

1980

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Recommended Citation

Betts, Raymond F. (1980) "Structuring the Ephemeral: The Cultural Significance of World's Fair Architecture," *The Kentucky Review*: Vol. 2 : No. 1 , Article 4.

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Structuring the Ephemeral: The Cultural Significance of World's Fair Architecture

Raymond F. Betts

For a period of slightly more than one hundred years international expositions created their own majesty as "phantom kingdoms": grandly planned, hastily constructed, greatly admired, quickly forgotten. These "world's fairs" were the emblems of an era confident that its technological achievements would assure greater human progress and international harmony. The ceremonial opening of the Great Exhibition of London was depicted in the *Illustrated London News* of 3 May 1851 "as the commencement of a new era of peace and good-will." On the occasion of the Parisian Exposition of 1900 the urban planner, Patrick Geddes, described this and all such expositions as "these millionfold witnesses to the essential and organic unity, the true internationalism, of civilization and progress."¹ As late as 1939, when Hitler's foreboding presence in Europe overshadowed any such assumptions, the official guide to the New York World's Fair of that year spoke of the Trylon, a seven-hundred-foot tower forming part of the central attraction, as the "symbol of the Fair's lofty purpose" which was "to show the way toward the improvement of all of the factors contributing to human welfare." More recently and on a more personal level, R. Buckminster Fuller viewed the Montreal Exposition of 1967 from his own creation, a transparent geodesic dome serving as the United States pavilion, and remarked: "We are all going into world man."²

The architecture was more varied and frequently less ennobling than the rhetoric used to describe the expositions, but the most memorable and commented on structures provided dimensions commensurate with the exposition's general purposes. In form or engineering technique they suggested human mastery of physical environment and, by extension, the creation of a reasonable and ordered universe. Because the international exposition was basically the occasion for the display of competitive national products, fair

buildings were generally designed to be both monumental showrooms and statements of national ideology.³ Yet the temporary nature of the exposition combined with the unusual purpose of such buildings (only the church and the museum previously had had such "display" purposes) to generate an architectural initiative that was often bold, whimsical, or garish in its design. Harvey Wiley Corbett, one of the leading architects of the Chicago World's Fair of 1933, remarked that "an exposition, being temporary in nature, theatrical in character and viewed by millions of people in the holiday spirit, gives the designer his own chance of presenting a new and rational interpretation of the building problem."⁴

What Corbett did not consider in this statement, although he respected it in his plans, was the unusual spatial problem that the international exposition presented. Maximum unobstructed floor space was required, to accommodate both large crowds and heavy equipment, such as railway locomotives or agricultural machinery. Moreover, the exposition was a "world's fair," an effort of sorts to provide within the confines of two or three thousand square acres of land a sense of the scale and diversity of human endeavor.

Not only were major fair buildings usually of imposing dimensions but also they frequently expressed an architectural allegory of the unity of modern civilization and, therefore, of the earth's inhabitants. The elliptical building of the Paris Exposition of 1867 was originally intended to be circular, suggestive of the shape of the world (Fig. 1). The slight change in geometric form did not,



Fig. 1 Elliptical Building—Paris Exposition of 1867

however, discourage the author of the official guide from speaking in elegiac terms: "To make the circuit of this palace, circular like the equator, is literally to go around the world. As in the beginning of things on the globe of water, the divine spirit now floats on this globe of iron." A similar elliptical design was suggested for a never-constructed world's fair planned for New York in 1883, while a more famous piece of imaginative, but unconstructed, architecture was proposed for the World's Columbian Exposition of 1893. This was Leroy S. Buffington's steel tent, a sort of astrodome before its time, but over-roofed with a conical railroad that would bring visitors upward to an imposing globe of the world situated at the top.⁵ What eventually approached Buffington's surmounted sphere in actualized form was the Perisphere of the New York World's Fair of 1939, the accompanying piece to the Trylon (Fig. 2). Inside that structure, proudly described as being as broad as a city block "and twice the size of Radio City Music Hall . . ." was a vast model of "Democracy," the well-articulated motor-city of the future. Yet of all such spherical structures, none had more impact or was more technologically daring than Buckminster Fuller's geodesic "skybreak bubble," twenty stories high and 250 feet in diameter, a building that dominated "Expo '67" (Fig. 3). If only an incomplete sphere, the dome was in accord with Fuller's notion of "spaceship earth" and, more particularly, of the physical principles upon which he assumed the earth operated.

