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The Early Chicago Tall Office Building: Artistically and Functionally Considered



Figure 1: Exterior, Homes Insurance Building, Chicago (1883–85) William LeBaron Jenney, with added upper floors (demolished)

In architectural and urban histories, two points stand out about Chicago: the city's rapid growth and the development of the tall office building there. Founded as a settlement only in 1803, by the end of the 19th century Chicago's population exceeded one and a half million and the city had claimed its position as the second city of the United States and rival to New York.¹ This rivalry appears in histories of architecture, especially with regard to the development of the tall office building, or early skyscraper, as both cities claimed its origin. What matters here, however, is not the question of origin but Chicago's identity and architectural sensibil-

ity. New York was closer to Europe both geographically and culturally, and the influence of European architectural preferences was greater there. Chicago expressed itself through its architecture as being more pragmatic and less historical than that of New York, a bit tougher, and, especially in these early years, more in tune with the economic demands of modernity.

In this context it is necessary to observe the difference between modernity and modernism. Modernity refers to the industrial revolution, the changes in the means of production, and the harnessing of new forms of energy, as well as the dislocations and economic restructuring that caused great social changes. The effects of the industrial revolution were exaggerated in the United States by its rapid development, its great numbers of immigrants, and its seemingly unlimited resources. This contributed to rapidly growing Chicago and to the development of the tall office building, especially the speculative building which was expected to produce revenue. Modernism, on the other hand (as in "international style modernism"), was an aesthetic sensibility of philosophical, intellectual, and artistic origins.

The tall office building did not originate as a work of art, but as a response to economic pressure and rising land values caused by expanding business and population. In the years of rebuilding after the great fire of 1871, the Loop (or business district) became more purely commercial, but its area was limited by Lake Michigan on the east, branches of the Chicago River on the north and west, and a bulwark of railroad yards on the south. Because so much of business required face-to-face contact, the only way to accommodate growth was to go up. Building up was made possible by the more economical production of steel, advancements in structural wind bracing and foundations, and the development of fireproofing, as well as by technological advancements in plumbing, heating, ventilating, and perhaps most important of all, in the safety, reliability, and speed of the elevator.

These forces also created the demand for larger, more complex speculative office buildings: revenue-producing machines that architects designed, and contractors built to meet client specifications, often represented by a building and rental agent. Yet architecture is an art, and the plans, sections, and elevations required the work of an architect to make the buildings not only functional and sound, but culturally legible and acceptable. More than that, in the context of the office building, it had to be desirable. This is not just a reiteration of the Vitruvian triad of 'commodity, firmness, and delight.'² Delight, or desirability, was now part of the design's function to attract tenants and produce revenue.

The history of the tall office building in Chicago can be encapsulated in a comparison of two of its most prominent firms: Adler & Sullivan and Burnham & Root. Dankmar Adler hired Louis H. Sullivan in 1879, and they formed the firm of Adler and Sullivan in 1881.³ Daniel H. Burnham and John W. Root formed their firm in 1873.⁴ With a few modest diversions, these Chicago local firms will be the focus of this discussion.

The firms competed for the same projects, but the principals had different strengths. Sullivan disparaged Burnham for thinking of architecture as a business. From the outset Burnham strove for larger projects: “my idea is to work up a big business, to handle big things, deal with big businessmen, and to build up a big organization, for you can’t handle big things unless you have an organization.” The business corporation was the model for the large architectural offices. Not intending any flattery, Sullivan observed that “the only architect in Chicago to catch the significance of this movement was Daniel Burnham, for in its tendency toward bigness, organization, delegation and intense commercialism, he sensed the reciprocal workings of his own mind.”⁵ On the other hand, Sullivan admired Root’s “great versatility and restrained originality” in design.

Adler’s position was somewhat similar to Burnham’s. He understood that the “architect is not only an artist ... but also an engineer, a man of science, a man of affairs.” He continued his definition – and this was after his split from Sullivan – by saying that the architect was not just a “clear thinker and brilliant writer.”⁶ This was a barb at Sullivan, implying that he was an artist but not an architect. Given the size and level of complexity of the new tall office buildings, it became clear that it was more than a single architect could handle. A contemporary architect observed that “individual have been supplanted. It now takes several men to make a good architect.”⁷ Architectural offices became larger and now often included structural engineers and technicians.

