The École Centrale and Modern Architecture: The Education of William Le Baron Jenney

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LOUIS SULLIVAN described William Le Baron Jenney as ". . . not an architect except by courtesy of the term."[1] With certain modifications this opinion has persisted until today. Sigfried Giedion[2] and Carl Condit[3] commented upon the aesthetic potential inherent in Jenney's "invention" of skeleton construction. Many writers, however, have tended to consider the superb functional design of some of his buildings as a by-product of architectural ignorance. Most that has been written about Jenney since his death in 1907 has largely concerned his great technical innovation in the Home Insurance Building built in Chicago in 1885. The demolition of this building in 1931 stimulated much speculation as to whether or not it was the first skyscraper ever erected.[4] Even Jenney's close friend, the Chicago contractor Henry Ericson, wrote only of Jenney's fine character and his contributions to the technology of building.[5] Despite some dissenters the majority of authorities have concluded that Jenney's use of the skeleton method of construction in the Home Insurance Building resulted in the first great step toward the modern tall building.[6] If it was not a skyscraper, it was at least a "protoskyscraper."[7] The emphasis has thus been upon Jenney the structural engineer rather than Jenney the architect. The "trend toward . . . pure forms"[8] which Giedion noted in his buildings has been interpreted as a triumph of the vernacular[9] or not as art at all.[10]

I would like to express my thanks to the many individuals who aided me in the writing of the thesis of which this article is a distillation. I am especially grateful to Professors Leonard K. Eaton and George H. Forsyth of the University of Michigan. Others who have advised me include Carl W. Condit, Peter Collins, Turpin C. Bannister, Bruce Catton, Marcel Brion, Pierre Francastel, and Louis Hautecoeur. M. Boucheron and M. Vivier, director and librarian of the *École centrale*, were especially cooperative in opening their archives and library to me. The greatest support was offered by the late Miss Elizabeth Mundie, niece of Major Jenney and daughter of his partner. She was a great Lady. I dedicate this article to her memory.

1. Louis Sullivan, *Autobiography of an Idea* (New York, 1956), 203–204.

2. Sigfried Giedion, *Space, Time and Architecture* (New York, 1957), pp. 381–383.

3. Carl W. Condit, *The Rise of the Skyscraper* (Chicago), pp. 135–136, and *The Chicago School of Architecture* (Chicago, 1964), pp. 89–90.

4. The question of Jenney's invention of the skyscraper has come up several times. His innovations in the Home Insurance Building were thought significant enough for him to publish them in the *Sanitary Engineer*, XIII (1885), 32–33. In the 27 June 1896 edition of the *Engineering Record*, the Bessemer Steamship Co. stated the desire to name a ship after the inventor of "cage" construction. The 11 July edition of the journal carried a number of replies. Though George B. Post of New York sought the honor, the weight of opinion supported Jenney. A committee appointed by the Marshall Field Estate in 1931 decided the primacy of the Home Insurance Building over the Tacoma Building (1887–1889) by Holabird and Roche. Thomas E. Talmadge, "Was the Home Insurance Building the First Skyscraper of Skeleton Construction?," *Architectural Record*, LXXVI (1934), 113–118. Roll No. 23 of the Chicago Microfilm Project of the Burnham Library, Chicago, contains almost fifty frames of letters and articles from the daily press pertaining to the Home Insurance and Tacoma Buildings. They were the result of the inquiries of Mr. Henry Penn made in 1931 for the American Institute for Steel Construction. The claims of Leroy Buffington have been completely discounted. Dimitris Tselos, "The Enigma of Buffington's Skyscraper," *Art Bulletin*, XXVI (1944), 3–12, and Muriel B. Christison, *Art Bulletin*, XXVI (1944), 13–24. The contemporary source which came closest to a purely aesthetic appreciation of Jenney's work was the anonymous *Industrial Chicago*, I (Chicago, 1891), 205.

5. Henry Ericsson, *Sixty Years a Builder* (Chicago, 1942), pp. 106, 217–222.

6. Irving K. Pond, "Neither a Skyscraper nor of Skeleton Construction," *Architectural Record*, LXXVI (1934), 18, and William G. Purcell, "First Skyscraper," *Northwest Architect*, XVII (1953), 5.

