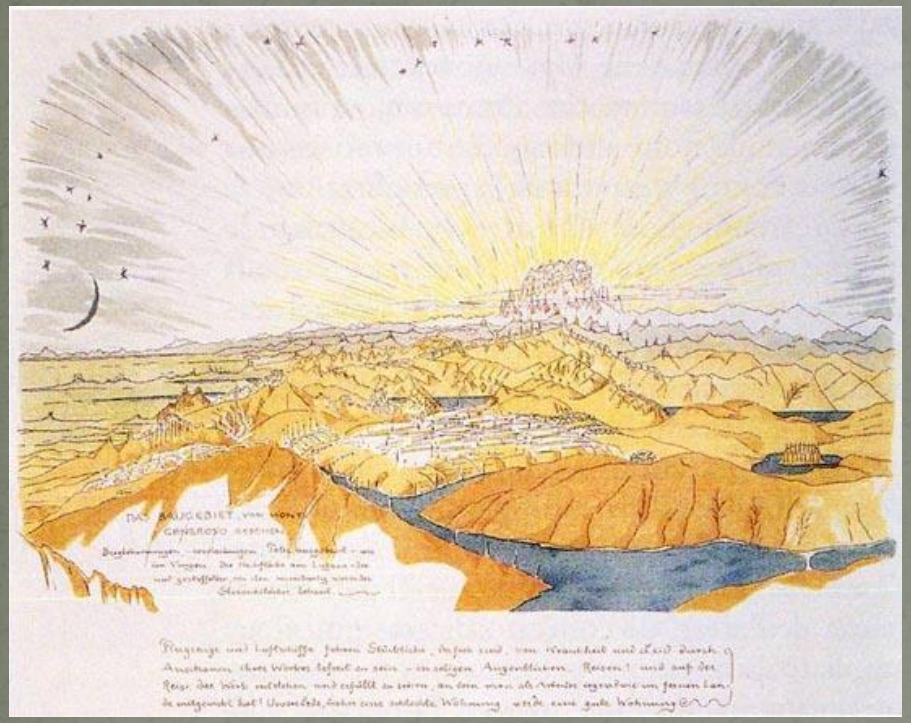

This is the view from the Monte Generoso by Taut in Alpine Architektur.

Alpine architecture was a free project, solved with no apparent restrictions, no limitations owing to the place, material, or economy's conditions. They were houses made of crystal on the mountains top, designed only for silent gazing and located next to the lakes, which reflected the buildings and the sparkling sunshine. These buildings were meant for the community of their inhabitants to build, just as cathedrals were built in the medieval age, a fantastic view of the construction of glazed temples in the Alps. In his exhibition, he introduces ideas of transparency, transformation, movement, and constant change and dissolution notions.

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In 1912 Taut met Paul Scheerbart, a visionary writer of novels and short stories, which described glazed architecture of mobile houses, which could rotate, and buildings that could rise and descend, structures that floated and moved through air, even cities on wheels., The book *Glasarchitektur* (1914) is dedicated to Taut.

Taut's book *Alpine Architektur* was also homage to Scheerbart, who died in 1915.

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In his *Glass Architecture*, and defending glass architecture, Paúl Scheerbat insisted on the effect that its lit interior would have on the building at night. That same year, Bruno Taut exhibited his *Glass House*, in the *Cologne Werkbund Exhibition*, and the exhibition's brochure stated that after sunset glass buildings turned into incandescent torches with lighting coming out only from inside.

