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Architecture for Community and Spectacle: The Roofed Arena in North America, 1853-1968

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Abstract

This dissertation provides the first treatment of the origins and development of the roofed arena in the United States and Canada. Supported by archival resources of graphics and text, and informed by direct contact with arena architects, design and operations staff, this study examines the arena as a place for spectacle within the larger environments of city and campus. The arena's site, massing, and design revealed the expectations of its sponsorship. The arena's internal configuration of roofed seating bowl, floor, portals, and passages was a purposeful arrangement intended to accommodate attendees and manage their movement through architectural space.

The first chapter focuses on the transmission to the nineteenth century, via the architecture of theater, circus, and other spaces of public assembly, of the Greek and Roman hippodrome oval for accommodation of multiple kinds of revenue-generating activities situated within a circular, elliptical, or rectilinear seating bowl. The significance of the Royal Albert Hall, London, as the conceptual model for the presentation of modern indoor spectacle is recognized. But within the context of the growth or urban centers and the expansion of commercial leisure, Stanford White's Madison Square Garden, New York, is documented as the principal formal model. White's facility, a hippodrome within a rectangular industrial shed, whose impact was amplified by the communications media that disseminated its image and the reports of its spectacle, generated successors on a continental scale.

The research method identified buildings, sought to find relevant information, and fixed the buildings along a time line. Populated with enough examples, the time sequence yields affinities and clarifies differences, making possible useful generalizations about site and design in context. Across the time period considered, enclosure evolved from arched and pitched forms, and thin-shell experiments, toward the anti-industrial dome and drum. The emergence of tensile solutions allowed roof support to act as a design element as well as engineering. But by the end of the 1960s, circular and ovoid buildings receded in favor of the operationally more efficient rectilinear footprint covered by a flat truss or space frame. Exteriors of brick and stone became complex fields of concrete, glass, and multiple forms of metal. Over the long term, internal treatment of attendee space emphasized presentation of finished surface.

This dissertation identifies those formal architectural attributes that carried the arena's programmatic objectives. It examines the emergence of the commercial, mercantile arena; higher education's recognition of the capacity of the architectural fabric of arenas to support institutional growth; and municipalities' use of the form to project government-defined civic values. The chronological narrative recognizes the intensity of concurrent strands of development between the World Wars and concludes by noting arena managements' increasing interest in building commercial destinations for attendees outside the seating bowl. Finally, the work establishes the role of the arena in large-scale repurposing of urban land in the 1960s.

The Appendix is an extensive census of the large roofed arenas built in North America between 1853 and 1968. It provides the name of the facility, dates of design and opening, architect, type of siting, and configuration of building envelope. The Appendix introduces distinctions useful for analysis. Component siting, in contrast to independent siting, indicates placement of the arena within a system of buildings of associated purpose. Centroidal positioning indicates a building's occupation at the functional center of mass. Building envelope--with pitched or arched roof or other kind of enclosure--operates with siting as another indicator of sponsors' Intent.

By assembling and reading the evidence of site, design, and operation, this paper ventures an approach to

understanding the place of the roofed arena in the North American urban landscape. It is hoped that this work will invite and assist investigation into related issues, e.g., the architectural profession's approach to arena projects and, particularly, the commercial archaeology and human geography of the arena's interior zones.

Keywords

architecture, community, roofed arena, North America

Disciplines

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Comments

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THE ROOFED ARENA IN NORTH AMERICA, 1853-1968

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William Bradford Keller

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hockey rink and for Roche Dinkeloo's New Haven Coliseum. I am also grateful to Dahlen Ritchey, who discussed with me his Civic Arena for Pittsburgh, and Elliott Hoffman, who contributed perspective on arenas from the standpoint of the entertainer's legal team. Larry Brown, former coach of the Philadelphia 76ers professional basketball team, spoke with me about the seating bowl's impact on player performance.

This project required me to assemble an array of disparate resources. I sought and received the cooperation of librarians and archivists in public and private institutions, municipal architects, architecture firms, college athletic directors and the facility managers, building superintendents, administrative officers, and communications directors of arena venues throughout the United States and Canada. I want to emphasize the assistance of J. Michael Chaykowsky, Manager of Building Operations, Madison Square Garden, New York; Lawrence Harrington and John Page, Comcast-Spectacor, Philadelphia; David Miller, HOK Sport; and Paul Simpson, Operations Supervisor, Mellon Arena, Pittsburgh. I thank the curators of collections with particular importance for this work: Martin Aurand, Architecture Archives, Carnegie-Mellon University; Dawn Eurich, Detroit Public Library; Bruce Laverty, Athenaeum of Philadelphia; Marjorie McNinch, Hagley Museum and Library; Janet Parks, Avery Architectural and Fine Arts Library, Columbia University; and William Whitaker, Architectural Archives of the University of Pennsylvania. For their interest and help I acknowledge also Maureen Beck, Robin Bledsoe, Nancy Bloomgarden, Alan Braddock, Caroline Brandenberger, John Brandenberger, Caitlin Bronner, Gregory Bronner, William Bronner, Jack Perry Brown, Jean-Marie Clarke, Julia Converse, David Corbin, Lee Corbin, Richard Flint,

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about the sport, its teams, personalities and, to a limited extent, its architecture. The establishment in 1994 of hockey as a national sport of Canada encouraged the government to include its study in the funding program of the Social Sciences and Humanities Research Council of Canada (SSHRC), a federal agency that promotes and supports university-based research and teaching. With the support of that government entity, it is likely that substantive work on North American arena architecture will emerge.[7]

There has been systematic work to enumerate sites and buildings related to the development of sports in the United States, and a National Historic Landmarks Theme Study on Recreation was prepared in 1987. More than 9,000 of the nearly 79,000 National Historic Landmark listings are historic places of entertainment and leisure.[8] The Iowa State Historic Preservation Office completed in 2003 an architectural and historical survey of historic properties associated with the development of team sports in Iowa from 1850 to 1960.[9] Histories of theater buildings also sometimes include entries for arenas.[10] The present account draws from the study of buildings erected in the United States and Canada. Closer examination of selected examples was carried out in order to present the principal trends of site and design from the period of the arena's gestation in the third quarter of the nineteenth century to the end of the main period of postwar urban renewal around 1968. In order to build a body of source material adequate to support a thorough and coherent treatment of the building type, and to reflect its commercial, civic, and institutional relationships, I relied on a broad range of unpublished and published resources. Drawings and plans, maintenance records, and archives generated by owners,

PREFACE

This account of the architecture of the North American roofed arena examines it both as a place for spectacle and as a significant, if contingent, factor in the development of cities, from the arena's emergence in the latter half of the nineteenth century to the end of the 1960s. It emphasizes those elements of site and form that vested the arena with value and at the same time looks at the relationship between municipalities and their communities of prospective users, site owners, arena developers, arena managements, and event attendees. Site, massing, and decorative program were indices of that value. Over time, value was subject to decay, as the circumstances of site changed and the architectural fabric lost impact.