Early in their young careers, both Burnham and Sullivan had worked for William LeBaron Jenney, a Chicago architect trained as an engineer. Jenney designed the Home Insurance Building (1883–85), one of the earliest uses of steel, at least for part of its frame structure (Fig. 1). Although the technological problems of structure were solved rather quickly, the architect had a more difficult time with the facade. The structural metal frame was separate from the enclosing walls. This disengagement of enclosing envelope from structural support was liberating, but not easy. In the long tradition of masonry load bearing walls, structure and enclosure were one and the same; and with thousands of years of experience, there were hundreds of good examples of architectural composition and proportion. The tall building, with its new “curtain wall,” was a new artistic problem. Coupled with the need for light and the extreme proportions of the new building type, architects struggled to find appropriate articulation and expression. Chicago’s German speakers translated and published portions of the work of Gottfried Semper, whose writings provided theoretical direction, but the architectural problem of the facade was difficult to solve. Jenney’s solution, in its layer cake-like stacking, was on the whole unsatisfactory.



Figure 2: Exterior, Marshall Fields Wholesale Store (1885–87), Chicago, H. H. Richardson (demolished)



Figure 3: Exterior, Auditorium Building (1886–89), Chicago, Adler & Sullivan

A building in Chicago had an exemplary facade, by the master of the masonry load-bearing wall, the Boston-based architect H. H. Richardson. His Marshall Fields Wholesale Store (1885–87) (Fig. 2) provided architects with a useful facade strategy. The grouping of the windows of multiple stories under a single arch provided offered a way to rethink facade composition. This creates the illusion of shorter and more traditional scale of facade. This insight⁸ was evident on a Chicago street. Facade composition, as a cultural language, may begin in the context of structure and materials, but as an aesthetic form it accrues meaning unto itself, and in providing precedents for architects, develops a legacy of its own. The meaningfulness of Richardson’s facade was based on his preference for masonry architecture, but its appeal was broader and, as a model, was disengaged from structure by those who found it inspirational.

Richardson’s facade organization appears rather quickly in works by Adler & Sullivan and Burnham & Root.⁹ The most



Figure 4: Exterior, Guaranty Building (1894–96), Buffalo, N. Y., Adler & Sullivan

Figure 5: Exterior, The Rookery (1885–1888), Chicago, Burnham & Root



notable example is Adler & Sullivan's Auditorium Building (1886–89) in Chicago (Fig. 3).¹⁰

The Auditorium Building was commissioned by a consortium of businessmen to provide Chicago with a suitable cultural venue. This mixed use complex contained an important hotel and rental office space, whose revenues would support the Auditorium theater itself. The building's facade wraps its three street faces and unifies the different functions. Richardson's Marshall Field Wholesale Store provided Adler & Sullivan with a way of organizing this expansive facade into a compositional whole, but there were limits as to how far it could be expanded.

In the firm, it was Sullivan who was responsible for the design of facades, and he made a major breakthrough in facade design, first in the Wainwright Building (1890–92) in St. Louis and then in the Guaranty Building (1894–96) in Buffalo (Fig. 4).¹¹ The Wainwright was praised for its simple composition and plain treatment, for "its superior coherence and unity."¹² Frank Lloyd Wright would say it was "Sullivan's greatest moment – his greatest effort. The 'skyscraper' was a new thing under the sun, an entity with... beauty all its own".¹³ The Guaranty (later Prudential) Building developed this new idiom to greater perfection. One critic was enthralled: "I know of no steel-framed building in which the metallic construction is more palpably felt through the envelope of baked clay."¹⁴

In these facades, Sullivan departed from the Richardsonian model, and created a strategy that he explained was based on function. In his article "The Tall Office Building Artistically Considered,"¹⁵ he stated "form ever follows function." He divided the facade into three zones: the first two floors that relate to the street; the top floor; and the repetitive floors of offices that is the tall middle zone. It is in this middle zone that Sullivan offered a new strategy by grouping these floors all together, no matter how many, and by emphasizing the height of the building with uninterrupted piers that extended through the full height of the building's midsection.

What is curious about Sullivan's article is that he only minimally discusses function. He explains it in terms of the three zones, but he assumes that the plans have all been worked out already. This is curious in that the careful working out of a design to produce a maximum amount rental space was done in the arrangement of the building's plans. Sullivan addresses the modernism of the building in the artistic composition of the facade, but does not directly engage the modernity of this building type in its need to be an efficiently organized revenue-producer.