The symbolism of the globe was obvious even to the casual fair goer, and in fact globes dotted the exposition landscape from the Parisian Exposition of 1889 down to the New York World's Fair of 1964-65. The "Terrestrial Globe," created for the 1889 exposition, was forty-two feet in diameter, detailed in its representation of the earth's natural and man-made features, and arranged to allow visitors to walk around and over it (Fig. 4). "This general view . . . gives the measure of the immense work accomplished during this century," announced a reporter for the French publication, *La Nature*.⁶ The "Unisphere," serving as the motif of the 1964-65 fair, was an abstraction of a world now most familiar to fair visitors. It was constructed of stainless steel "with the land masses supported on an open grid of latitudes and longitudes," the official fair magazine explained.

Such structures and architectural forms preoccupied exposition designers much less than the challenge of the outsized and the immense—the opportunity to build on a scale that was heretofore



Fig. 2 The Trylon and Perisphere—New York World's Fair of 1939

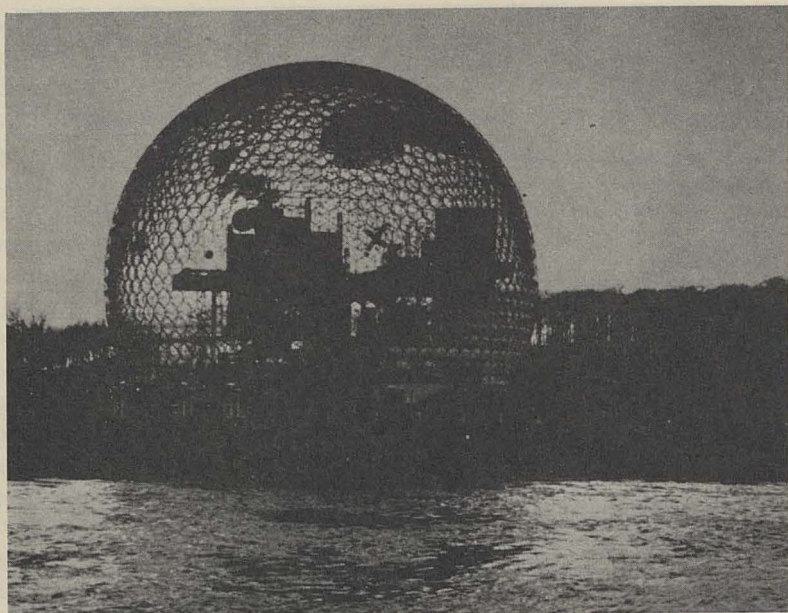


Fig. 3 Buckminster Fuller's Geodesic Dome—Expo '67

Photo by Olga Gueft reprinted with permission from *Interiors* magazine, copyright 1967, Billboard Publications, Inc.

impossible because of inadequate technology. Thanks to the rapid progress made in iron and steel production, both the horizontal and the vertical lines of human vision were dramatically extended on the fair grounds. The immense shed and the lofty tower became the awesome monuments of the international exposition.

Reduced to simple historical terms, all exposition architecture of nearly a century was a response to the monumentalism of the Crystal Palace (Fig. 5). That incredible building, a vastly extended greenhouse, revolutionized building design in general and set the standards for the shape of subsequent world's fairs. Beyond the striking visual effects it produced, principally through the lavish use of glass, the Crystal Palace provided a freedom of interior space never before considered possible. This change can most easily be understood in the mathematical explanation provided by one writer.⁷ A gothic cathedral concedes $1/6$ of its interior space to its support system of stone. In bold contrast, the Crystal Palace only yielded $1/2200$ of its area to that purpose.