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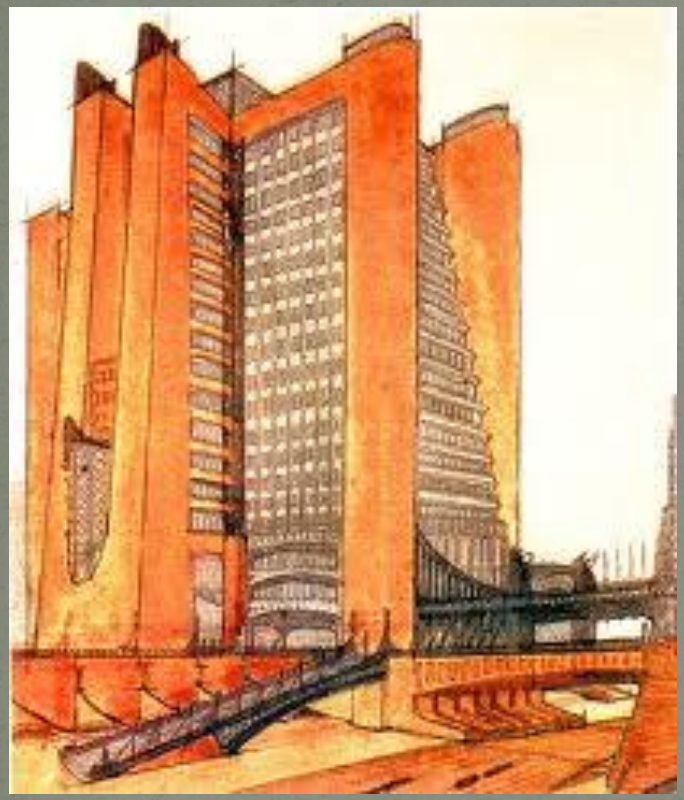

Concerning industrial architecture another important example is offered by the futurist Antonio Sant'Elia.

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Le Corbusier's interest in the use of glass culminated in the glazed wall of his Cité de Refuge, Paris (1932-3). However, this still depended upon support from the floors and so still had a horizontal rather than a vertical direction to the glazing even if this was not overtly expressed .

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Robert Davison was an early champion of the idea of curtain walling, although not involved initially in its design. In 1929, he was a member of the editorial staff of “Architectural Record” and produced an extensive article on new construction methods which included a section on curtain walls. In this he remarked that, "it is the opinion of some leading architects of Europe and America that it is entirely practical to eliminate masonry by using metal mullions , as in the Bauhaus. Or, if one desires to have solid walls for architectural effect, one may use metal panels between the mullions .“ He illustrated the Van Nelle Factory, Rotterdam as an example of the use of curtain walling.

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- However it was not the glass curtain wall that really interested him but rather the metal panel wall. The following year, he was able to report the construction of a block of apartments in Chicago that used a metal panel curtain walling system.
- The advantage of the panel wall to Davison was the increased usable floor area that it gave. Both articles have drawings comparing the curtain wall with a conventional wall, emphasising the additional floor area available when the floor did not have to support the thickness of the spandrel wall under the window .
- In 1950 Davison discussed the current situation in a contribution to the March issue of "Architectural Forum" which was a special issue on the curtain wall. The articles in this issue were preceded by a number of advertisements for curtain-wall systems many of which resembled his panels in being fixed to the face of the structure. Noteworthy are those by Allegheny Metal, illustrating a 4-storey office building and offering a free technical brochure for architects, and USS Stainless Steel which offered both stainless and porcelain- enamelled steel panels and appeared to have an advisory service

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Skidmore Owings and Merrill (SOM), Lever Building, New York, 1949-52.

In 1952, the same year as the construction of the Alcoa and the Equitable Life buildings in Pittsburgh, New York saw the construction of what must be regarded as the landmark buildings in glass curtain walling, the UN and Lever buildings. These may have presented similar architectural images but they used quite different technologies to achieve their results. The UN building used standard sliding sash windows while the Lever dispensed with opening lights as a means of limiting its air conditioning load. The "Architectural Record" gave the impression that one reason for the selection of this type of architecture for the latter was the clean look that it gave the building, and that it could be maintained; important for the headquarters of a soap manufacturer.

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THE LADY AND THE ARCHITECTS

Johnson and Mies, Client Lambert

The Seagram building was the work of an unusual team headed by three people: Architects Mies van der Rohe and Philip Johnson, and 31-year old Phyllis Bronfman Lambert, daughter of Seagram President Samuel Bronfman, and long a passionate *aficionada* of modern architecture. After seeing some preliminary, less-than-inspiring proposals for Seagram's new headquarters in 1954, Mrs. Lambert told her father that he was on the wrong track, that he ought to try to build the finest skyscraper that modern architecture could produce, and that she would help him do just that. There followed a two-and-one half-month search for an architect. Mrs. Lambert got Philip Johonson, then director of architecture at New York's Museum of Modern Art, to draw up a list of the top dozen men in U.S. architecture, talked to them and saw their work. Mrs. Lambert's final choice: Chicago's Mies van der Rohe, with Johnson (who had a New York office and was registered in the state) as Mies's associate. Seagram President Bronfman approved wholeheartedly, appointed his daughter director of planning to represent the clients in Mies's and Johnson's office. In her position as client, Mrs. Lambert took an active part in almost every major—and many minor—design decisions, helped select materials, equipment, furnishings and, most importantly, the paintings, sculpture, and tapestries that distinguish the interiors of the building. Her ultimate triumph will be the art commissioned for a luxurious ground-floor restaurant that will be opened to the public next year.