The architect who does take up this issue is Root of Burnham & Root, in his article "A Great Architectural Problem."¹⁶ He discusses the layouts of a series of offices around a light court based on the limits and orientation of the site, at the same time "enumerat[ing] some of the structural and commercial conditions which lie at the beginning of a typical architectural problem of the present." His article reveals the stringent limitations under which the architects worked in order to create a maximum of high-quality rentable space. Compared to facade composition, the development of the floor plan to provide adequate light and air has enjoyed somewhat less discussion in architectural histories.¹⁷

The Rookery (1885–1888) by Burnham & Root is a Chicago building that was noted by contemporaries for the development of its plan. Its exterior wall is still a combination of some load-bearing elements and a curtain wall on frame, and, earlier than the Auditorium, the facade is not so well composed (Fig. 5). However, the building was praised in its own time by architectural critic Montgomery Schuyler for the “Roman-largeness of its plan and the thoroughness with which it was carried out.”¹⁸ The first two floors take up the entire site, while the offices on the floors above are arrayed around a large open court (Figs. 6, 7). At the center on the ground floor is a two-story atrium covered with iron and glass and surrounded by an interior balcony giving access to the first (American second) floor (Fig. 8).

The Rookery’s plan proved enduring. The hollow square plan was subsequently widely used, by Burnham and Root as well as by others. So powerful was its effect in the Rookery, that Schuyler incorrectly attributed the invention of this plan type to Burnham and Root: If it is not so uniquely impressive now, it is because such a project, when it has once been successfully executed, becomes common property, and may be reproduced and varied until, much more than in purely artistic successes, the spectator is apt to forget the original inventor, and the fact that the arrangement he takes for granted was not always a commonplace but originally an individual invention.¹⁹ However incorrect the attribution of origin, the plan had great impact.

A comparison of the plan of the Rookery with that of the Guaranty-Prudential Building (Figs. 9, 10) in this regard may seem unfair as the Guaranty is so much smaller, but it is instructional nevertheless. In the upper floors, both plans respond to the same stringent requirements for light and air, requiring a court and limiting the depth of the offices from the exterior to the corridor wall.²⁰ But the differences in the ground floors is striking. The Rookery plan is organized around the atrium which provides a strong sense of place, a destination that is clear. Despite the relatively large amount of space (given its small size) devoted to public access, there is no sense of destination in the Guaranty.²¹ One is confronted almost immediately with the bank of elevators, and the rest of the ground floor public sequence has the spatial dimension of a corridor. The interior is disappointing; the surfaces are well-ornamented but the space is not well-defined.

This difference is even more apparent in section. Schuyler’s phrase “Roman largeness” characterizes the generosity of the sectional development of the Rookery as well (Fig. 11). The building possesses a well-developed spatial sequence of varying height and width, of compression and then release, into the spatial and visual expansion of the two-story atrium.

In the section of the Guaranty, the sensibility of the corridor prevails (Fig. 12). Although it is a generous single story, it is still just a single story. Despite Sullivan’s theory about how the first two stories both relate to the street, there is no connection of the first (American second) floor to that of the street level, no two-story space; no spatial connection. The floors remain separate. The only place the floor plate is cut is at the stairs where, by necessity, they must pass through from one floor to the next. Despite Sullivan’s statement that