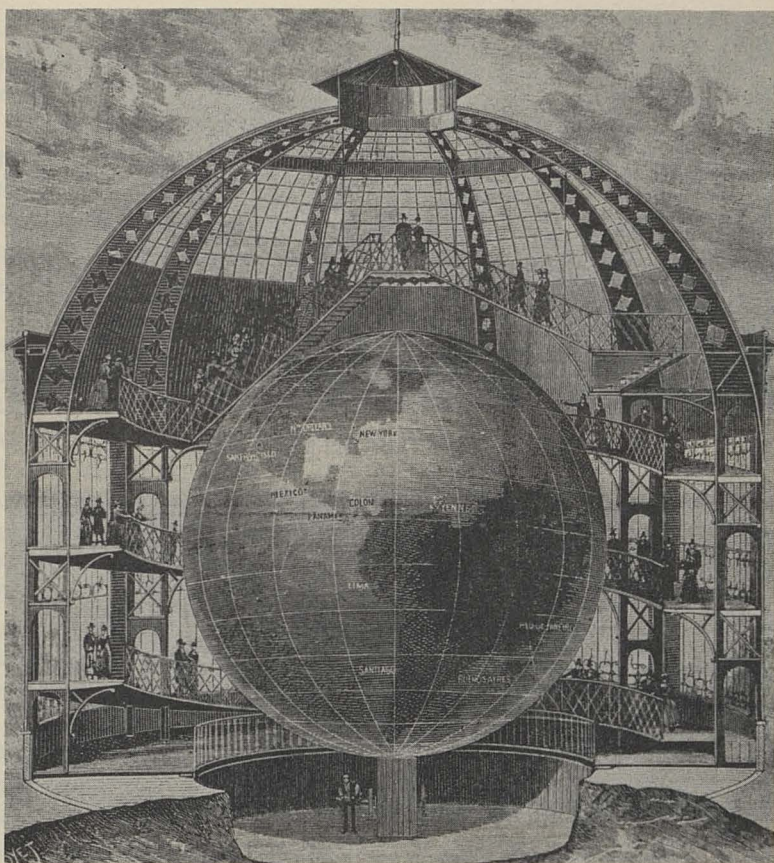


Fig. 4 Terrestrial Globe—Paris Exposition of 1889

Certainly not all fair buildings were experiments with this early form of glass wall construction, but the architectural desire to emulate the grandeur of the Crystal Palace was frequently intense. The sense of political power which the Baroque style had earlier lent the Versailles of Louis XIV was now matched by the sense of technological power which the exhibition hall imposed on the fair goer. Man was no longer the measure of all things; industrial products were. And they commanded vast expanses of space. The Crystal Palace was designed to be 1,851 feet long, in keeping with the year in which it was constructed. The principal exhibition hall of the Viennese exhibition of 1873 was 3,000 feet long. The