The roofed arena in North America, defined here as the United States and Canada, accommodated activities on a floor and spectators in permanent seats configured in a bowl or in ranks. Spectators, having walked through passages from the entrance to the seating, faced a central surface, a lengthwise parallelogram with squared or rounded corners. Ancient Greece and Rome supplied the models for the principal elements of floor and seating, with the Latin term *harena* describing the absorbent sand in the central part of the gladiators' amphitheater that became the floor of the modern version. The

modern arena, sometimes including a proscenium stage at one end, developed in the nineteenth century as an enclosed mass. Built by a sponsor and operated by a management for spectators' enjoyment of competition, performance, or display, the roofed arena derived from the placement of the ancient seating bowl and portal entrance system within the pitched or arched roof programs developed for mill, factory, exposition, and transportation. The iron and steel truss, made up of short members configured in triangular patterns, spanned large distances without requiring floor supports that would have impeded floor circulation. Metal framing, encased within masonry, carried the roof's burden to the ground. Over time, technologies of design and building materials changed, as did the programmatic significance of the arena's component parts. The roofed arena hosted transitory events but was in most cases intended to be a permanent structure.[1] To attain economic sustainability, an arena may have had to accommodate several kinds of activities in order to attract sufficiently large aggregate numbers of attendees. Depending upon the event presented, attendees voiced their opinions and encouragement or, in the case of post-Wagnerian theatrical presentation, watched and listened in darkness and silence.

Subject to era, situation, and the ability to command the attention of its communities of interest during planning and use, the arena exercised formal influence beyond the perimeter of its site. This study is concerned with what is revealed by the data provided by the site and the formulary and discretionary elements of the built fabric: the exterior closure formed by foundation; engineered superstructure and walls; the finishes and partitions of its internal envelope, concourses and conveyances; and the texts and

images carried by signage. Arena form could be boldly presented and used to encourage associated development or configured as one element of a larger complex. In other situations, the arena's profile was concealed within a generalized commercial exterior or positioned inside an urban block, accessed by a passageway marked by a marquee. At times, architects used stylistic elements to reduce the blunt effect of volume.

The roofed arena both limited and provided view. The arena removed events from the public sphere in order to gain by allowing public access in exchange for value received. Arena spaces offered spectators settings for watching events and making behavioral choices, such as moving about, purchasing, cheering, and observing other observers. The ritual of attending an arena event joined the spectator with the interior, as the ancients transitioned to the sheltered *Mishkan*. The change began with the travel to the arena. As one approached the site, individuality gave way to identification with the crowd. One passed through designed entrance control and began walking through concourses toward a final portal. Beyond that portal was a spectacular environment of arena floor, seating, and roof. The architectural spaces negotiated by the spectator on the way to his seat (street to entrance portal, portal to lobby or concourse, concourse to seat) represented a physical analogue of transitional process as posited by Arnold Van Gennep *in The Rites of Passage* (1909). Van Gennep considered the crossing of life's thresholds as transforming acts, resulting in unification with new states of being: "To cross the threshold is to unite oneself with a new world."[2] The roofed arena was a new world: illuminated arena floor below (earth), dark roof above (sky). As spectators moved through the arena concourse, an area of display as well as of conveyance, self-restraint

receded and the world changed. The crowd's passage to the center promised a new and exciting environment removed from normal time. Yet that setting held contradictions. Arena management addressed the spectator as an individual, as well, and in a framework independent of the structured time controlling the witnessed event. In the midst of the event, advertisements beckoned.[3] Arena management used the concourse, as well as advertisement in the arena and throughout, together with printed programs, to try to transform the crowd into a malleable collection of individual purchasers.[4] Management encouraged attendee enthusiasm to the extent that it could be controlled by means of personnel and restraint based on form and configuration of paths and barriers.

Once past a controlled entrance, attendees moved about and purchased goods associated with the activity or contest being presented. The limits of their movement and the range of their purchasing options generally were determined by the facility managers. The configuration of the seating bowl influenced the crowd's arousal by determining the distance and sight lines between spectator and event. The seated individual held a vantage point over the arena floor. At the same time, by virtue of that privileged position, the individual was targetable by commercial messages intended to extract value.

The architecture of the North American roofed arena has received little research attention. At the end of the twentieth century, and continuing into the twenty-first, urban practitioners and journalists began to comment and write about the arena's role in facilitating downtown development. Most of the attention was directed toward contemporary projects. As a building type, the roofed arena has been recognized for its contribution to the life of a community by individuals commenting in reminiscences.[5]

The many emotive articles about the character and demise of older venues are generally unsatisfying. Probing the affective ties between people and place, using the arena as locus, could be the task of a different study. The components of aura resist definition. A venue's longevity or identification with a winning team (such as the Montreal Canadians and the Montreal Forum) may aid in its production, or at least encourage management to market its perception. Sound, of the crowd and of the play (such as the boom of a hockey stick when it is banged against the boards), has a role. Until recently, the form has not attracted the interest of historians in any significant way. There is no architectural history of the roofed arena in North America, although there are books about some buildings, including Madison Square Garden, Maple Leaf Gardens, and the St. Louis Arena. These publications focus on the sports played and entertainment presented. Claims of primacy in design and configuration are asserted without explanation, The event accommodation business has shown little interest in sponsoring anything but brief summaries of decades of development.

Ice hockey, one of the important sports of the arena's early years, has drawn new interest. The sport began as an outdoor, team-based recreation, but, as an indoor paid attraction, it offered arena owners multiple event dates during each month of the season. Beginning in the 1970s and intensifying in the mid 1990s, Canadian hockey fans as well as the government of Canada fostered discussion of the sport's origins and recognized hockey as a central element of the country's cultural identity.[6] This account makes use of published and unpublished resources generated by the Canadian national interest. The Toronto-based Society for International Hockey Research has developed information

operators, associates, urban planners, and others were consulted where appropriate and available. Architects and design staff granted a number of interviews. Arena managers in the United States and Canada provided their perspectives. Relevant information was extracted from programs and printed ephemera; the published literature of the arena and auditorium management business; and the architecture, engineering and building trades. Local newspaper accounts contemporary with an arena's construction, opening, or closing were consulted. Internet library reference service was heavily used. Textual and graphic information gleaned from websites (mounted by cities and towns, colleges, universities, sports teams, manufacturers, and individuals) supports the work.