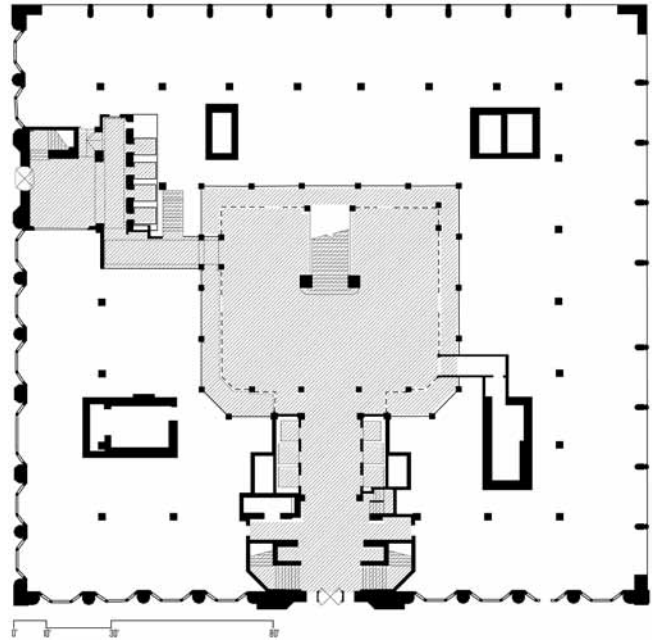


Figure 6: Ground floor plan, The Rookery (1885–1888), Chicago, Burnham & Root

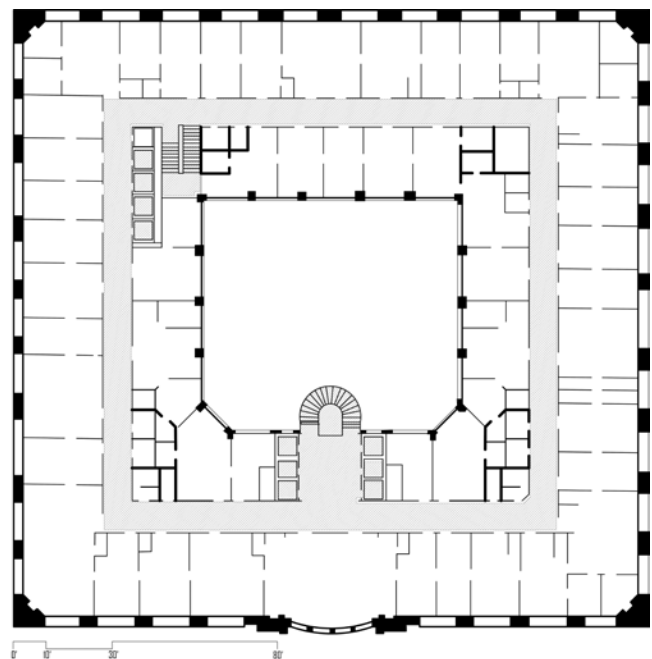


Figure 7: Typical floor plan, The Rookery (1885–1888), Chicago, Burnham & Root

the first two stories have a relation to the street, that have little relation to one another, and there is no real architectural difference between this first floor (American second floor) and the repetitive floors above.

The connect of the first two floors at the Rookery is well-developed and takes place mostly in the atrium, but also in the entry vestibule. In the atrium, the stair to the first (American second) floor is placed on axis with the entrance, providing direct access to the balcony that wraps the space. Desirable by virtue of its location in this major public space, this



Figure 8: Interior, *The Rookery* (1885–1888), Chicago, Burnham & Root

upper level of the atrium acts as a second ground floor by virtue of its clear visual connection and clear sequence. The dissolution of the floor plate here, and the sectional development, create a first (American second) floor that relates well to the street.²²

This sectional development and open center plan was used by Burnham & Root in the Masonic Temple Building completed after Root's death (1890–1892), and in D. H. Burnham & Co.'s Railway Exchange, later Santa Fe, Building (1903–04), both in Chicago. In the later Continental & Commercial National Bank, now 208 S. La Salle St., Chicago (1911–1914), Burnham makes the connection between the ground floor with a public passage and the grand two-story sky-lit banking hall above.²³ The continuity in the work of the firm is as striking as the lack of sectional development in the work of Adler & Sullivan. It is curious that the Rookery, a speculative office building, has a more elaborately developed section than the presumably more ceremonial Auditorium Building with its theater and hotel lobbies. Adler & Sullivan's Stock Exchange Building with its important trading room also lacked spatial connections between the levels of the building. One could well ask why Adler & Sullivan did not avail themselves of this architectural opportunity; but perhaps the more interesting question is how Burnham & Root were able to devote so much space (both in area and height) to non-rental public space in buildings designed to produce revenue.

The answer lies in the person of Owen Aldis and what Burnham in particular learned from him. Aldis was a property manager and building agent, notably for Peter and Shepherd Brooks, the investors who commissioned from Burnham and Root the Grannis Building (1880–81), the Montauk Block (1881–82), the Monadnock Building (1884–92), and the Rookery. By 1902, Aldis & Company produced and managed "more than one-fifth of Chicago's office space."²⁴

Burnham & Root's first major commission for an office building was the Grannis Block and in that context they learned a great deal about the requirements of a speculative office building and benefitted greatly from Aldis' knowledge. The architects organized this seven-story building around a light court and also attempted to create two first floors so that prime rental rates could be charged for both the low storefronts and the tall banking floor above them. Another look at the Rookery plan and section reveals how the architects were able to refine that strategy. In the Rookery, the ground floor was again devoted to retail. These tenants could be charged the highest rate as they had direct access to the exterior and pedestrian traffic, and some to the atrium as well. The floor above was designed as an American version of the *piano nobile*, the most important level of an urban building, and with the goal of almost duplicating the revenue the ground floor produced. Here the floor-to-ceiling height is greater than that of the ground floor and the rental spaces were larger. Banks were the major tenants of these spaces. This strategy also contributed to the life of the street as retail tends to enliven the sidewalk while banks, which do not engage the passer-by with window displays, were one floor up but still contributed to foot traffic.