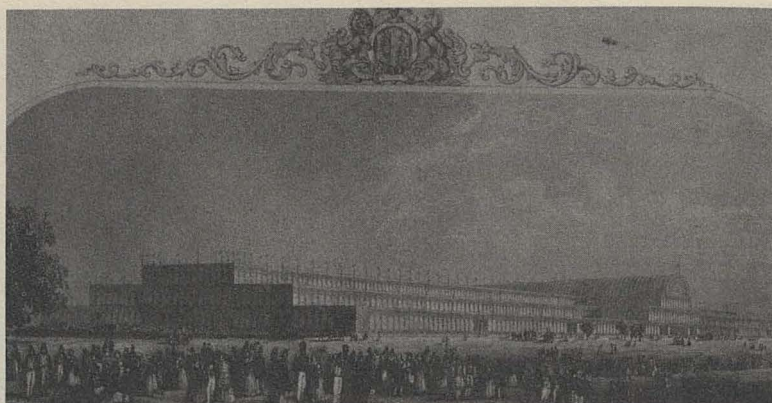


Fig. 5 The Crystal Palace—The Great Exhibition of 1851

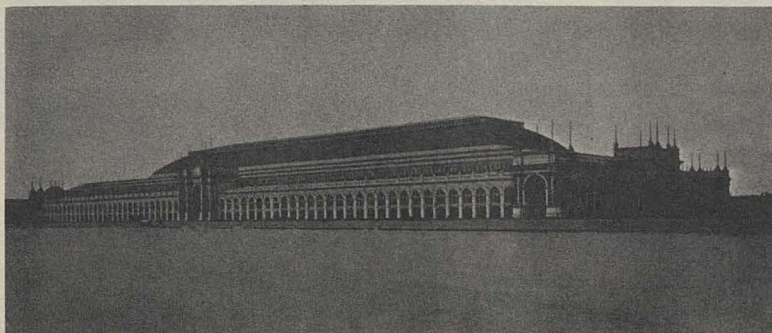


Fig. 6 Manufactures and Liberal Arts Building—World's Columbian Exposition of 1893

architects of the Chicago World's Fair of 1893 initially toyed with the idea of a 1,000-foot-long building, without windows and hence provided with total environmental control through artificial lighting and air-conditioning.

A major departure from these examples of "shed" building at international expositions was the pavilion of the Federal Republic of Germany erected at the Montreal "Expo '67." This immense tent, which rambled over two acres and was pointed at striking angles because of its variously placed masts, provided some 864 million cubic feet of space. If Buffington's unrealized steel tent for the 1893 world's fair is not considered, the German tent would certainly figure as the most unusual and impressive example of the most

obvious form of temporary architecture or, as explained in an architectural journal, "one of the largest and most daring tensile structures ever erected by a non-spider."⁸

Equally challenging to the designer charged with the task of enclosing large amounts of open space for exhibition purposes was the predominantly nineteenth century engineering problem of increasing the span of the width of a building without the obstruction of supporting beams for the roof. The Crystal Palace set the first measure of such clear spans, with 72 feet of unobstructed space. However, this was quickly surpassed by the main building of the Parisian Exposition of 1856 which attained a span of 156 feet. The Parisian exhibition of 1889 and the World's Columbian Exposition of 1893 both boasted buildings which vaulted over 350 feet of open space (Fig. 6). The exact span of these largest of fair buildings yet constructed became a matter of dispute, with French and American authors contending that their respective national endeavor was the greater. Because both buildings—the Machine Hall of 1889 and the Manufactures and Liberal Arts Building of 1893—were dismantled and because conflicting figures appeared in different sets of plans and official documents, the honor of the "greater" was most belatedly conferred on Chicago by calculations reported in 1970.⁹

The booster statement in the official catalogue that the Manufactures and Liberal Arts Building was of such vast proportions that "it was theoretically possible to mobilize the standing army of Russia under its roof" gives some idea of the effect such large structures had on the nineteenth century mentality. Perhaps the most interesting philosophical explanation for this popular fascination with the spatially grand was that offered by Henry Adams in *Mont-Saint-Michel and Chartres*. Mankind's desire, he proposed, had long been "to grasp the infinite." Formerly cathedrals and now world's fairs stood as efforts to that end. "The world's fair," he continued, "tends more and more vigorously to express the thought of infinite energy."¹⁰

A man of his times, Adams was one of the many who recognized the newly proportioned world that the industrial revolution had created. The railroad train, the telegraph, even the hydrogen-filled dirigible were among the new determinants of the measure of space, as indeed was the Crystal Palace. Furthermore, the expansiveness of the age was matched by the restlessness of its populations, which forced the outward movement of cultural as

well as of spatial frontiers. It was therefore fit that Frederick Jackson Turner presented his now classic "frontier thesis" at the meeting of the American Historical Association which was held during the World's Columbian Exposition of 1893. In retrospect, it may seem somewhat amusing that Turner spoke of the closing of the American land frontier as he stood in the shadow of the largest expanse of enclosed space that mankind had yet created. However, his comments on the psychological significance of open space effectively, if unintentionally, complemented many of the comments already made about the vastness of the interior space arranged at the international expositions. Describing the impressions he received as he stood in the Crystal Palace, the German author Lothar Bucher remarked that "the side walls are too far apart to be embraced in a single glance. Instead of moving from the wall at one end to the wall at the other, the eye sweeps along an unending perspective which fades into the horizon."¹¹ Former President Benjamin Harrison, visiting the Manufactures and Liberal Arts Building in the same year that Turner offered his thesis, commented on the "indefinite sense of vastness which one gets as he ascends toward the high roof of the building. . . ." ¹²