Chapter 1 focuses on the transmission to the nineteenth century of the Mediterranean oval for activity situated within a seating bowl. In addition to an investigation of the survival of some of the actual ancient fabric, Renaissance period publications of commentary on Rome are also utilized. Here, too, I also look at the demand for theatrical space and the revival of oval and bowl and their encasement within the enclosing framework of industrial form. Chapter 2 discusses the growth of the continent's urban centers, leisure time, and the development of the internal configuration of the spectators' environment as first realized in McKim, Mead & White's Madison Square Garden of 1889-91. Exploration of the possibilities of new building materials, the development of private sponsorship of arenas, and managements' recognition of the potential of attendees to generate revenue beyond the cost of admission are treated in Chapter 3. Chapter 4 examines the arena on the college and university campus between the World Wars, a period of developing appreciation by higher education administrations

of the facility's institutional and public roles. The urban parcel-clearing civic groups of the 1920s and 1930s, discussed in Chapter 5, incorporated arena elements in order to project to the community government-defined civic values. Chapter 6 focuses on arena-based urban renewal in Pittsburgh and elsewhere and on management's orientation toward revenue production and arena siting on the urban periphery. On campus, the arena was used to advance institutional objectives. Chapter 7 discusses autonomy and componency of arena development and offers concluding remarks. A census of buildings with seating capacity of 10,000 or greater and constructed between 1853 and 1968, with name, architect, dates of construction, site context, and characteristic of massing, is found in the Appendix.

NOTES FOR PREFACE

[1] A notable exception was Sam Houston Hall, built in Houston by Jesse H. Jones and the Democratic National Committee for the 1928 presidential nomination of Al Smith. This arched roof structure existed solely for the event and was later dismantled. See image and description in University of Texas, Center for American History, Digital Media Repository, "Sam Houston Hall," http://www.cah.utexas.edu/db/dmr (accessed January 9, 2007).

[2] Arnold van Gennep, *The Rites of Passage,* trans. Monika B. Vizedom and Gabrielle L. Caffee (1909; repr., Chicago: University of Chicago Press, 1960), 20, 24.

[3] For an attempt to read the features of a professional hockey arena, see Michael Robidoux, *Men at Play: A Working Understanding of Professional Hockey* (Montreal: McGill-Queen's University Press, 2001), 55.

[4] See John Bale, *Sport, Space and the City* (London: Routledge, 1993), 73. For discussion of the individual and the crowd, see Elias Canetti, *Crowds and Power* (New York: Viking, 1963), 27-28; George C. Izenour, *Theater Design*, 2nd ed. (New Haven, CT: Yale University Press, 1996), 5; Albert Mehrabian, *Public Places and Private Spaces* (New York: Basic Books, 1976), 283.

[5] Bruce Kuklick explored place and memory in the baseball park in *To Everything a Season: Shibe Park and Urban Philadelphia, 1909-1976* (Princeton, NJ: Princeton University Press, 1991). See also Yi-fu Tuan, *Topophilia: A Study of Environmental Perception, Attitudes, and Values* (New York: Columbia University Press, 1990). A twentieth-century city planner recalled: "The Philadelphia Arena was very important for the city. I used to skate there." Edmund Bacon, interview with author, July 8, 1998.

[6] See Philip Moore, "Practical Nostalgia and the Critique of Commodification: On the 'Death of Hockey' and the National Hockey League," *Australian Journal of Anthropology* 13, no. 3 (2002): 309-22.

[7] The SSHRC funded a multi-year grant to Howard Shubert to write a history of ice skating rinks and hockey arenas in North America. That history has not yet been

published, though Shubert has presented on the topic: "Hockey Night in America: The Role of Architecture in the Expansion of Professional Hockey to the United States" (29th conference of the North American Society for Sport History, London, ON, May 25-28, 2001). See also his "Evolution of the Hockey Arena: Building Better Hockey Barns 1860 to 2000," in *Total Hockey: The Official Encyclopedia of the National Hockey League*, 2nd ed. (Kingston, NY: Total Sports, 2000), 553-61); and *Canadian Encyclopedia,* s.v. "Sports Facilities," (http://thecanadianencyclopedia.com/ (accessed May 17, 2006).

[8] Shannon Bell, presentation "America at Play: Documenting Recreation and Leisure with the National Register of Historic Places," Preserve and Play: Preserving Historic Recreation and Entertainment Sites, Chicago, IL, May 5-7, 2005.

[9] Ralph J. Christian, presentation "Finding, Evaluating and Listing 'Em: The Iowa Experience with Team Sports Sites" Preserve and Play: Preserving Historic Recreation and Entertainment Sites, Chicago, IL, May 5-7, 2005. See also Donald E. Hamilton, *Hoosier Temples: A Pictorial History of Indiana's High School Basketball Gyms* (St. Louis: G. Bradley, 1993.

[10] See, e.g., Craig Morrison, *Theaters* (New York: W.W. Norton, 2006).

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6.58 Harrison & Abramowitz; Ammann & Whitney. Assembly Hall, University of Illinois, Champaign, IL, 1963. From *Arena, Auditorium, Stadium Guide* (1963), 22.

6.59 Wilson, Morris, Crain & Anderson; Lloyd, Morgan & Jones; Walter P. Moore & Associates. Astrodome, Houston, TX, 1965, elevated view. Postcard, ca. 1985.

6.60 Curtis & Davis; W. Norman Nolan and Nolan; Edward B. Silverstein & Associates; Sverdrup & Parcel. Louisiana Superdome, New Orleans, LA, 1975, elevated view. Postcard, ca. 1990.

6.61 Charles Luckman Associates. Madison Square Garden Center, New York, NY, 1968, under construction. Pennsylvania Railroad Company records, image 88231cs106. Courtesy of Hagley Museum and Library, Wilmington, DE.

6.62 Charles Luckman Associates. Madison Square Garden Center, New York, NY, 1968, model, with project principals and Mayor Robert F. Wagner. Pennsylvania Railroad Company records, image 882311965. Courtesy of Hagley Museum and Library, Wilmington, DE.

6.63 Charles Luckman Associates. Madison Square Garden Center, New York, NY, 1968, section. Pennsylvania Railroad Company records, accession 1810. Courtesy of Hagley Museum and Library, Wilmington, DE.

6.64 Charles Luckman Associates. Madison Square Garden Center, New York, NY, 1968, site plan. Pennsylvania Railroad Company records, accession 1807. Courtesy of Hagley Museum and Library, Wilmington, DE.

6.65 Madison Square Garden, New York, NY, 1968, property footprint. From *Sanborn Manhattan Land Book*, 1994-95, pl. 59.

ABSTRACT

This dissertation provides the first treatment of the origins and development of the roofed arena in the United States and Canada. Supported by archival resources of graphics and text, and informed by direct contact with arena architects, design and operations staff, this study examines the arena as a place for spectacle within the larger environments of city and campus. The arena's site, massing, and design revealed the expectations of its sponsorship. The arena's internal configuration of roofed seating bowl, floor, portals, and passages was a purposeful arrangement intended to accommodate attendees and manage their movement through architectural space.