The Rookery's well-developed spatial sequence of varying height and width is a marker of the building's and, by association, the tenants' status. Tenants were attracted by the way the atrium would act as their lobby and prolong the architectural promenade to their doors. The atrium created a desirable public space and provided a building lobby at a scale appropriate to the new tall office building and one that resonates at the urban level as well. It advertised the desirability of the building. The clients and architects strove not for the most economical solution in the meanest terms, but for something grander and more monumental that would yield higher revenues. The Rookery contained a considerable amount of "wasted" (that is to say, non-rentable) public space. Yet this unoccupied space had another function. Representative of decorum and status, space became an indicator of a building's place within the hierarchy of the city's structures.²⁵

This understanding of the larger picture comes from Aldis. The Rookery exemplifies one of his rules for Profitable Building Management: "Second class space costs as much to build as first class space. Therefore build no second class space."²⁶ Aldis was, of course, knowledgeable about the cost effectiveness of a plan, square footage returns, and the price of maintenance and upkeep. He knew, however, that such a focus on economics would not be enough to attract the best tenants. While most commercial buildings had minimal lobbies so that more space was devoted to the highest income-producing rentals like restaurants and shops, Aldis believed in making the public spaces high-quality, especially the lobby.²⁷ Aldis developed the fundamental criteria of office building design from the point of view of profitable economic return by emphasizing "good light and air, attractive lobbies and corridors, easy circulation, and good building service and maintenance." He preferred a large number of small tenants as they could be charged a higher rate per square foot.

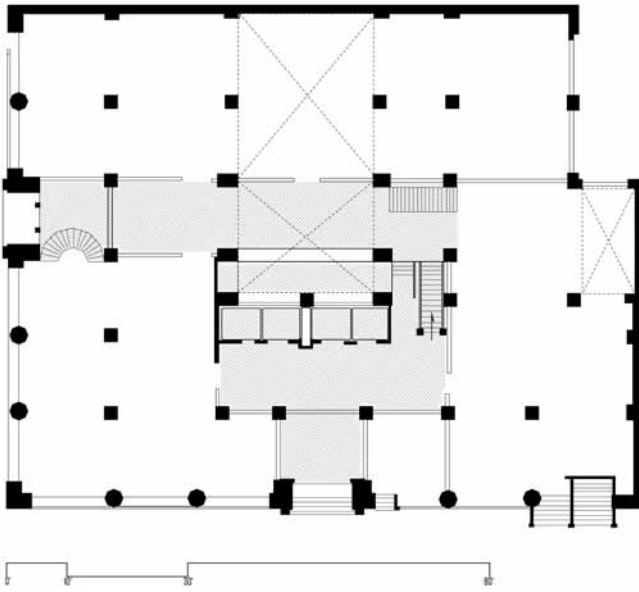


Figure 9: Ground floor plan, Guaranty Building (1894–96), Buffalo, N. Y., Adler & Sullivan

The rules of Profitable Building Management were written for the Marquette Building (1893–1895, addition 1906), Chicago, designed by Holabird & Roche (Fig. 13).²⁸ Here, although not as elaborate as the public space of the Rookery atrium, the plan reveals a vestibule, stairs to the first (American second) floor, and a spacious elevator lobby. What the plan does not reveal is that the elevator lobby is of double height, linking the two floors and relating the upper level to the lower. In its own time the building was noted as having fulfilled both the demands of artistry and commerce.²⁹

Aldis advocated high-quality interiors, and tenants began to clamor for them. Perhaps in reaction to the bald specula-

Figure 10: Typical floor plan, Guaranty Building (1894–96), Buffalo, N. Y., Adler & Sullivan