The closing physical frontier and the grandly opened space of the exhibition building were, most obviously, activities occurring on a horizontal plane that had always been the major axis of human development. However, verticality acquired dramatic appeal as a line of architectural development in nineteenth century exposition planning. "Deeply anchored in mythopoeic thinking," according to the architectural philosopher, Sigfried Giedion,¹³ verticality had been emphasized in steles, obelisks, and columns some two millennia before the Montgolfier brothers proved to mankind that vertical movement to seemingly incredible heights was a possibility. This first balloon ascent by humans in 1782 may not have excited the architectural imagination, but subsequent engineering techniques made possible through the precise manufacture of iron and steel parts, and through the invention of Elisha Otis's elevator with a safety device against falling (first displayed at the New York Fair of 1853) suggested that the sky could be pierced or "scraped" by a tall structure.

The notion of a one-thousand-foot high tower recurred in writing and sketches many times over before Gustave Eiffel unfurled the French flag atop his engineered triumph in 1889. No monument of exposition architecture has since been considered



Fig. 7 The Eiffel Tower—Paris Exposition of 1889

more innovative, none has been more criticized, and none has yet been more enduring. The tower was the main gate to the Parisian Exposition of 1889; it has subsequently become the universally recognized symbol of the city of Paris (Fig. 7). Had a similar, but much less elegant, structure been erected as proposed for the American Centennial Exposition of 1876, Eiffel would now be remembered much less well, as an able bridge designer.



Fig. 8 Platform of the Eiffel Tower—Paris Exposition of 1889

The Eiffel Tower, as many literary and architectural critics have pointed out, is less a building than a framework.¹⁴ It does not enclose space but participates in it (Fig. 8). Somewhat more poetically, the building joins the horizontal line of earthly reality to the ill-defined region of hope and dream called the sky. To Eiffel the tower was an engineering problem and a technological triumph; to the visitors who walked underneath its vast arches, it was the subject of awe. In the more ponderous vocabulary of the student of architectural psychology, the structure was an example of "teleological space," marking the center of some vast and exciting arrangement of human activity still hidden from the line of sight of the visitor approaching the fair.

The Eiffel Tower, like the Crystal Palace before it, added a continually appealing dimension to exposition architecture. What the one had done on the horizontal plane by embracing space, the other did on the vertical by piercing it. Buffington's proposed steel tent for the 1893 exposition was the first response to Eiffel's achievement. Forty years later, on the occasion of the next

Chicago-based fair, Frank Lloyd Wright dramatically proposed a skyscraper that would have risen a half mile above the lakefront site of the fair. However, Wright had been excluded from the list of official architects, supposedly because of his uncooperative spirit, and few individuals even bothered to take his plan seriously. Yet, in keeping with the theme of "A Century of Progress," the fair officials allowed the construction of a gargantuan "Skyride," supported by two steel towers, each 628 feet high and both standing 1,850 feet apart (Fig. 9). The 700-foot high Tylon of the 1939 New York World's Fair and the 600-foot high "Space Needle" of the 1962 Seattle Exposition carried on the tradition of a vertical motif, if on a less elevated level than the Eiffel Tower.