The first chapter focuses on the transmission to the nineteenth century, via the architecture of theater, circus, and other spaces of public assembly, of the Greek and Roman hippodrome oval for accommodation of multiple kinds of revenue-generating activities situated within a circular, elliptical, or rectilinear seating bowl. The significance of the Royal Albert Hall, London, as the conceptual model for the presentation of modern indoor spectacle is recognized. But within the context of the growth or urban centers and the expansion of commercial leisure, Stanford White's Madison Square Garden, New York, is documented as the principal formal model. White's facility, a hippodrome within

a rectangular industrial shed, whose impact was amplified by the communications media that disseminated its image and the reports of its spectacle, generated successors on a continental scale.

The research method identified buildings, sought to find relevant information, and fixed the buildings along a time line. Populated with enough examples, the time sequence yields affinities and clarifies differences, making possible useful generalizations about site and design in context. Across the time period considered, enclosure evolved from arched and pitched forms, and thin-shell experiments, toward the anti-industrial dome and drum. The emergence of tensile solutions allowed roof support to act as a design element as well as engineering. But by the end of the 1960s, circular and ovoid buildings receded in favor of the operationally more efficient rectilinear footprint covered by a flat truss or space frame. Exteriors of brick and stone became complex fields of concrete, glass, and multiple forms of metal. Over the long term, internal treatment of attendee space emphasized presentation of finished surface.

This dissertation identifies those formal architectural attributes that carried the arena's programmatic objectives. It examines the emergence of the commercial, mercantile arena; higher education's recognition of the capacity of the architectural fabric of arenas to support institutional growth; and municipalities' use of the form to project government-defined civic values. The chronological narrative recognizes the intensity of concurrent strands of development between the World Wars and concludes by noting arena managements' increasing interest in building commercial destinations for attendees

outside the seating bowl. Finally, the work establishes the role of the arena in large-scale repurposing of urban land in the 1960s.

The Appendix is an extensive census of the large roofed arenas built in North America between 1853 and 1968. It provides the name of the facility, dates of design and opening, architect, type of siting, and configuration of building envelope. The Appendix introduces distinctions useful for analysis. Component siting, in contrast to independent siting, indicates placement of the arena within a system of buildings of associated purpose. Centroidal positioning indicates a building's occupation at the functional center of mass. Building envelope—with pitched or arched roof or other kind of enclosure—operates with siting as another indicator of sponsors' intent.

By assembling and reading the evidence of site, design, and operation, this paper ventures an approach to understanding the place of the roofed arena in the North American urban landscape. It is hoped that this work will invite and assist investigation into related issues, e. g., the architectural profession's approach to arena projects and, particularly, the commercial archaeology and human geography of the arena's interior zones.

Chapter 1

FROM THE COLOSSEUM TO MADISON SQUARE GARDEN: BUILDING THE FOUNDATION OF THE NORTH AMERICAN ARENA

An arena is an enclosure formed by a seating bowl, a central field of play or display, portals and passages, and a roof. The constituent elements of the arena produced in their combination a spatial, visual, and sonic environment. Within this designed envelope people observed events, the building, and one another. The focal area, the arena floor, changed its shape based on the activities it accommodated. Seating and passages derived from Greek and Roman forms, with the ancient forms conveyed across time by the survival of physical remains, their revival in publication, and their employment in the development of rooms of public assembly and the modern theater. The multi-purpose roofed arena emerged in the late nineteenth century because public and private interests recognized the economic potential of selling access to controlled space for watching acts of competition or display. Driven by industrial needs, technological advances in structure, lighting, and heating enabled the creation of long-spanned, roofed volumes, capable of accommodating multiple ranks of seating directed toward illuminated, relatively

comfortable interior space. The arena was a volume filled by performers and observers based on internal organization and functional accommodation. It occupied a site and contributed its shape and surfaces to the external built environment. This dissertation probes the impact of these affecting elements in order to clarify understanding of this building type, a principal gathering place for urban and regional populations in twentieth-century North America.

Greek and Roman Precedent

We recognize the arena's essential configuration of seating and field of play as a legacy of the classical world, as A. Bartlett Giamatti indicated:

> Our fan has entered an arena or stadium which may look more like its ancient precursor than anything else in the modern world looks like its architectural ancestors. The gods are brought back when the people gather.[1]

The generally accepted date for the beginning of games in southern Greece at Olympia is the eighth century BC. The competitions initially took place on a plain selected for proximity to existing higher ground (and therefore, seating) in the environs of the altars of Zeus and Hera. In the fourth century BC a stadium was constructed outside the sanctuary some distance to the east. In Athens, the original stadium fabric consisted of stone foundation of temporary wooden seating, provided by Lycurgus in 331 BC. Herodes Atticus installed marble seating in the second century AD.[2]

The Greek stadium's U-shape accommodated seating requirements and was generally oriented to footrace activity undertaken on the playing surface. Vertical aisles divided the bowl into sections. Spectators and honored attendees (situated in backed seats at the bottom row of the closed end where the footraces finished) viewed men as they raced along the straight and around curves. The stadium at Delphi, begun in the fifth century BC and installed with stone seating during the second century AD, was cut into a hillside above the sanctuary of Apollo and seated about 7,000 people. An inscribed stone, which is extant, regulated spectators' possession of wine.[3] The Rhodes stadium, built in the third century BC, measured 600 feet, the approximate length of many Greek examples. In the classical Greek period, venues for footrace and horserace were distinct. The Greek hippodrome was formed by connecting two semicircles with parallel lines. Olympia's racecourse, built in 600 BC near the stadium but washed away, accommodated horses racing around the straights and curves of a full oval. At Delos, an important religious sanctuary, stadium and hippodrome accommodated the Delian Games in the fourth century BC.

The Greek oval served as a formal model for Roman appropriation and dissemination. With the associated shapes of apse, hemicycle, and exedra, the oval appeared during successive periods of revival of classical forms for the purpose of enclosing activity and assembly space. The durable oval persisted to become the prototypical floor configuration for North American circus grounds and for the roofed arena itself.[4]

Other Greek building types, conceived on a smaller scale and often roofed, served comparable purposes, although spectatorship was not always specifically accommodated. The Palestra, a rectilinear form, primarily served athletes, though their coaches and seconds would have observed from the side. The Odeion was a roofed space intended for public speaking and for theater. Four ranks of seating amid columns faced a central area from four sides. The Ecclesiasterion at Priene of 200 BC offered seating on three sides and a central performance space similar to a modern thrust stage.[5] The Greek theater, whose orchestra was converted to arena floor in Roman cities, incorporated elements (e.g., proscenium, orchestra, tiered seating of the *cavea*) later modified or redefined for the roofed arena.[6]

The *spectacula* or amphitheater of the Roman Republic and Empire housed the arena of gladiatorial battles and animal hunts and fights between animals.[7] The arena initially referred to the central ground of contest or display, but later to the enclosing building itself. The monumental amphitheaters distributed around the Mediterranean basin marked the desire of communities to emulate Rome and improve their standing among civic rivals. These state-funded facilities provided entertainment for attendees who viewed drama on the arena floor and observed audience behavior in other seating areas. During the time of Augustus (27 BC-14 AD) and after, social hierarchies were reflected in ticketing and seating practice.[8] Sponsors of games in amphitheaters honored the dead according to custom but provided funds mainly in order to gain prestige. Political leaders presented spectacles to acquire and maintain popular support.