7. Carson B. Webster, "The Skyscraper: Logical and Historical Considerations," *JSAH*, XVIII (1959), 138–139.

8. Giedion, *Space, Time, and Architecture*, p. 381.

9. John A. Kouwenhoven, *Made in America* (New York, 1948), pp. 71–72.

10. Wayne Andrews, *Architecture, Ambition and Americans* (New York, 1958), p. 208.

Jenney's case is not quite so simple. All descriptions of him reveal a cultivated and refined gentleman aware of the rich currents of the nineteenth century. His writings make reference to such diverse theorists as Ruskin, Garbett, Fergusson, and Viollet-le-Duc.[11] He was interested in architectural theory and history and taught these subjects at the University of Michigan in 1777.[12] Yet, even among Chicago architects of the 1870s, 80s, and 90s his major work remains unique.[13] It was devoid of the mediaeval reference to which John Wellborn Root and Louis Sullivan often adhered.

The factors which acted upon Jenney's architecture were diverse, but without doubt the most important was the experience of a French education. Although this article is concerned almost exclusively with this influence his prior environment should be mentioned. He was born in Fairhaven, Massachusetts, in 1832. He attended Phillips Academy and the Lawrence Scientific School of Harvard University.[14]

Fairhaven was a whaling and shipping center. Jenney, as the son of a prosperous whaling ship owner, savored this vital milieu completely.[15] In 1849 he embarked on a voyage to California, the Philippines, and the South Seas. It was during his visit to the Philippines that he decided to become a civil engineer.[16] Here he also seems to have been struck by the native method of building. According to his future partner, William Mundie, he was impressed by the flexibility and durability of huts built with a light bamboo frame.[17] More important than the sources of the idea of skeleton construction, Jenney's observations complemented certain attitudes he would encounter in later years. Following in the wake of the late-eighteenth-century theorist Abbé Laugier, architectural writers were often fascinated by primitive building. Durand, Viollet-le-Duc, and others believed even the simple "cabin" was architecture because it was stripped to its essential elements.[18] It is important to note that Jenney, alone among important nineteenth-century architects, came into direct contact with the architecture of primitive societies.

Jenney returned home in 1851 and began his studies at Harvard's Lawrence Scientific School. Though founded as an engineering institution the funds donated by Abbott Lawrence were largely diverted to support the biological researches of Louis Agassiz.[19] Jenney felt that the education he was being given was not adequate. On the advice of several friends who had preceded him, he decided to enroll in the *École centrale des arts et manufactures* in Paris. He was accepted in the fall of 1853.[20] The following rather correct and laconic letter of recommendation hints at a possibly cool relationship between Jenney and his professor of engineering at the Lawrence Scientific School. Professor Eustis wrote:[21]

11. The theoretical side of Jenney's writing has been ignored. He wrote only one book (with his partner Sanford Loring), *Principles and Practice of Architecture* (Chicago and Cleveland, 1869). In it he makes reference to a number of authors including those mentioned above. The most interesting was his discussion of Edward Lacy Garbett's *Rudimentary Treatise on the Principles of Design* (London, 1850). Although Jenney did not cite the most revolutionary passages of the book (pp. 132–134) he certainly was aware of Garbett's plea for a "Tensile" architecture deriving from the use of new materials. The influence of Garbett in America has been documented, but his direct influence on Jenney seems to have been missed. Robert W. Winter, "Fergusson and Garbett in American Architectural Theory," *JSAH*, XVII (1958), 25–29. Viollet-le-Duc was the most persistent influence. Jenney undoubtedly became acquainted with his writings during his two visits to Paris in 1853–1856 and 1858–1859. Jenney moved in a cosmopolitan circle which included Whistler and du Maurier and thus would have come into contact with the intellectual cross-currents of Paris. He wrote of his experiences in "Whistler and Old Sandy in the Fifties," *American Architect and Building News*, LXI (1898), 4–5. Jenney requested Viollet-le-Duc's *Entretiens* for the text of his course at the University of Michigan in 1877, letter: W. L. B. Jenney to President James B. Angell (8 Aug. 1876), *University of Michigan Historical Collection*. Jenney's dependence on Viollet-le-Duc is especially evident in his "Lectures on Architecture," *Inland Architect and News Record*, I (1883–1884), 18ff. He referred to Viollet-le-Duc's *Habitations of Man* (Paris, 1876) and Fergusson's *History of Architecture* (London, 1867) in *Inland Architect and News Record*, II (1884), 159, as his sources.

12. *Calendar of the University of Michigan* (Ann Arbor, 1875–1876), pp. 1–2.