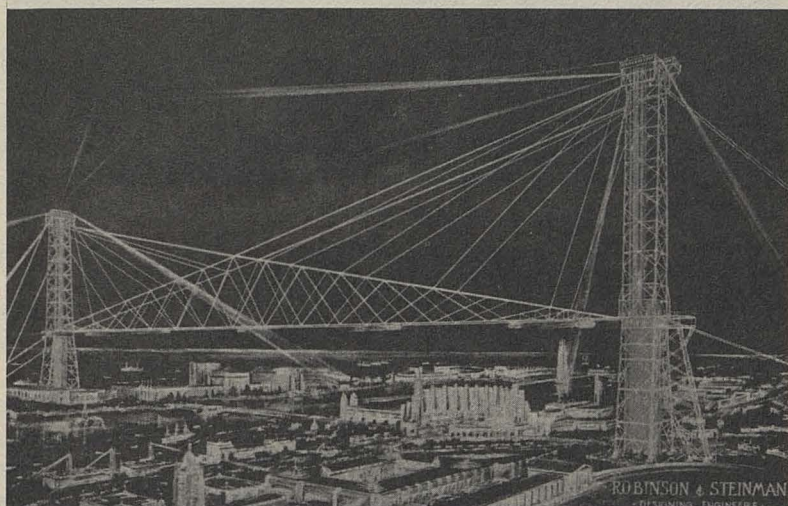


Fig. 9 The Skyride—Chicago World's Fair of 1933

It might be contended that the Parisian Exposition of 1889 was the grand moment of monumental exposition architecture. The gloriously high Eiffel Tower and the cavernous Machine Hall were technological triumphs and therefore statements of the refined material progress achieved by Western civilization. The French President Sadi Carnot, visiting the exposition, pronounced that "it was a display of ideas rather than of things."¹⁵ In the sense that the rational, scientific mind seemed to have mastered matter, Carnot's statement had the momentary ring of truth. It was, moreover, a

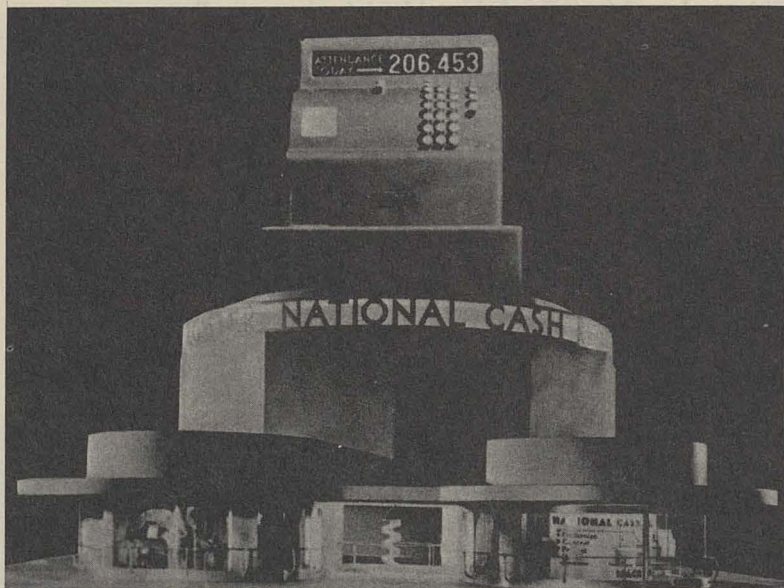


Fig. 10 National Cash Register Building—New York World's Fair of 1939

less philosophical equivalent of the explanation of the Eiffel Tower offered by Eugène-Melchior de Vogüé, novelist and literary critic: "this modern pyramid was elevated by a command of the spirit, by the force of calculation requiring a small number of workers. All the strength required for its edification seems to have been drawn from thought which acts directly on matter."¹⁶

No such praise of architecture was directed to the Chicago fair of 1933 or the New York fair of 1939. One of the most severe critics saw the former as a gaudy show in the mood of jazz, which he condemned; while an architectural historian dismissed the latter as "this heterogeneity of week-end escapism."¹⁷ Most twentieth century fairs moved more to the commercial, extended the carnival spirit beyond the midway, grew now more whimsical, now more garish, in their architecture. (The giant cash register which served as the exhibition building of the National Cash Register Company at the 1939 New York World's Fair is taken as a "classic" example of such development) (Fig. 10). By the interwar period the purpose of such international expositions had attenuated. New means of communication had allowed a vaster public the opportunity of seeing the wonders of the age without the need of a visit to the

industrial display at a fair. The technological possibilities that had been presented in an occasional fair building—again the Crystal Palace comes to mind—were now commonplace realities of every major world city. And, obviously, the noble epigram, peace through progress, had been lost in the rubble of World War I.