During the Roman Republic, gladiatorial games were held in the Roman Forum inside a temporary wooden structure situated between two basilicas. Spectators sitting in the basilicas and in other permanent buildings within the Forum viewed the arena floor. Vitruvius, writing in 20 BC about accommodating spectacle in public places, understood the Forum's oblong shape and colonnades as convenient for the presentation of spectacle.[9] The Forum's open space was trapezoidal. The shape of the wooden structure within it is not known, though arguments have been made for both modified oval and ellipse.[10] On the basis of a colonial community's desire to emulate Rome, the unusual stone oval at Iol Caesarea (Cherchel) in North Africa of 25 BC-23 AD (fig. 1.1) may be a reflection of the wooden structure in the Forum.[11] The Caesarea oval was a convex closed planar curve (like any oval) but with straight, parallel sides and opposing curved ends. This was the shape of the twentieth-century circus, both tented and arena. Many mid-twentieth century arenas, such as the Colisee, Quebec (1949), and the Los Angeles Sports Arena (1959), were oval in configuration. Others have defined the Forum's seating structure as a principal source of the elliptical amphitheater as it developed in the second and first centuries BC.

The amphitheater, built upon the ground as standing structure in order to accommodate spectacle, emerged in Campania during the second or first century B.C. The Pompeii amphitheater of 70-65 BC is an example.[12] The seating bowl was a built form, in contrast to the partially earth-supported bowls of the Greek stadium and hippodrome. In effect, the mountain's curves and angles were brought together and placed within walls, though not always fully enclosed and not roofed. The amphitheater,

a site for spectacle, was outside the forum environment but retained a civic identification and function. As a purpose-built permanent facility, the amphitheater invited transient appropriation by event sponsors desiring to increase prestige by sponsoring spectacles in honor of the departed. Political candidates built amphitheaters to increase their chances of winning appointment to civic positions.[13] An early amphitheater of stone and wood, perhaps located to the south of the Campus Martius in Rome, was established in 29 BC by Statilius Taurus.[14] Its destruction in 64 AD invited the Emperor Vespasian (ruled 69-79 AD) to consider the siting of its replacement as a way to increase his own standing as well as the Flavian line of succession.

The Flavian Amphitheater or Colosseum of Rome of 69-98 AD (fig. 1.2), with a capacity of 50,000 persons, projected authority throughout the Roman Empire and, in word and image, across succeeding centuries. Built of concrete, brick, mortar, and stone, the Colosseum, by the focus of its purpose and the magnitude of its scale, became the West's conceptual--though not always formal--model for spectacular accommodation. Begun by Vespasian and completed by his sons Titus (ruled 79-81 AD) and Domitian (ruled 81-96 AD), the Colosseum reclaimed for the community of Rome the site of Nero's Domus Aurea.[15] Travertine blocks and boundary stones marked its precinct. Stones or bollards broke up masses of approaching crowds. The elliptical arena provided a major axis, along which were positioned simultaneous activities of multiple groups of humans and animals (a precursor of the three-ringed circus of the late nineteenth century), together with scenographic elements used in mythological recreations.

The Colosseum's stone exterior presented three stories of arches flanked by engaged columns with a surmounting plain wall divided by pilasters into alternating compartments pierced by windows. Corbels fastened above the windows provided support for the masts suspending the *velarium* or sail of dyed linen which covered much of the amphitheater to protect spectators from sun and rain (fig. 1.3).[16] There is scant evidence of the use of awnings in ancient circuses, though Julius Caesar used the *velarium* in the Forum's comparably lengthy space in 46 BC.[17] Lucretius described its space-creating effect at that time: In the Forum, the great colored cloth received the sun's rays and created a kind of internal environment by appearing to dye the stage and audience.[18] A similar effect might have been created in the Colosseum.

Within that structure, vaulted pathways of brick and masonry (some with carved plaster surface) sorted and directed spectators to *vomitoria* (portals), leading to five interior seating tiers divided by concentric walkways. Podia and decorated balustrades marked the lower zones. Epigraphy revealed that some seating sections were assigned to affinity groups, such as school teachers.[19] Seating support progressed from marble and limestone at the bottom to wood above. Each horizontal zone also was divided vertically into *cunei*, wedge-shaped sections. The Colosseum's integrated design included purposeful direction of spectator movement and seating. Segregation of attendees required an extensive system of banks, ramps, and stairs. Ticketing practice required spectators to enter specific passages through one of eighty portals, seventy-seven of which were numbered. A spectator's seat, step (i.e., row), internal portal, and *cunei* all were verified at the entrance arch. The passages were routes to seating sections, not

entrances to large concourses from which seating sections were accessible. The absence of broad paths of internal mass movement indicated that facility or event sponsors would not attempt to command the attention of a cross section of attendees except by the action taking place on the arena floor. During and following the time of Augustus, social hierarchies were reflected in ticketing and seating practice. Dignitaries used four wide and unnumbered entrances. The arched passage functioned as a way of transfer, leading the spectator into the internal environment, where the darkness of the passageway was pierced by the beckoning light admitted by the internal portal. Each spectator's field of vision included not only the arena floor but, as in Arles (late first century AD, the enclosing curvature of the seating as well (fig. 1.4). Inside, according to commentary by Tacitus, restraints on public behavior were relaxed. Life's course toward death was, for unlucky gladiators, beasts, and condemned criminals, accelerated – not only in the Colosseum, but in amphitheaters throughout the Roman sphere from Verona, Pozzuoli, and Nîmes to Spain, North Africa, and the Greek East.

By means of paired curves and straights, the hippodrome oval directed and redirected movement of observed contestants along parallel courses. Rome's principal oval spectacular enclosure, the Circus Maximus, was an active venue for eight centuries beginning around the third century BC. For periods of its existence between fires and reconstructions the exterior rose three stories in a marble-faced, arched and engaged-column arrangement apparently similar to the Colosseum.[20] The Circus Maximus was used for gladiatorial battles and games, but its configuration and fabric identifies it as a hippodrome, a place prepared for equestrian-based racing. Unlike the voyeuristic gaze

projected by attendees of events likely to be held in amphitheaters, which were based on bloody encounter between forces of unequal strength (e.g., lions vs. condemned criminals), racing fans projected their own identification with teams of contestants. Many race participants were likely to survive an event and appear in the next, leading to the establishment of recognized rivalries. In contrast, the principals of the Colosseum's gladiatorial battles changed. Continuity in competition among charioteers drew the audience, whose loyalty was fostered by the hippodrome management's providing information as the races progressed and applying rules intended to support equal chance. For example, the *carceris*, the chariot stalls at the west end, were arranged along a curve to provide a uniform distance to the finish. The hippodrome track was divided lengthwise by the *euripus*, a barrier formed by a series of pools of water along a low wall, erected by the censors, acting as the venue's management.[21] The barrier, which had a slight jog to ensure equitable starting positions, supported the building's scoreboard and principal decorative element and supported lap-counting devices in the form of eggs or dolphins.