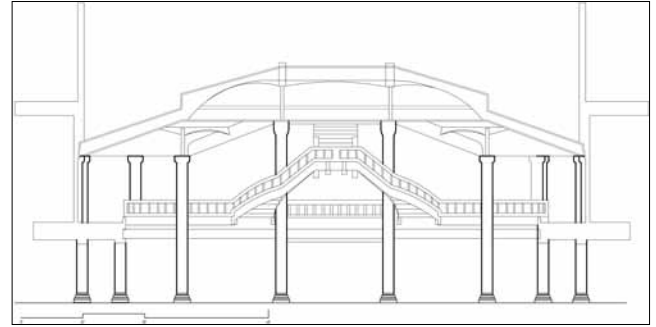
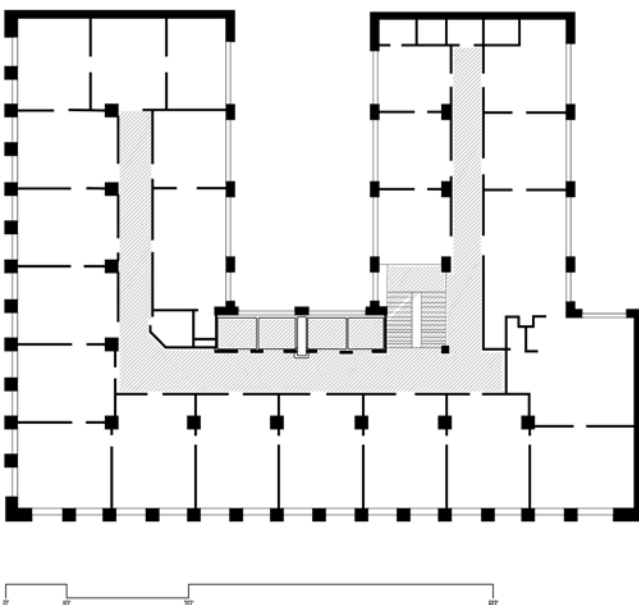


Figure 11: Section through ground floor, The Rookery (1885–1888), Chicago, Burnham & Root

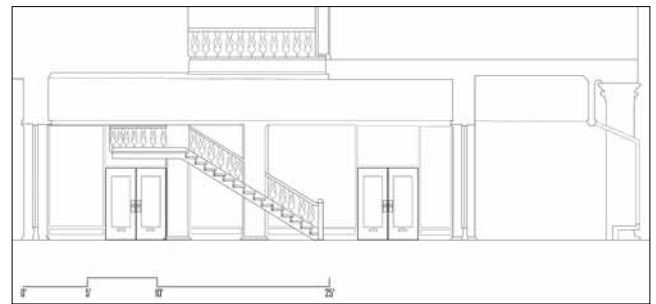
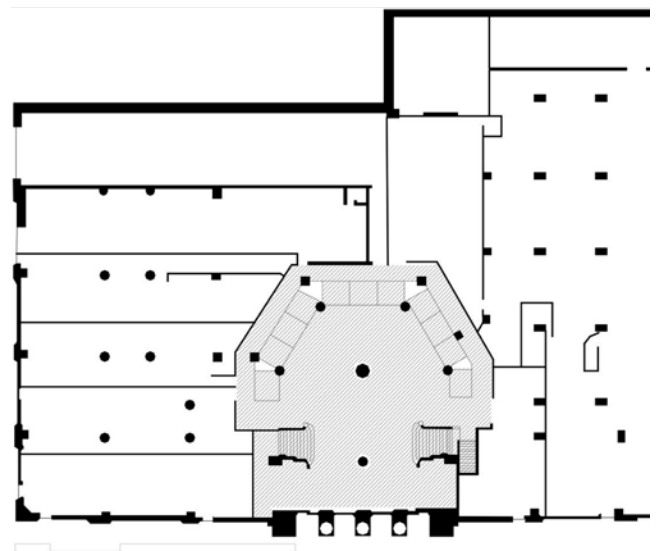


Figure 12: Section through ground floor, Guaranty Building (1894–96), Buffalo, N. Y., Adler & Sullivan

tive quality of earlier, ornamentation as well as good quality materials and finishes were demanded for buildings of the first class rental category. There was a recognized commercial value to beauty; the economic problem needed an artistic solution.³⁰

The tall speculative office building was part of the major changes that occurred in architecture by the end of the

Figure 13: Ground floor plan, Marquette Building (1893–1895, addition 1906), Chicago, Holabird & Roche



19th century. An architectural writer remarked at the time that: Current American architecture is not a matter of art, but of business. A building must pay or there will be no investor ready with the money to meet its cost. This is at once the curse and the glory of American architecture.³¹ Another writer remarked how “in this strictly utilitarian building the requirements are imposed with a stringency elsewhere unknown in the same degree,” and yet, it was, he thought, “very greatly to the advantage of the architecture.” In particular, he recognized the “very great share” Chicago businessman (even more than New York) had in the “evolution of commercial architecture” through the insistence on accepting functional and economic requirements.³² All recognized the changing demands on the profession by the effects on modernity, at the same time there were calls for a contemporary American architecture mostly in terms of a new style. In succeeding years, in art and architectural histories, the meeting of the new demands of modernity was too often separated from the appearance of modernity, or modernism.