From "Architectual Forum", luglio 1958, p. 77.

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Commissioned in 1954 and completed in time for the corporation's centennial in 1958, the Seagram Building stands as an important landmark not only in Mies's career and the story of the Seagram company, but also in the history of American architecture. It was, and remains, one of the most famous, most meticulously analyzed, and oft-cited modern buildings in the world. Even before its completion, the project enjoyed significant publicity and public attention .

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Walking along Park Avenue and noting how the existing buildings and noting as relentlessly lined the sidewalk, Mies felt the need of space in order to be able to see the building. The notion of setting a sheer tower back from the building line on all sides and ninety feet back from Park Avenue was highly innovative creating an unprecedent opening in the city fabric. Opposite the Seagram building rises the neo Renaissance Mc Kim Mead and White's Racquet and Tennis Club (1918).

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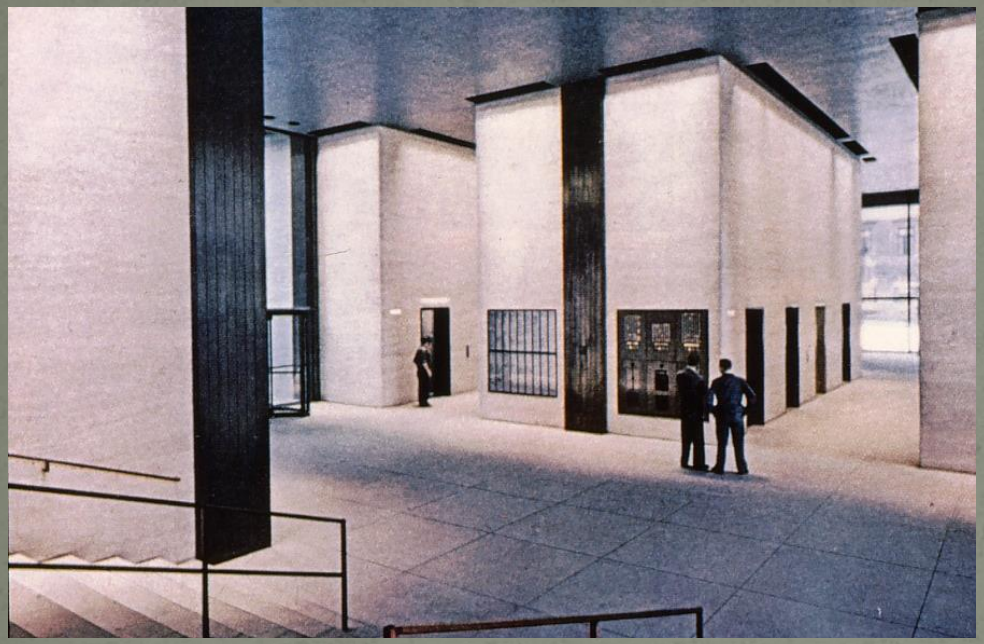

Because the 24-foot-high lobby is glass walled, it "reads" as an integral part of the outside plaza and seem much more spacious than it really is. At night the spaciousness if further accented by the wash of light (from recessed ceiling fixtures on dimmesr) spilling over the travertine walls that enclose the elevator shafts. The ceiling is finished in gray glass mosaic, set in black cement. This beautiful surface mirrors the subtle coloring of travertine walls, floors, and bronze columns.