The oval, a double U, was an appropriate configuration for races, providing a kind of template for continuous regeneration of movement across the space.[22] It suggested enclosure of repetitive movement. Curved seating provided a theatricality of view and reflected the approach and gradual change in direction of the competing *quadrigae*. The competition between teams (Reds, Whites, Blues, Greens), the expectations of rabid fans, and the political impact of the participation and performance

of the ruler's (and his subjects') favorites required management and contestants to follow a consistent game process on a familiar configuration of arena floor.

The oval affected movement and viewer experience in non-athletic spaces, as well as in the competitive arenas. In the rectangular arrangement of the Severan basilica at Lepcis Magna (ca. 200 AD) opposing apsed ends offered focal points and redirection of foot traffic back to the longitudinal axis. Within the basilica and the hippodrome, the oval established reciprocity of view. The ovals invited viewers inside the basilical space to direct the gaze to the paired ends. And from behind the apses' columns, viewers observed the central space. The hippodrome offered many spectators views across the oval's half to the other side's spectators. Later revivals of classical forms incorporated the ovoid's theatricality, contributing to the formation of nineteenth-century expectations for the roofed arena.

The oval hippodrome was used for more than a single function. It could, e.g., accommodate chariot races and animal hunts; amphitheaters could not. A high degree of versatility was achieved by placing the hippodrome floor within the amphitheatrical volume. At Castrense, in the city of Rome, elliptical amphitheater and oval hippodrome were adjacent, as they would be in the New Jersey Meadowlands complex seventeen centuries later.[23] At Caesarea (Israel), Jerash, and elsewhere, the hippodromes were shortened in the second and third centuries AD to produce smaller ovals, increasing the programmatic flexibility of the spaces. At Herod's hippodrome at Caesarea (22 BC), a colonnaded gallery was later added above the back wall of one side of the facility. Prior to that, attendees entered the stands from the arena floor and could not easily pass

through the seating areas. By allowing cross movement via the gallery, management accommodated spectators' desire to circulate and communicate before, during, and after the event. It was an early recognition that the events taking place on the arena floor did not constitute the entirety of the attendee experience.[24]

Recession and Revival of Type

After the end of gladiatorial games and exhibition of wild beasts in the sixth century AD, scale of event presentation changed. People, of course (wherever they lived) did not stop gathering in groups to view activities or events. For example, independent of arena development, the mounds and plazas of Cahokia (east of St. Louis, Missouri, ca. 1000 AD) established a site for observed performance. But within the Mediteranean tradition, amphitheatrical space attracted markets and fairs, small settlements and sites for Christian worship. Though the great forms were quarried, buried, or masked by accretions,[25] their memory persisted. Enrico Scrovegni, the fourteenth-century financier, argued that his planned Padua chapel--to be decorated with Giotto's frescoes--would act as a corrective against the barbaric use of the arena ground upon which it was built.[26] The initial setting of the medieval tournament's "festive wars" was open field with outdoor stands and galleries. The open or enclosed court, where handball and tennis were played, and the balconied assembly room emerged as palace-based game and display sites for a more private realm.[27]

Surviving monumental examples (principally the Colosseum), together with later revivals of amphitheatrical form in theaters, circuses, and other public spaces and in residences, conveyed the arena to the nineteenth century, when it acquired roofing. The Mausoleum Augusti of 28 BC became, successively, a family stronghold, fortress, amphitheater, bullring and, in the twentieth century, concert hall. Images (e.g., Hieronymus Cock's graphic dissemination of Maarten van Heemskerck's 1552 painting *Stierkämpfe in einer antiken Arena*, and Pirro Ligorio's 1561 engraved reconstruction of ancient Rome, *Effigies Antiquae Romae)* and professional publications (e.g., Augustin-Charles d'Aviler's *Dictionnaire d'architecture civile et hydraulique,* Paris, 1755, part of his *Cours d'architecture* of 1691 and later) kept the form in front of the public and the architectural profession. Publication transmitted models across time: Serlio's illustration of the Theater of Marcellus (17-13 BC) in his *Architettura* (1540) provided Wren with a form for the Sheldonian Theater in Oxford (1664-67), in turn an inspiration for Sanders Theater in Harvard's Memorial Hall (Ware and Van Brunt, 1866-78). Entries in dictionaries of architectural terms reflected the spread of amphitheatrical forms in contemporary building for theater, medical teaching, circus, and garden design.[28]

Manuscript material conveying the text of Vitruvius, an interpreter of Roman architecture and engineering of the first century BC, was discovered at St. Gall in 1414 and appeared in print in 1486. The author-architects of the Renaissance, beginning with Leon Battista Alberti in the middle of the fifteenth century, emphasized theater which, unlike amphitheater or hippodrome, had remained in use.[29] Filarete, writing in mid-century, referred to amphitheater and hippodrome as theaters and focused on their bowl

seating and vaulted passages.[30] Theatricality of space became an object of design. Begun in 1505, Bramante's Belvedere Court of the Vatican included an exedra in the upper court. The exedra was approached by a system of concentric steps, offering view of the lower court. Pirro Ligorio's ca. 1561-65 remodelling provided a space for performance and spectatorship.[31] Sixteenth-century theaters began to include elements derived from the spectacular architecture of the antique, creating configurations revived later in roofed arenas. Palladio's design for a basilical Egyptian hall, published in the second book of his *Quattro Libri* (1570), inspired the ballroom in Lord Burlington's Assembly Rooms in York of 1730, itself a model for later multi-purpose rooms associated with, but distinct from, roofed arenas.

At York, perimeter columns both screened and gave emphasis to central space. At Holkham, begun in 1734, the steps and columns of the apsed end of William Kent's entrance hall formed a small amphitheatrical environment.[32] Within rectangular space, a semicircular end (or semicircular ends situated in opposition) suggested enclosure of continuous, reoccurring movement. Seating along a curve was appropriate for viewing proscenium-based theater but foot races and horse races as well. In the theater, the curve distributed points of vantage before the proscenium plane.

In the hippodrome oval the curve reflected the approach and gradual change of direction. The curve gave spectators the perspective of movement of figures within a frame of limited dimensionality and fixed distance (theater) and of movement of figures within a series of vision fields of full dimensionality and changing distance (hippodrome). This versatility of the Greek and Roman seating curve allowed the form to

serve both applications in the modern era by having survived in the theater across earlier centuries.