13. In his non-commercial buildings, Jenney evolved from the Gothic Revival, through the Romanesque Revival to the Shingle Style. He felt that each type of structure should develop forms natural to it. Hence forms appropriate to public buildings did not belong to homes. W. L. B. Jenney, "A Reform in Suburban Dwellings," *Inland Architect and News Record* (1882), 2–3.

14. William Le Baron Jenney, "Autobiography," pp. 1–3. A typed MS found in his Scrapbook. Chicago Microfilm Project, Burnham Library.

15. Fairhaven was the same economic entity as New Bedford. They were politically one until the War of 1812. The atmosphere of this area and time is described by Herman Melville in *Moby Dick*. Jenney's proximity to ships recalls the functionalism of Horatio Greenough, *Form and Function* (New York, 1957), pp. 59–61. The richness of architectural thinking in the New England of Jenney's youth can be found in Charles R. Metzer, *Emerson and Greenough* (Berkeley, 1954) and Robert B. Shaffer, "Emerson and His Circle, Advocates of Functionalism," *JSAH*, VII (1949), 17–20.

16. Jenney, "Autobiography," p. 2.

17. William Mundie, "Skeleton Construction, Its Origin and Development Applied to Architecture" (1932), Part I, p. 10. This is an unpublished MS found in Roll No. 23, Chicago Microfilm Project, Burnham Library.

18. Peter Collins, *Changing Ideals in Modern Architecture 1750–1950* (London, 1966), pp. 97, 200–201, and Louis Hautecoeur, *Histoire de l'architecture classique en France*, V (1953), 261.

19. *Engineering News* (May 5, 1892), 459–460, and James L. Love, *Lawrence Scientific School in the Harvard University* (Burlington, 1944), pp. 4–6.

20. Jenney, "Autobiography," p. 3.

21. Archives of the *École centrale des arts et manufactures, Promotion de 1853*.

Dear Sirs:

Mr. Jenney has been a pupil of the Engineering Department of the Lawrence Scientific School of Harvard University, during the past year. He has completed the course in Analytical and Descriptive Geometry and a part of the prescribed course of Differential and Integral Calculus. He has also made some progress in drawing. His deportment, industry, and attention to all the prescribed duties have been perfectly satisfactory.

H. L. Eustis
Professor Eng. Law. Sci. School

Cambridge, Mass.
June 11th, 1853

The search for a useful education led Jenney to France. England, though she was the mother of the Industrial Revolution, did not possess a fully successful system of technical instruction.[22] Only France had a long tradition of engineering schools. The profession of civil engineer had its origin in the military engineer and the development of technical schools during the eighteenth century and the Revolutionary period. The most famous among them was the *École polytechnique*. This would seem to have been the most obvious choice for Jenney. At this time, however, it was largely restricted to Frenchmen because its graduates were destined for either the military or the civil service.[23] Moreover, the nature of the school had changed since its creation during the Revolution. Over the years its instruction tended to become progressively more theoretical and less practical. According to one critic the curriculum was more appropriate to an *École normale supérieure*.[24] The orientation of the courses and the mental approach therefore had a distinct rationalist, eighteenth-century cast. It was designed primarily to form a foundation for the more practical *Écoles d'application*.[25]

The *École centrale* was founded in 1829 as a private institution. Its object was to provide remedies for the industrial impotence of post-Napoleonic France. In this regard the founders, manufacturers, and technocrats sought to imitate the type of engineer which had developed in England during the Industrial Revolution.[26] Unlike the French engineer, the Englishman was not tied to a governmental bureaucracy, but was rather associated with the *laissez faire* capitalism of nineteenth-century Britain. A descendant of the eighteenth-century millwright,[27] he was able empirically to evolve solutions to complex industrial problems. With characteristic French genius the founders of the *École centrale* were able to institutionalize the variegated experiences of the English. That they did so well was illustrated by the British sense of alarm. The progress shown by the French at the World's Fair of 1851 made the English painfully aware how retarded their methods were becoming. One of the Commissioners of the Fair wrote:

> . . . Until our schools accept as a living faith that a study of God's work is more fitted to increase the resources of the nation than a study of the amours of Jupiter or of Venus, our industrial colleges will make no material headway against those on the continent. In Paris we find a Central College of Manufactures, into which the students enter at an average of nineteen years, already well trained in the elements of science, and going there to be taught how to use these elements for industrial application. Three hundred of the best youth of France are annually receiving at this College the most elaborate education, and the best proof of its practical value is the great demand among manufacturers for its pupils, a diploma from it being equivalent to assure success in life. Can you wonder at the progress made by France industrially, when she pours every year an hundred and fifty of these highly educated manufacturers into the provinces.[28]