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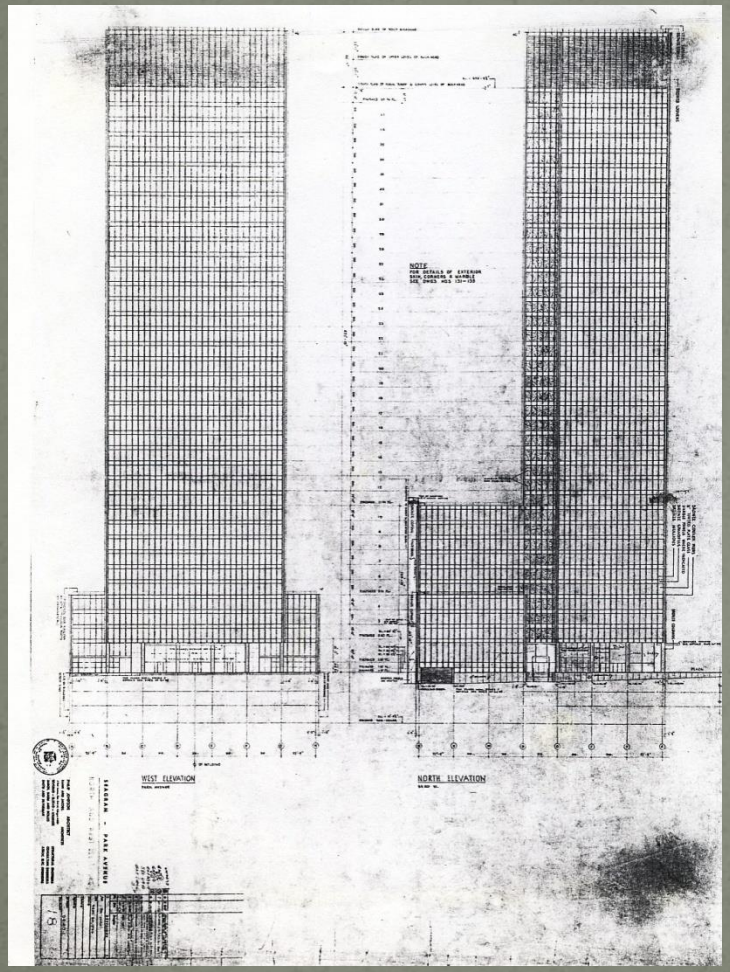

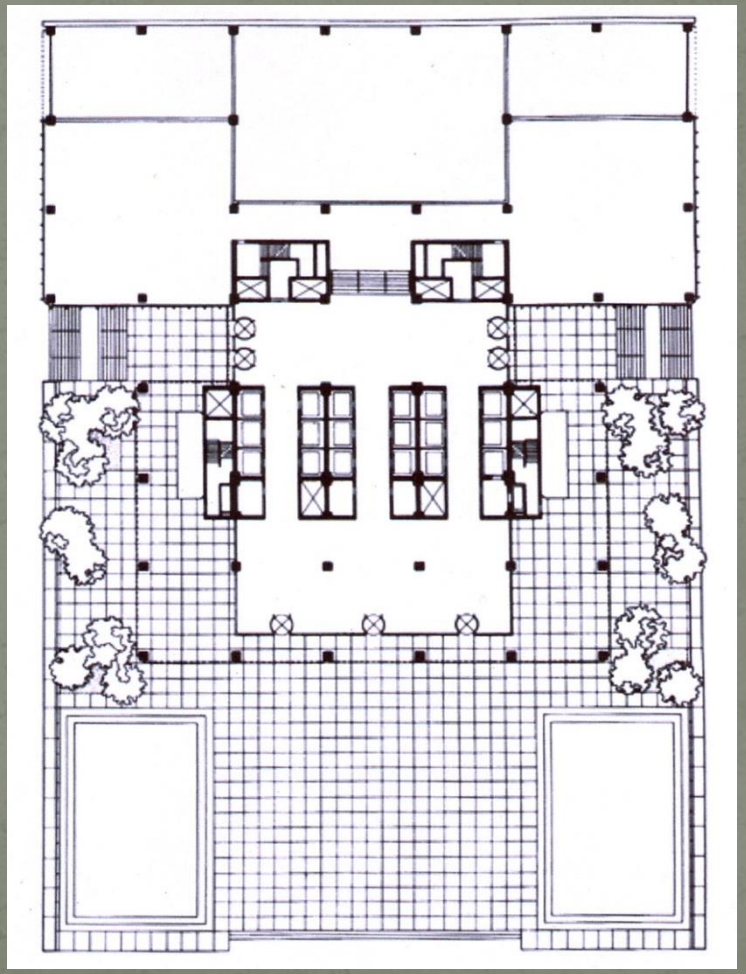

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Granite paved plaza and wide arcades recall the scale of Renaissance piazzas. The pavement is kept ice-free in the winter by radiant heating system, and pools will be overheated to generate steam for dramatic effect.