The Teatro Olimpico in Vicenza of 1585, begun by Palladio but finished by his pupil Scamozzi, enclosed a seating bowl within a rectangle (fig. 1.5). Performance space thrusted far forward toward the bowl, invading in part the arc formed by the seating. Scamozzi's theater for Vespasiano Gonzaga at Sabbioneta (1588) continued the theme of pushing the ends of the seating oval toward the stage. This configuration created additional open space in the area in front of the proscenium and had the effect of directing the spectators' view to an enlarged field, including the performance area but also the rows of seating on the other side.[33]

The project to create arena floor within theater culminated in Giovanni Battista Aleotti's theater in Parma of 1618-28, built for Ranuccio II Farnese in the former armory of the ducal residence (fig. 1.6). Here the ends of the oval seating bowl extended to create an even larger central field. The Teatro Farnese directed spectator view not only to the oval field enclosed within the oval seating, but to the proscenium stage as well. Aleotti's theater was an early example of combined arena and stage, a configuration noted in roofed venues in succeeding centuries (e.g., the Baltimore Civic Center of 1962). In late eighteenth-century commentary the Teatro Farnese was referred to as the only modern theater in Italy.[34] The architect attempted to maximize the versatility of the dramatic space by providing multiple points of view and fields of activity. Narrow entrances heightened the effect of the great space inside, which was used for a variety of

events, including mock naval battles fought on a flooded arena floor. The seating bowl was surmounted by a visual suggestion of seating within niches framed by columns.[35]

Contemporary applications of antique assembly spaces abounded in the second half of the eighteenth century, encouraged by such publications as Carlo Fontana's *L'anfiteatro Flavio* (1725) and Isaac Ware's edition of Palladio (1738). The ancient hippodrome oval appeared frequently in projects and proposals as, for example, in Peyre's central structure extensions in a design for an academy building of ca. 1755[36;] James Wyatt's Great Room in the Pantheon, London, of 1769-72; Robert Adam's entrance hall at Syon of ca. 1761; and John Soane's Rome-inspired, apsidal, colonnaded court entrance for a senate house in London, unbuilt, of 1779. Classical forms were appropriated for pragmatic civic uses, as well. The Colosseum inspired the Paris corn exchange (Halle au Blé) of 1763-66, by Nicolas Le Camus de Mézières. Initially a vaulted court, the exchange was later covered successively by timber and cast iron domes. These spectator-suitable and theatrical curvilinear designs could be mined for rearrangement. The galleried ballroom could not offer such potential for either capacity or flexibility. For example, Fischer von Erlach's gallery niches at the Spanish Riding School in Vienna (1729-35) and Augustin Bétancourt and Ossip Bovet's equestrian exercise facility in Moscow (the Manege, 1817-25) distributed onlookers at viewing positions with foursquare relation to the central space.

An interior oval often was configured by placement of apsidal form at one or both ends of rectangular space. The rounded form ordered the space by establishing a principal focal area for viewers' attention. For example, Robert Adam's entrance hall at

Syon led to a planned central area but was itself a position where people stood and looked at the apsed end. The establishment of direction and bidirection of view was evident in theater design, as well. Within the space of a theater, the gallery opposite the stage (the apsed end's analogue, but subordinate to side boxes) provided sight into and past the proscenium while itself being an object of view. In the renovation of the Theatre Royal, Drury Lane, of 1775-76 (fig. 1.7), Adam's paneled upper gallery rail broke the line established by rails in front of the side seating. As pictured in his published *Works* (1779), Adam used a decorative motif specific to the upper rail. This rail's positioning may have been a function of the placement of seating; nevertheless, it drew attention to the gallery.[37] Differentiation of the rear of the house from the side seating elevations was a theatrical distinction. Stanford White, in McKim, Mead & White's Madison Square Garden in New York of 1889-91, placed a hippodrome oval within an industrial envelope and applied a theatrical treatment to the rear balcony level inspired by Adam.

Multiple definitions of "circus" developed in the eighteenth century, spurred by the publication of Roman topographical information such as Giambattista Nolli's 1748 plan of Rome, which included ancient and modern buildings, and of strong images of the hippodrome in Piranesi's *Antichita Romane* (1756). The Roman circus was large, with the remembrance of its imposing scale allowed for multiple meanings. The *Builder's Dictionary* (London, 1734) included the definition of "Roman venue for chariot racing," but in secondary position to the contemporaneous use for "exhibiting Shews to people." John Wood I, writing in 1742, proposed to make a place for the exhibition of sports in Bath, to be called the Grand Circus.[38] His Circus (1754-58) in Bath and the elliptical

Royal Crescent (1767-75) of John Wood II asserted a contemporary interest in composing urban space by juxtaposing geometrical shapes in the planning of housing, as well as a sensitivity to curvilinear forms inspired by Rome and Palladio. As interpreted by George Dance II in 1791 for the Earl of Camden, a Colosseum could be one of the shapes available for designing urban projects.[39] Goethe, writing in 1786, wondered why the ancient amphitheater in Verona could not be used for the sporting contests of his day. In his view, the seating crater created order out of confusion and formed the spectators into a noble body.[40] By the end of the eighteenth century, amphitheater, theater, and circus generated a lively formal vocabulary available for contemporary application in a time of commercial opportunity.

Models of Program and Technology

Horse racing, boxing, and cricket attracted large numbers of spectators at the close of the eighteenth century in Britain, where press coverage encouraged attendance.[41] Accommodations developed to meet demand. In the built circus, the performance activity (often equestrian in nature) shaped the venue. Philip Astley, the trick rider and showman who inaugurated circus performance in London in 1768, built several theaters in the 1770s, '80s, and '90s. Contemporary prints show these facilities as open structures. In 1804 he built a larger structure, the Royal Amphitheater, Westminster Bridge, which had ring, proscenium stage, and multiple tiers of seating.[42] In most of these buildings, amphitheatrical seating surrounded a single performance ring of 42-foot diameter, a

dimension appropriate to the repeated circular movement of a galloping horse with standing rider.[43]

In North America, the circus building was the principal form of enclosed, spectacular space, apart from the theater. Astley's associate, John Bill Ricketts, established a circus in Philadelphia in 1793 at 12th and Market Streets seating 1200 persons. Ricketts built later in New York and elsewhere, including in Montreal in 1798 a circular structure tucked into a corner of the city. Circus proprietors built roofed and unroofed enclosures, temporary and permanent, in the larger population centers. The permanent structures often combined stage and ring, with seating configured in concentric or U-shaped arrangements. Seating in concentric rings created a closed environment and heightened the intensity of the audience's experience of the activity in the ring.[44] The U-shaped seating plan emphasized action taking place on the arena floor in front of the proscenium stage. Contemporary thought on theater construction included planning at a scale large enough to provide not only theatrical space, but hotel and meeting rooms as well, as, for example, Benjamin Henry Latrobe's unexecuted design of 1797-98 for a theatrical complex in Richmond.[45] In order to increase bookings, managers attempted to present both theater and circus in a single venue, as in Philadelphia's Walnut Street Theater, erected in 1809 as a circus by equestrian showmen, or in Baltimore's New Theatre and Circus, built in 1827. In the *Picture of Baltimore* of 1832, John H. B. Latrobe and Fielding Lucas described that theater's "union of the dramatic and the equestrian."[46]