Thus the fame of the school spread. By 1853 six hundred foreign students had attended the school. They came from every part of the world, including ". . . *les deux Amériques*." It was claimed most western nations, including the United States, had schools which were patterned after the *École centrale*.[29]

Admission to the school was relatively easy, but the mortality rate was quite high. Of the *Promotion de 1853*,[30] the class to which Jenney belonged, only sixty-six of an original one hundred and seventy-six were graduated. Most significant of the alumni was Gustave Eiffel, who, as a member of the *Promotion de 1852*, overlapped Jenney's stay at the institution.[31]

22. Walter H. G. Armytage, *A Social History of Engineering* (London, 1961), pp. 102, 230.

23. Gaston Pinet, *Histoire de l'École polytechnique* (Paris, 1887), pp. 402–431.

24. Francis Pothier, *Histoire de l'École centrale* (Paris, 1887), pp. 7–8.

25. Frederick B. Artz, *The Development of Technical Education in France 1500–1850* (Cambridge, Mass., 1966), p. 158.

26. Maurice Donnay, *Nos grandes écoles, Centrale* (Paris, 1930), p. 7. The *École centrale* came under government control in 1857 and has since been part of the French University system. Donnay, p. 45.

27. Sir William Fairbairn, *Treatise on Mill and Mill Work*, II (London, 1865), ix.

28. Lyon Playfair, "Industrial Education," *Lectures on the Result of the Exhibition* (London and Philadelphia, 1852), pp. 142–146.

29. *Notice sur l'École centrale des arts et manufactures* (Paris, 1865), p. 21.

30. French students are grouped according to their date of entrance.

31. There has been some doubt expressed about the relationship of French and American building. James Marston Fitch, *American Building* (Cambridge, Mass., 1948), pp. 95–96. An interchange existed from the beginning, however. American wooden and metal bridge construction was admired and taught in France. Louis Charles Mary, *Cours de routes* (Paris, 1855–1856), pp. 178–193. Gustave Eiffel was much influenced by the American system of bridge building. Louis Fuquier, *Les nouvelles conquêtes de la science* (Paris, 188–), pp. 17–20.

The *École centrale* has preserved none of Jenney's drawings and other work, but his entrance examinations, his records, and list of the courses and subjects that he studied are still on file in the archives. Also preserved are the lecture notes of Jenney's professor of architecture, one M. Louis Charles Mary (1791–1870). It is my contention that a combination of the engineering courses and the doctrines taught by M. Mary formed the basis of Jenney's architectural style.

There were four areas of specialization—Mechanical Engineering, Metallurgy, Chemical Engineering, and finally Civil Engineering. Jenney chose the latter category, but specialization came only in the last two years. Even during these last two years the philosophy of the school demanded that the engineer comprehend the totality of his profession. In the words of one of the school's publications, "All the courses of the school form, in reality, only one and the same course; industrial science is one. . . ."[32]

The implications for the future become obvious when it is realized that Jenney was given training in engineering and architecture at the same time. One finds, therefore, the gradual dissolution of the academic division of the building art into architecture and construction. Jenney was to absorb a system which treated structure and design as interrelated. Although M. Mary wrote that the architectural course offered was not sufficiently thorough for a professional architect,[33] the school administration felt its program was broad enough for a student to change his specialty after graduation. Indeed, this was often the case. By 1865 fifty-five alumni had chosen the title architect to signify their profession.[34] The directory of the school, *Les anciens élèves de l'École centrale*, for 1889 listed William Le Baron Jenney as an architect and landscape engineer. In later years Jenney was quite aware of the conflicts he found in contemporary architecture and the healing he sought no doubt resulted from the instruction he had received in Paris. This was at least implied when he wrote:

> The best detail drawings I have seen are those of French architects. I do not mean those from the students of the *École des beaux arts*, who have little or no practice. Far from it, for that is essentially an art school, of which I once heard an old French engineer remark, "the students of the *École des beaux arts* make beautiful drawings but chances are they are entirely unconstructible." I refer to details from the offices of French architects in successful practice. Everything is thereon shown or explained, by elevations, sections, bits of perspective, or by written explanations.[35]