That separation has tended to extract architecture from its context. This artificial separation contradicts the fact that our buildings are deeply a part of our entire cultural, social, political, and economic contexts. They are not solely artistic artifacts. And as large and largely permanent construction, architecture has shaped our cities. And, perhaps most importantly, such buildings are a repository of architectural and urban knowledge, waiting to be rediscovered and to correct our path when we go astray in the design of our human environment.

Abstract

Das große Bürogebäude im frühen Chicago aus künstlerischer und funktionaler Sicht

Das große Bürogebäude als Spekulationsobjekt verwies schon per definitionem auf die Aspekte Höhe und Rentabilität in ihrer extremen Form. Es stellte die Architekten in puncto Bauentwurf und -ausführung vor neue Herausforderungen und architektonische Prinzipien und Dimensionen, die sich über Jahrhunderte für fünf- oder sechsgeschossige Strukturen entwickelt hatten, wurden durch die hohe Fassade eines solchen Gebäudes gesprengt. Die fein abstimmbare Quadratmetermiete, die dann mit Geschossflächen und Etagen multipliziert wurde, verlangte erstmals eine Flächenplanung, über die genau Rechenschaft abzulegen war.

Diese zwei wichtigen Aspekte – Fassade und Grundriss – in der Entwicklung der großen Bürogebäude im Chicago des späten 19. und sehr frühen 20. Jahrhunderts sind Thema dieses Vortrags. Im Mittelpunkt der Diskussion steht dabei hauptsächlich die Arbeit der Firmen Adler & Sullivan sowie Burnham & Root (später D. H. Burnham & Co.).

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Sources of illustrations

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- ¹ Chicago was incorporated in 1833. By 1850, the city had less than 30,000 inhabitants, but between 1850 and 1870, the population grew tenfold, to about 300,000 inhabitants. It grew to 1,000,000 inhabitants by 1890, and by 1900 the population had reached 1,700,000. Some of this growth, especially in the period from 1880 to 1890, was due to the annexation of adjacent townships. During that period, the increase of population within the old city limits was 57%, but in the increase from annexation was 650%. MAYER and WADE, *Chicago*, 30, 35 & 176; GILBERT, *Perfect Cities*, 27.
- ² I am referring to the first century BCE Roman architect Vitruvius whose definition of architecture, as *utilitas*, *firmitas*, and *venustas*, was translated into English in the early 17th century by Sir Henry Wotton, as *commodity*, *firmness* and *delight*.
- ³ SULLIVAN, *Autobiography*, 255–257. The partnership lasted until 1895. Adler died in 1900. Sullivan faced increasing difficulties after the split but practiced until 1922. He died in 1924.
- ⁴ WIGHT, „Burnham: An Appreciation,“ 178. Their partnership and friendship ended with Root’s death in 1891. Burnham continued practicing as D. H. Burnham & Co. until his death in 1912.
- ⁵ SULLIVAN, *Autobiography*, 285–286, 314. WOODS, *From Craft to Profession*, 118–120. Casting this same trait in a different light, a former employee recalled that “Burnham was one of the first architects to build up a highly efficient and well-equipped office organization to satisfy the needs of a rapidly increasing business.” Burnham helped engineered the transition to the modern large architectural practice. REBORI, “Work of Burnham & Root,” 34.
- ⁶ Quoted in TWOMBLY, *Sullivan: Life & Work*, 331, from a paper Adler delivered before the American Institute of Architects in October 1896.
- ⁷ This was the East Coast architect Robert S. Peabody. See WOODS, 138; also 161.
- ⁸ I am not claiming that it is the first or the only such insight; only that it was powerful.
- ⁹ Other examples are the McCormick Offices and Warehouse (1886) by Burnham & Root, and the Walker Warehouse (1888–89) by Adler & Sullivan, both in Chicago.
- ¹⁰ According to Adler, the facade design was suggested by the client, the Chicago Grand Auditorium Association. FREI, *Sullivan*, 68, citing Adler’s remarks in *Architectural Record*, 1892.
- ¹¹ Although neither of these buildings are in Chicago, they were produced by Chicago architects and are considered among the best examples of what is known as the Chicago school.
- ¹² SCHUYLER, „Architecture Chicago: Adler & Sullivan“ in JORDY & COE, *American Architecture*, 390.
- ¹³ Quoted in TWOMBLY, *Sullivan: Life & Work*, 285.
- ¹⁴ SCHUYLER, „Architecture in Chicago: Adler & Sullivan“ in JORDY & COE, *American Architecture*, 393. The whole quotation: “The Guaranty building at Buffalo is in its scheme a variant upon that of the Wainwright, the main difference being the substitution of terra cotta for the masonry of the basement and for the brickwork of the superstructure. The more facile material is recognized throughout in the treatment by reticulations of surface ornament differing in density and character of design, according to the function of the surface treated and to the function of what is behind it. I know of no steel-framed building in which the metallic construction is more palpably felt through the envelope of baked clay.”
- ¹⁵ SULLIVAN, „The Tall Office Building Artistically Considered“ was first published in *Lippincott’s Magazine* (March 1896) and then in *Inland Architect & News Record* (May 1896). It is reprinted in TWOMBLY, ed., *Sullivan: Public Papers*, 103–13, among other places. The quoted phrase appears on pp. 111 & 112.
- ¹⁶ ROOT, „A Great Architectural Problem,“ was published in *The Inland Architect and News Record*, XV:5 (June 1890) 67–71; and reprinted in HOFFMANN, ed., *Meanings of Architecture*, 130–42. The quotation is on 133.
- ¹⁷ WILLIS, in *Form Follows Finance*, has given this issue greater publicity, but it has always been the concern of historian Robert BRUEGMANN, see especially his *Architects of the City*.
- ¹⁸ SCHUYLER, „Great American Architects – D. H. Burnham & Co.,“ 50.
- ¹⁹ SCHUYLER, „Great American Architects – D. H. Burnham & Co.,“ 53.
- ²⁰ A major planning problem for the tall office building was the penetration of sunlight into interior work spaces. This limited office depth and arrangement. Given standard floor-to-ceiling heights of ten to twelve feet, the maximum depth from exterior window to corridor wall ranged between twenty and twenty-eight feet. Despite being a new technological wonder made possible by gas and later electrical lights, and by mechanical heating and sometimes