Setting the tower back from Park Avenue the architects achieved two results: the set a new and generous standard for the open city space and they gave pedestrians and motorist something really stunning to gasp at – a sleek faced soaring straight up for 520 uninterrupted feet, and made to look even taller by virtue of its closely spaced, vertical ribs of bronze. The first result adds up to high prestige and a fine public relations gesture; the second to high showmanship and a fine institutional advertisement.

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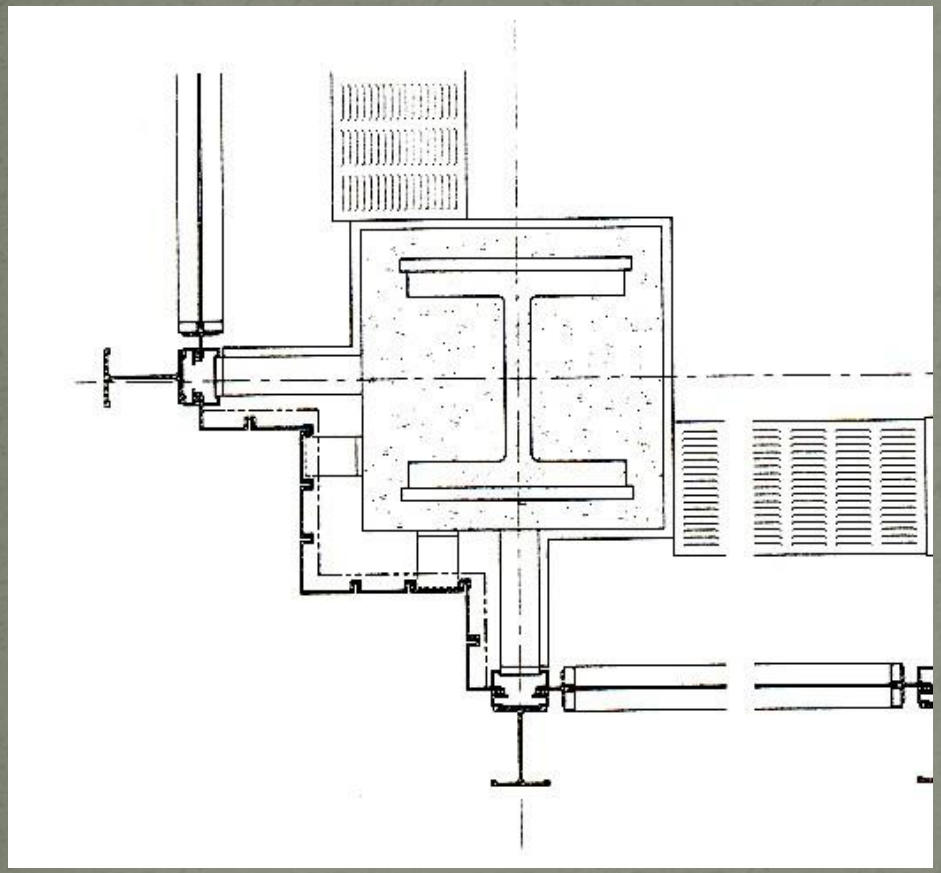

Bronze and glass curtain wall consists of 4½ by 6 inch I-beam extrusions (larger sections ever extruded in bronze), spandrels of Muntz metal (an alloy which resembles mullions in colour, but contains more copper) and pinkish-gray, heat and glare resistant glass in story-high bronze frames. I-beams were extruded 26 feet long. Complete cost of wall: $ 18 per square foot (Lever House would cost $ 13 today).

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The protruding bronze I-beam of the façade.