Both the methods of teaching and the courses studied were important. As stated previously no drawing or similar exercise of Jenney's survives, but the list of projects he was assigned still exists. They included a resistance of materials project, topographical designs (connected with a course in landscape engineering), a design for a schoolhouse, a hydraulic project, a steam heating system, a lifting apparatus, and a country house in the second year. During the third year he was given projects for a hot air furnace, a heating system for a hospital, a design for a public bath, an incinerator, a tunnel, two roads, a water system, a railroad station, and a wooden frame bridge.[36]

These projects were attached to individual courses. In addition to these, was a group of studies known as "*Travail des vacances*."[37] This mode of instruction was perhaps one of the most original innovations of the school. It propelled the builder out of the vague theory of the classroom into actual practice in the field. The student was brought into contact with a vast variety of structures such as bridges, canals, railroads, and factories. He was required to subject the object under consideration to an intensive analysis. An analysis, one might add, which extended beyond purely functional aspects to encompass social and economic concerns. This was in line with the general philosophy of the school. Its students and faculty had taken part in the social upheavals of 1830 and 1848 in order that they be permitted to apply their technical skills toward the general good of society.[38]

The study of factories was particularly interesting because these buildings anticipated the problems that Jenney was to encounter in Chicago. The student was to make a sketch of the general disposition of the factory and its outbuildings. He was to observe the placement of the machines and their power sources. The nature and the price per unit of the product was to be determined as was the cost and quality of the labor involved. The relation to the neighboring cities was considered both with respect to markets and labor supply. Directions for the *Travail des vacances* cau-

32. *Notice sur l'École centrale des arts et manufactures*, pp. 10–11.

33. Louis Charles Mary, *Cours d'architecture* (Paris, 1852–1853), pp. 2–3.

34. *Notice sur l'École centrale des arts et manufactures*, p. 8.

35. William Le Baron Jenney, "A Few Practical Hints," *Inland Architect and News Record*, XIII (1889), 9.

36. Archives of the *École centrale des arts et manufactures*, *Promotion de 1853*.

37. Pothier, *Histoire de l'École centrale*, p. 191.

38. Donnay, *Nos grandes écoles, Centrale*, p. 12. Most French engineers and technocrats seem to have been attracted to Fourier and other brands of Utopian Socialism, Artz, *The Development of Technical Education in France 1500–1850*, p. 242. Jenney was a member of the Republican Union Club of Chicago. Elmer C. Jensen, "Origin of the Skyscraper," *Union League Men and Events*, XXVII (1950), 2. He apparently was in the liberal wing of the party because the social thought of the school continued in a concern for workers' housing, *Principles and Practice of Architecture*, pp. 45–48, and in an attack on the Steel Trust, "American and Foreign Structural Steel," *Inland Architect and News Record*, XV (1890), 83–84.

tioned the student not to forget the conditions of the workers—their housing, safety, and health.

The building was studied in relation to its ultimate use. It was considered as an organic unit, developing its form from the interrelationship between men and the machines which it enclosed. In this sense the building could be thought of as a great machine itself. Significantly, human factors were considered in the evaluation. This was true not only in computing profit in terms of man hours, but also in relation to the well-being of the employees.[39]

That these necessities should determine the aesthetic of a building was even then dimly apparent. In this respect we are fortunate because the lecture notes of Jenney's professor of architecture survive. The notes are valuable, not only for a study of Jenney's work in particular, but also for a knowledge of the development of nineteenth-century architectural education. These notes, in addition to expounding general principles, give an insight into the manner in which Jenney was led to solve the problems that were to confront him in Chicago years later.

The course in architecture was given by M. Louis Charles Mary. He graduated in 1810 from the *École polytechnique*. It is significant that he was graduated before the extensive curriculum changes discussed above. At the *École centrale* he both lectured and conducted visitations to factories and public works where he elaborated points that he had made in the amphitheater. M. Mary's philosophy and works "... were always conceived from the point of view of wise economy which did not seek prestige and proportioned the expense to the results he wished to obtain."[40]

M. Mary proclaimed that architecture had a twofold object; the "composition" and "construction" of edifices. The first was the disposition of the different parts of a building, the exterior form and all that related to the decoration. Construction, on the other hand, was the execution of a building. Here the proportions and other matters were determined not by caprice but by the available materials which were appropriate to the nature and character of the edifice. One senses an engineer's mild contempt for the architect's trade as it was then practiced when he wrote, "In composition one is guided more or less by what has been done; it is therefore an art of imitation." An architect could learn to compose merely through the study of good models and by choosing those which might be most appropriate for a given climate or set of habits and tastes. These styles which, "... *on a nommé vulgairement architecture*" were considered by the professor as extremely mutable and variable.[41]