Against this modern historical background, the architectural success of the Montreal Exposition of 1967 may seem startling. This, the grandest of all fairs, rivaled the Parisian Exposition of 1889 with its innovative and dazzling buildings. In truth, the visual appeal of the Montreal fair was due in large measure to its break with the recent architectural past. The packaging of modern buildings in steel and glass boxes, the unrelieved, urban horizontality and verticality which appeared to mock the earlier achievements of the world's fairs and their architects, were boldly decried by the planners and designers of "Expo '67." Along with Fuller's geodesic dome—popularly referred to as "Bucky's Bubble"—the German plastic-and-steel tent and the Netherlands pavilion, a vast lace-like framework of aluminum tubing from which were hung the walls of the exhibition hall, won considerable acclaim. Here were structures that eminently suited a fair because of the unencumbered space they provided. One magazine called this the "Space Frame Fair,"¹⁸ a reference to these and other major structures which had eminently solved the old exposition problem of enclosing vast space cheaply and efficiently—and temporarily.

To suggest a sort of dramatic symmetry, the historian of exposition architecture might assert that Montreal concluded what London had begun. The Crystal Palace had demonstrated the possibilities of industrial construction and the use of glass—with the largest panes yet produced employed for that purpose. In a similar innovative way, the Parisian Exposition of 1889 demonstrated the vast structural possibilities of iron and proved, according to one enthusiastic critic, that industrial architecture had "aesthetic value."¹⁹ The 1933 Chicago "Century of Progress" fair was technically notable for its use of neon lighting as an architectural component and for gypsum board, newly introduced as a safe, inexpensive, and quite manageable exposition building material. Montreal recognized the age of aluminum tubing, of plastic, of tensile structures. The Fuller dome and the German tent were triumphant expressions of the imaginative and flexible forms that architecture might follow in the future.

Even though a paradox of the vulgar and the inspired—as one



Fig. 11 The Trusses of the Machinery Building—World's Columbian Exposition of 1893

writer described the New York World's Fair²⁰—international expositions will be remembered historically not for their local color but for the grandeur and dignity they proposed as the conditions of modern humanity. The memorable buildings therefore must be viewed retrospectively as brief statements to technological progress, to the peaceful, but impressive, domination of nature.

In the earthy language of Walter Lippmann, writing in 1939, the world's fair proves "that the human race is a collection of the most marvelous, ingenious and engaging idiots that ever got possession of a noble planet."²¹ No doubt similar thoughts, however couched in sterner prose, ran through the minds of the first visitors to enter the Crystal Palace and the first passengers to ride the elevators ascending the Eiffel Tower.

Concrete expressions of the faith that nineteenth and early twentieth century planners had in technological progress, the international expositions were intended to be showcases for all that was good and wonderful (and the second adjective had much meaning) at the time. "It's a flash photograph of civilization on the run," aptly remarked Joseph P. Hawley in an article on the Parisian Exposition.²²

Certainly, there were those critics who viewed the exposition as an "expensive toy" or only a "vanity fair,"²³ but the architecture and the site were examples of the first efforts at modern total planning, in which new engineering techniques and building materials allowed for occasional, but always startling, experimentation (Fig. 11). The drama of the world's fair was in the hasty resolution of large problems of organization and in the subsequent abandonment of most of what had been grandly constructed. Most fairs opened in disarray and closed in desolation. Between, there stood a symbolic representation of the world, settled by nations generally crowded together on a few thousand acres of land.

Exposition architecture, however unimpressive it generally may have been, served well the peculiar need of constructing the monumental temporarily.

NOTES

¹"The Closing Exhibition—Paris 1900," *Contemporary Review*, Nov. 1900, p. 668.

²Quoted in Robert Fulford, *This Was Expo* (Toronto: McClelland and Stewart, 1968), p. 54.