cooling systems, the tall office building still relied heavily on natural light and air. Cooling was not air conditioning, which was a later invention. WILLIS, *Form Follows Finance*, 24–27; BLUESTONE, *Constructing Chicago*, 132.

²¹ ADLER & SULLIVAN'S plan for the earlier Wainwright Building was very similar to that of the Guaranty.

²² Unfortunately Frank Lloyd Wright's renovation of the interior (1905–07) destroyed some aspects of the original unifying lightness and airiness that Root achieved with the use of open ironwork. Root's floor design has been reproduced in the latest restoration. See SALTON, „Burnham and Root and the Rookery,“ in GARNER, ed., *Midwest in American Architecture*, 76–97.

²³ That Burnham continues with this strategy after Root's death has allowed me to argue for Burnham's role in the design of the firm's buildings. See SCHAFFER, Daniel H. Burnham.

²⁴ BERGER, *They Built Chicago*, 39.

²⁵ BRUEGMANN, *Architects of the City*, 70 & 114–15; BLUESTONE, *Constructing Chicago*, 140. See also CHAPPELL, *Graham, Anderson, Probst and White*, 2, for another discussion of building hierarchy.

²⁶ Aldis' rules for Profitable Building Management: “First: The office that gives up the most for light and air is the best investment. Second: Second-class space costs as much to build and operate as first-class space. Therefore, build no second-class space. Third: The parts every person entering sees must make a lasting impres-

sion. Entrance, first floor lobby, elevator cabs, elevator service, public corridors, toilet rooms must be very good. Fourth: Generally, office space should be about 24 feet deep from good light. Fifth: Operating expenses must be constantly borne in mind. Use proper materials and details to simplify the work. Sixth: Carefully consider and provide for changes in location of corridor doors, partitions, light, plumbing and telephones. Seventh: Arrange typical layout for intensive use. A large number of small tenants is more desirable than large space for large tenants because: a) A higher rate per square foot can be added for small tenants. b) They do not move in a body and leave the building with a large vacant space when hard times hit. c) They do not swamp your elevators by coming and going by the clock. Eighth: Upkeep of an office is most important. Janitor service must be of high quality, elevator operators of good personality. Management progressive.” SCHULTZ and SIMMONS, *Offices in the Sky*, 33–34.

²⁷ BERGER, *They Built Chicago*, 39–48

²⁸ Martin ROCHE worked for Jenney at the same time as Sullivan.

²⁹ BRUEGMANN, *Architects of the City*, 124.

³⁰ Quoted in WILLIS, *Form Follows Finance*, 29–30. See also BLUESTONE, *Constructing Chicago*, 128–132.

³¹ Barr Ferre in an address to the AIA convention in 1893, quoted in WILLIS, *Form Follows Finance*, 15.

³² SCHUYLER, „Great American Architects – Architecture in Chicago,“ 8.