Architecture, as opposed to engineering, was nevertheless included in the school's curriculum. The intent, however, was not quite that of the *École des beaux arts* even though a certain amount of time was expended on the orders and Vitruvian proportion to equip the builder to meet any possible situation. The orthodox instruction was kept to a minimum and instead of decorative details the architectural course emphasized general rules common to all architecture whether a "cabin or a palace."[42] These principles were to produce buildings which could satisfy both the eyes and practical need. To accomplish this end it was necessary to study in detail the nature of the constituent parts of structure. M. Mary outlined three sources for architectural forms. The three sources were:

1. Those which evolved from the nature of the material and the use to which this material is destined.
2. Those which result from habit or the influence of the Greeks.
3. Those which are motivated by the use of the edifice.[43]

The first and third statements could have been written by any contemporary functionalist architect. The second is more troublesome. Today we tend to feel that the use of historical motifs in architecture is in conflict with functionalism. M. Mary, however, looked upon the classical not so much as the employment of Greek and Roman ornament, but as a system or approach to architectural problems.

He wrote that walls were thickened at certain places with buttresses or pilasters not because this was done in antiquity, but because these areas were responding to heavier loads. Pilasters or engaged columns were appropriate only in more pretentious buildings. Symmetrical designs were inherently easier to plan, build, and operate. Thus in an industrial building or complex "... the director of the establishment can embrace the whole area with a single glance."[44] A strict almost Palladian control was necessary. For this reason the architect or engineer was instructed to use a *papier quadrillé* or squared paper. Its employment facilitated a good disposition of the project's ground plan and could be used for the composition of the formal elements in a balanced and rational manner.[45]

Though present, classical ornament was to be subsidiary to a system of rational control. M. Mary emphasized that a building must show a response to its needs and reflect the nature of the materials from which it was built. He wrote:

39. *Notice sur l'École centrale des arts et manufactures*, pp. 52–53.
40. *Bulletin de l'association amicale des anciens élèves de l'École centrale*, III (Paris, 1870), 69.
41. Mary, *Cours d'architecture*, p. 2.
42. *Ibid.*, p. 2.
43. *Ibid.*, p. 18.
44. *Ibid.*, p. 57.
45. *Ibid.*, p. 40.