³The aura of nationalism which surrounded international exhibitions can be sensed in the following two statements. The first is commentary on the Great Exhibition of 1851: "It may be stated that no nation and capital are [sic] in a condition to undertake such design except England and London. The vast amount of value here entrusted to our safe keeping is the highest acknowledgement ever paid to the genius of national order and stability" (Martinius Scriblerus, "Exhibition Notes. No. 1," *Illustrated London News*, 14 June 1851, p. 590). The second statement is about the Parisian Exposition of 1900: "These Paris exhibitions resolve themselves into so many demonstrations on the part of the least tottering of the Latin nations, a continuous protest against the waxing of rival stock" (F. G. Aflalo, "The Promise of International Exhibitions," *The Fortnightly*, May 1900, p. 837).

⁴Quoted in Forrest Crissey, "Why the Century of Progress?" *Saturday Evening Post*, 10 June 1933, p. 63.

⁵On the many unrealized, but impressively designed, exposition buildings in American architecture, see Alison Sky and Michele Stone, *Unbuilt America: The Forgotten Architecture in the United States, from Thomas Jefferson to the Space Age* (New York: McGraw-Hill, 1976).

⁶Reprinted as "The Terrestrial Globe at the Paris Exposition," *Scientific American Supplement*, 10 Aug. 1889, p. 11347. A larger globe had been

built on the occasion of the Great Exhibition of 1851. 60 feet in diameter, this globe was erected in Leicester Square, London, and was not actually part of the fair.

⁷Kenneth John Conant, "The Artist in Wartime," *Journal of the American Society of Architectural Historians*, 3, No. 4 (1943), 5-6.

⁸"Frei Otto Designs 864 Million Cubic Feet," *Architectural Forum*, 126, No. 3 (1967), 59.

⁹Donald Hoffmann, "Clear Span Rivalry: The World's Fairs of 1889-1893," *Journal of the American Society of Architectural Historians*, 29, No. 1 (197), 48-50.

¹⁰*Mont-Saint-Michel and Chartres* (Boston: Houghton Mifflin, 1933), p. 104.

¹¹Quoted in Sigfried Giedion, *Space, Time and Architecture*, 5th ed. Cambridge, Mass: Harvard, 1967), pp. 253-54.

¹²Quoted in David Burg, *Chicago's White City of 1893* (Lexington, Kentucky: University Press of Kentucky, 1976), p. 113.

¹³*The Eternal Present* (New York: Pantheon, 1964), I,440.

¹⁴The author's interpretation has been greatly influenced by Roland Barthes, *La Tour Eiffel* (Geneva: Delpire, 1964).

¹⁵Quoted in M. G. Van Rennselaer, "Impressions of the International Exhibition of 1889," *Century Magazine*, Dec. 1890, p. 316. The particular term may have been borrowed from the thought of the director-general of the Paris Exhibition. He used it in an article he later wrote on the fair. See Georges Berger, "Suggestions for the Next World's Fair," *Century Magazine*, April 1890, p. 845.

¹⁶"A travers l'exposition," *Revue des deux mondes*, July 1889, pp. 194-95.

¹⁷Douglas Haskell, "Architecture: 1893, Looking Forward at Chicago," *The Nation*, 24 Jan. 1934, p. 110; and Paul F. Norton, "World's Fairs in the 1930s," *Journal of the American Society of Architectural Historians*, 24, No. 1 (1965), 29.

¹⁸See J. Acland, "Expo: The Space Frame Fair," *Arts Canada*, April 1967, pp. 4-8. Also cited in Fulford, p. 39.

¹⁹Vogüé, "A travers l'exposition," *Revue des deux mondes*, 15 July 1889, p. 442.

²⁰Sidney M. Shalett, "Epitaph for the World's Fair," *Harpers*, Dec. 1940, p. 23.

²¹"A Day at the World's Fair," *Current History*, July 1939, p. 50.

²²"The Value of International Exhibitions," *North American Review*, Aug. 1889, p. 317.

²³"The Proposed Exhibition of 1851," *Blackwood's Magazine*, Sept. 1850, p. 279; and "The Arrangement of Great Exhibitions," *The Nation*, 23 Nov. 1875, p. 337.