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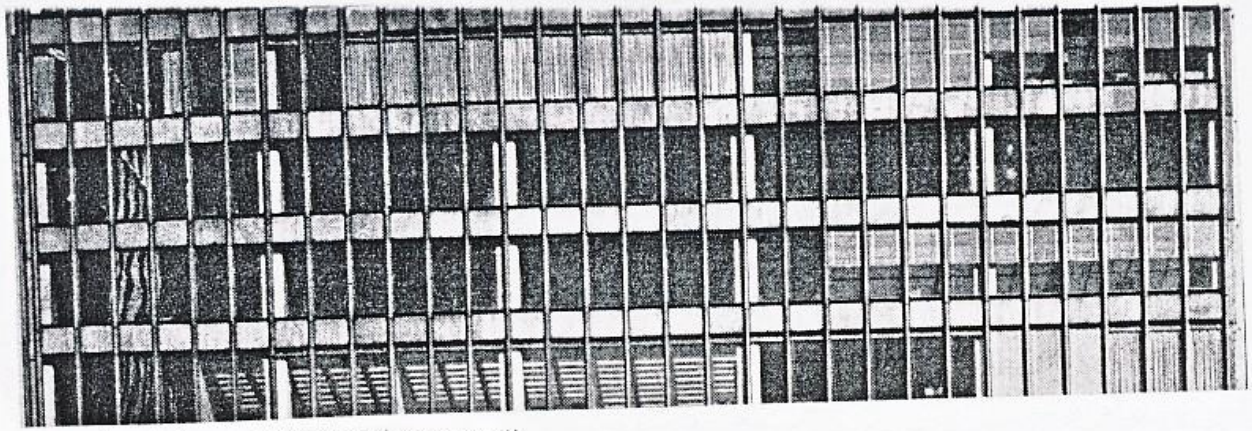

PHOTOS: (ABOVE) © EZRA STOLLER; (OTHERS) GEORGE CSERNA

2. *Controlled Venetian blinds* were specially designed to stop in only three positions: all the way up, all the way down, and at half mast. The angle of the slats is fixed at 45 degrees to let pedestrians get full impact of lit-up building at night. These controls produce façade patterns that always look neat.

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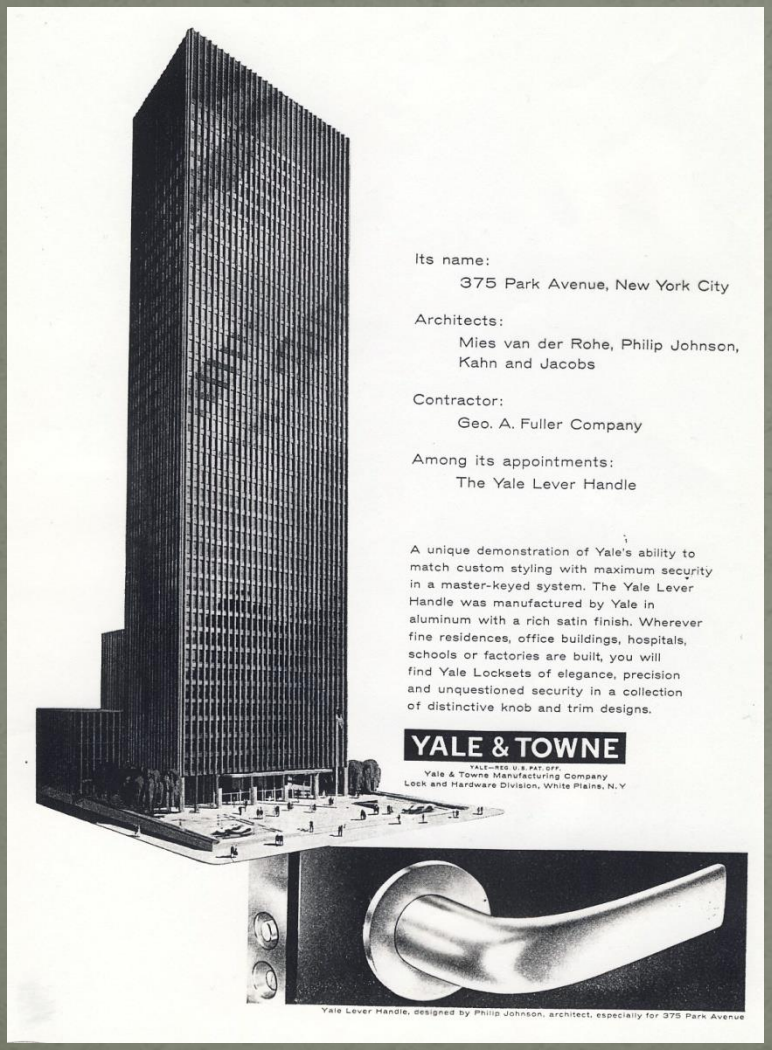