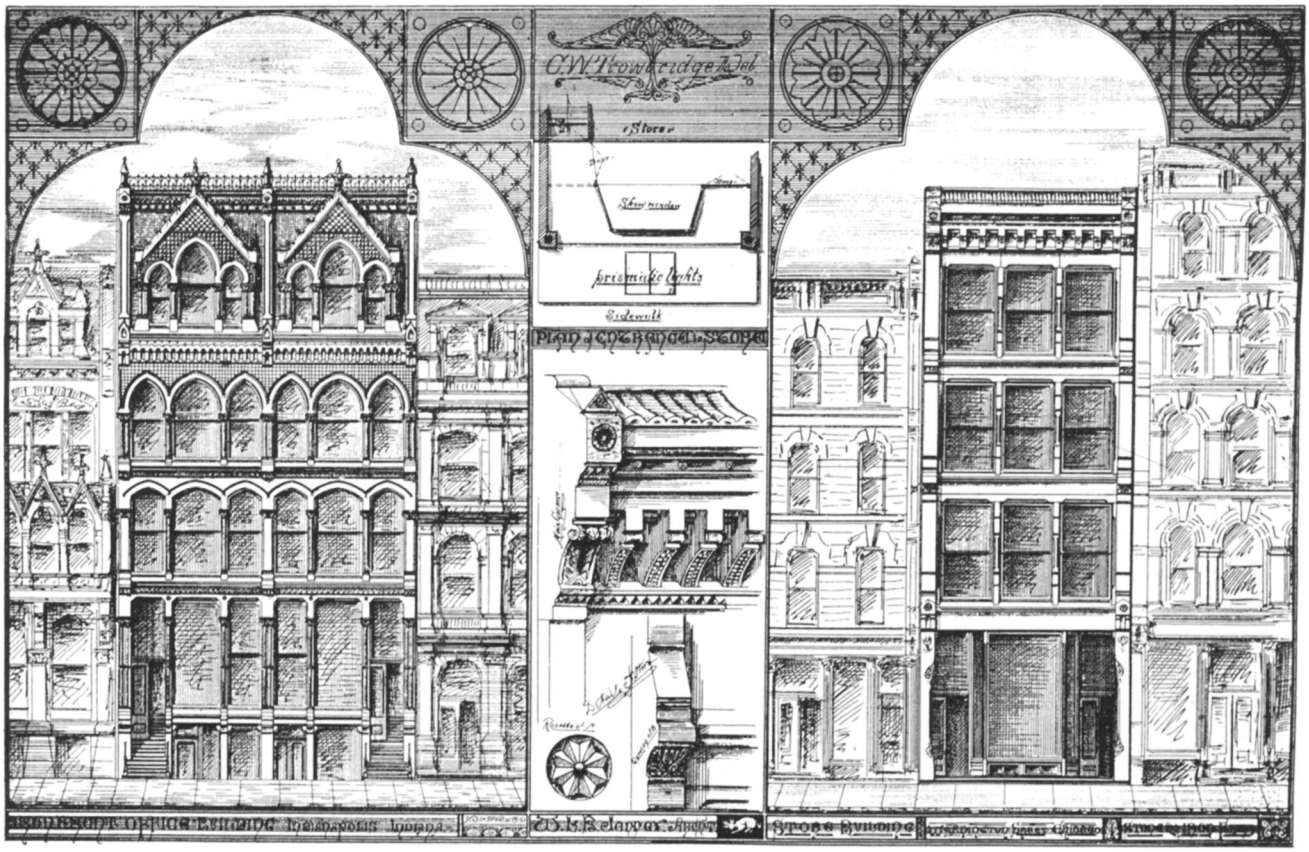

Fig. 1. Two store fronts by William Le Baron Jenney (from *American Architect and Building News*, 1, 1876).

> In a word, each type of edifice carries within itself the character which is proper to it and when one satisfies all necessities this character comes out naturally. One must abstain from all decorative work which is not necessary and does not naturally derive from the construction.[46]

M. Mary's ideas were not original. They derived directly from the early-nineteenth-century theorist J.-N.-L. Durand. Durand had been a professor of architecture at the *École polytechnique* during the Revolutionary and Napoleonic periods and as a close associate of engineers he embraced their principles. It was the engineers, he felt, who executed the most significant structures of the period.[47] M. Mary doubtlessly studied under Durand and it was from the latter's work that he derived his conceptions of function, planning, and economy.

The historical links are completed. The great contributions of the Chicago school of architecture can be seen directly and intimately related to the historical processes of the western world. Jenney, as the teacher of many of the important Chicago architects[48] assumes a more crucial rôle in the evolution of new forms. Louis Hautecoeur wrote that the ideas of Durand and his followers were ignored for most of the nineteenth century but were ultimately to triumph.[49] It is curious that they first took strongest root in the prairies of Illinois.

Jenney began to practice architecture in 1869. His earliest work was done in the Gothic Revival style. It was in the late 70s that he began to sense its inadequacies and seek new forms. The change can be seen in two buildings he published in *The American Architect and Building News* in 1876 (Fig. 1).[50] The building on the left done in Indianapolis was an iron fronted Gothic Revival type. The second, in Chicago, was planned in stone and iron. Its glass surface was open to the light and almost devoid of ornament. It was

46. *Ibid.*, pp. 59–60.
47. Hautecoeur, *Histoire de l'architecture classique en France*, p. 249.
48. Louis Sullivan, William Holabird, Martin Roche, and Daniel Burnham among others. Condit, *The Chicago School of Architecture*, pp. 34–35.
49. Hautecoeur, p. 279.
50. *American Architect and Building News*, 1 (1876).

this attitude which Jenney was to exploit in his subsequent commercial architecture.

The technical solution of the tall commercial building was achieved in the Home Insurance Building, but two other works, the first and second Leiter Buildings (1879 and 1889) represent the clearest expression of his aesthetic.[51] The first Leiter was an almost direct translation of M. Mary's methods into iron, glass, and brick (Fig. 2). The two sides facing on Wells and Monroe streets were treated as grids. This was especially true of the lower five stories (two stories were added in 1888). The only points of emphasis are the bearing surfaces. The rest is glass held by light metal mullions. Ornament was used but in a very restrained way. There is a simple cornice with slight classical overtones. Stone plates, each with a circle in it, emphasize the intersections of the major horizontals and verticals. Similar observations may be made regarding the second Leiter Building (Fig. 3). The plates are missing but the frame was more masterfully handled. An even less obtrusive cornice is supported by the simplest of capitals surmounting the stone sheathing of the metal columns. The points of support, with two horizontals, were brought forward. The rest of the surface recedes so that the structural rôles of the individual members is immediately evident. The result is a virile and dramatic design.

Both buildings are a complete visualization of the *papier quadrillé* method of design advocated by M. Mary and Durand. Their desire for economy, simplicity, and structural awareness is equally evident. The hint of the classical also derives from the teachings of the two Frenchmen. They felt

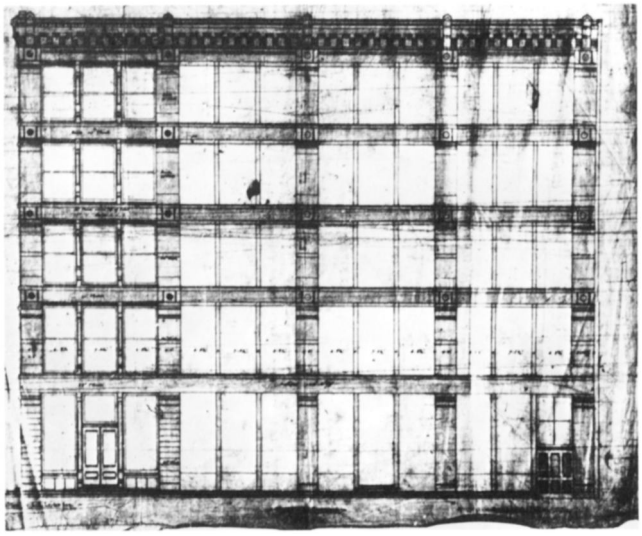

Fig. 2. The First Leiter Building, Chicago (courtesy of the Burnham Library, Chicago).

Fig. 3. The Second Leiter Building (Chicago Architectural Photographing Co.).

that the motifs adopted by an architect could reflect the traditions of a culture so long as they did not obscure the structure and function of a building or cause undue expense. In the case of Europe the classical tradition was the most appropriate.[52]

These attitudes were corroborated by Jenney's writings as well as his buildings. Ornament (or "art" as he called it) should be used as a complement to structure. He wrote:

51. For technical details see Frank A. Randall, *History of the Development of Building Construction in Chicago* (Urbana, 1949), pp. 88–89, 124. The second Leiter Building is now Sears, Roebuck and Co. The reason for the great variation in the quality of Jenney's elevations may have been the result of the draftsmen he employed. Martin Roche was his chief draftsman during the building of the first Leiter Building and may have been responsible for the clarity of the design of that structure. Something of the same may have been true of the second Leiter. Even in such a confused composition as the Home Insurance Building, however, the same revelation of the frame and the decoration of only the main structural members is evident. Jenney's principles varied only in their application. Mundie, *Skeleton Construction, Its Origin and Development Applied to Architecture*, Pt. II, p. 24.

52. Mary, *Cours d'architecture*, p. 19.

. . . Art in architecture must be used sparingly, like all other precious things. . . . We must admit, however, that . . . some architects . . . instead of using art to accent . . . construction, have spread it all over the surface, hiding the construction. . . . Ornamentation must be used with great moderation and must be in every instance appropriate . . . it is a good rule, whenever you cannot design an ornament that is . . . satisfactory . . . leave it plain. A plain surface is never offensive.[53]

The comment of Elmer C. Jensen (one of Jenney's later partners) quoted by Professor Condit must therefore be expanded. Mr. Jensen wrote of Jenney:

. . . His main purpose was the development of more efficient structural features. My personal opinion is that while he was fully conscious that his ideas and buildings were developing new forms, his main purpose was to create structural features which increased the effective floor areas and made it possible to secure more daylight within the buildings. . . .[54]

A strictly utilitarian interpretation of this quotation is in one sense correct. But as has been shown the utilitarianism cannot be seen alone. Utility was the basis of a broad theory of aesthetics which felt that beauty would come about naturally once practical needs were rationally satisfied.

William Le Baron Jenney was therefore more than a vernacular builder intuitively working from an American folk tradition. He continued a certain American dependence upon French artistic thought which can be traced to Thomas Jefferson. He consciously worked from a body of architectural doctrine that suggested the solutions he evolved. Jenney's best buildings are, in fact, a tribute to the enduring power of the French classical tradition.

53. Jenney, "A Few Practical Hints," p. 8.

54. Condit, *The Chicago School of Architecture*, p. 85.