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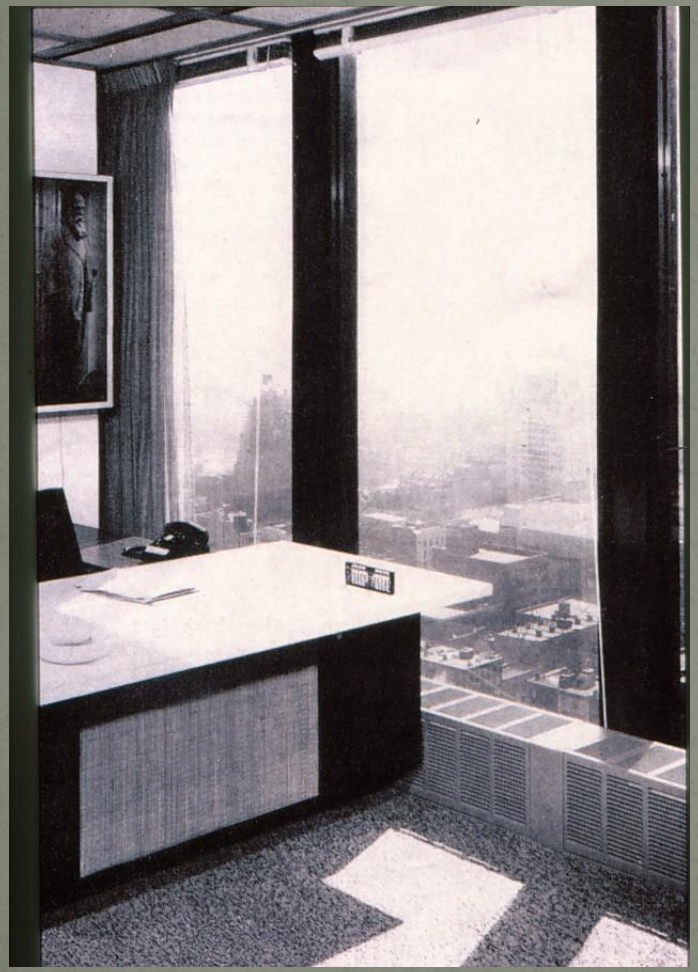

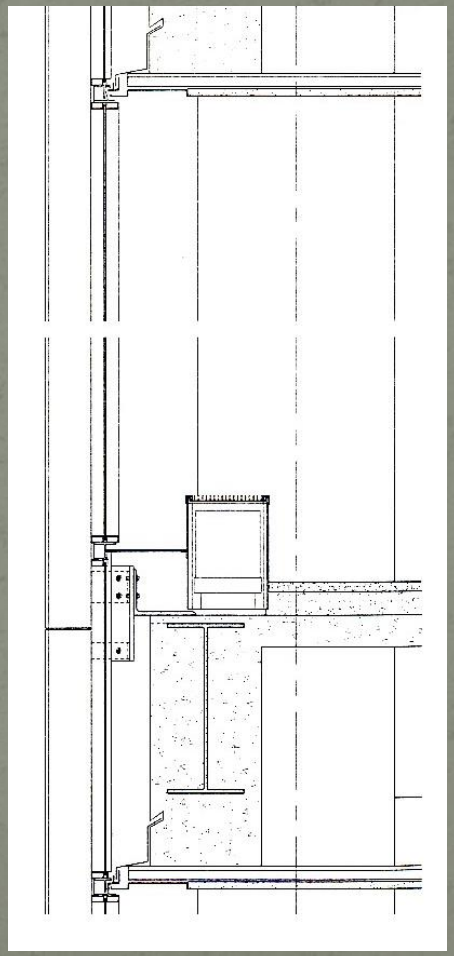

The new air conditioning system.

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Floor – to- ceiling doors (left) made doors look like integral part of paneling , hence gave interior greater unity. This corridor is part of Seagram's executive suite.

Floor- to -ceiling partitions are stock units reworked for Seagram by the architects.

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