The itinerant tented circus, which traveled to its audience, became popular in the 1820s and retained its appeal well into the twentieth century. Theatrical companies

made money in theaters, but circus troupes resident in structures built for circuses usually did not. The tented circus remained in a town only as long as attendance allowed.[47] In 1854 an essay in *Putnam's Monthly Magazine* cited the theater first among the forms of popular entertainment.[48] In general, built theater eclipsed built circus. Theater had a broad scope of address. In North America as well as in Europe, spoken word, sung phrase, and designed set created a new theatrical world, in a permanent structure, every night. The circus structure became multi-purpose--or failed. In London, Frederick Hengler's Grand Cirque (1871) was replaced by the National Skating Palace (1884), which was replaced in turn by the Palladium (1910), a theatrical facility. The Cirque Fernando, proposed for Paris and published by Gridaine in 1876, was expected to host theatrical spectacle, equestrian exhibitions, concerts, and meetings in order to be successful.[49] The round or small-ovoid circus structure could be found in some North American cities at the close of the nineteenth century. For example, Thomas Wanamaker's Arena in central Philadelphia, positioned diagonally inside a one quarter-block parcel at Broad and Cherry Streets (fig. 1.8), hosted boxing. The treatment of this space in *Taking the Count* and *Between Rounds* by Thomas Eakins (both 1898-99) suggested a compact, cylindrical volume of stacked floor, press, and balcony seating. But the built circus persisted in Europe. The Cirque d'Hiver in Paris (1852) was a destination venue for decades. Munich's Zirkus Bavaria (1893) and Moscow's Cyrk Ivanovo (1931) were famous as single-purpose entertainment venues. Amplified in scale, the circus structure served the increased spectatorship of the later nineteenth century.

The Colosseum of Rome, in the guise of the enlarged circus, remained a kind of magnificent model in the nineteenth century. Contemporary descriptions focused on its picturesque, ruinous state even as it inspired new construction.[50] In a project of 1856 for a merchants' exchange for Providence, Rhode Island, Thomas Tefft placed a domed trading floor inside a five-story, Colosseum-derived exterior (fig. 1.9). With London's Royal Albert Hall of 1867-71 by Henry Scott and Francis Fowke, the ancient form and program were transformed to suit the requirements of modern commercial spectatorship.[51] Conceived in the years following the Great Exhibition of 1851, the hall was intended to serve as a venue for the meetings of societies. As first planned, the facility was to be a revenue-producing complex of event space with surrounding apartments and shops recalling the ancient configuration of Domitian's Ludus Magnus of 81-96 AD. By 1865 the Albert Hall's proposed academic elements fell away as popular entertainment replaced learned purpose. The principal structure took colossal form, without any masking surround. This left an exposed, somewhat flattened cylinder. Design strategies were available to avoid injuring the cylinder's curve while affording entrance to the facility.

In London's Ranelagh pleasure gardens near the Royal Hospital, Chelsea, attendees entered William Jones's wooden rotunda (1741) through pedimented porches.[52] Semper's Dresden Hoftheater (1838-41), having gained an international reputation, may have offered example of how a large building with a curving perimeter could be served by temple-fronted and arched penetrations.

The Albert Hall was a venue for spectacle on a large scale. Rome's series of arches and portals, differentiated by their framing orders but otherwise repeating laterally and vertically, was supplanted by a system of distinct levels. From street to roof, each level presented a distinct system of functional or decorative treatment: four porticoed entrance points, oblong windows, arched windows, mosaic frieze in terra-cotta tesserae on the masonry drum; and roof of iron and glass. The dome, supported by iron trussed ribs, was achieved by Scott with the assistance of W. H. Barlow and R. M. Ordish, engineers of the train shed at St. Pancras Station (1863-65). The arched portals of the Colosseum became arched windows placed above the ground floor. Their elaborate treatment was the product of reducing to one course the Colosseum's multiple levels of arches. Entrance porches, each consisting of a great arch, associated the elliptical building with the street geometry and managed the movement of attendees by guiding them into sorting concourses, from which they accessed the seating. The Colosseum, with a multiplicity of arched entrances at ground level, accomplished such management and sorting by closely coordinating each entrance with an interior destination. Both the Colosseum and Albert Hall required the attendee to proceed through portals to interior positions of view not apparent from the outside, in contrast with Boullée's planned Circus of the 1780s (fig. 1.10). Boullée's configuration suggested that multiple, arched entrances afforded unimpeded access to the arena, reducing the interiority of the space and weakening the spectators' privileged view. By the second half of the nineteenth century, the commercial potential of spectatorship required blockage of view from the exterior.

The genius of the Albert Hall was its calculated efficiency in accommodating, in one great space, a variety of public entertainments viewable from encircling seating. Its viability contrasted with the economic struggle of its contemporary venue in North London, the Alexandra Palace (Alfred Meeson and John Johnson, 1864-66; 1873; 1875). The burden of maintaining several compartmentalized spaces (including a central hall, theater, and concert hall) required the consistent performance of each space or the very strong draw of one of them. The private operator withdrew. Public subsidy became important, as it would be in the John F. Kennedy Center for the Performing Arts in Washington, D.C. (conceived in the 1950s, designed by Edward Durell Stone and built in 1971), for which the Alexandra Palace was a design antecedent.

In Fowke's three-tiered interior, amphitheatrical seating directed the attendees' attention to the central space, though performers generally presented from positions at the south end and without proscenium frame. A circumferential concourse offered exhibition space above the levels of seating. The amphitheater's floor could be configured for seating or for performances, athletic contests, and meetings.[53] The Albert Hall was a large, multi-purpose, roofed venue employing an arrangement of controlled entrances leading to internal, multilevel concourses. Attendees mixed with one another on the way to their seats. The design constituted the systematic model for presenting indoor spectacle in the modern era. However, the conceptual system of managed, ticketed entrance to viewable events did not determine the footprint. That was the product of the industry-generated rectangular enclosure to accommodate oval floor and seating bowl.

In North America, industry generated the structural envelope adopted by architects of roofed arenas in the nineteenth century, though the colloquial practice of calling arenas "barns" has persisted. The pitched-roof 1955 Veterans Memorial Auditorium in Des Moines, Iowa, together with many such facilities thought to be outdated, have been identified by this mild pejorative. There were, in fact, formal affinities between barn and arena. Apart from its main agricultural uses, the barn accommodated, as the manufacturing building did not, human participation (the barn dance) and spectatorship (the watchers, usually standing). This, with the addition of seating accommodation, was the program of the roofed arena as well. The column-defined basilican space allowed a central space for dancers and the perimeter for the spectators, analogous to the arena's floor and seating bowl, invaded in the first decades by columnar balcony supports. However, it is likely that the "old barn" expression derives from the highly generalized common image of the barn as a simple arrangement of walls and entrance under a pitched roof.

Industry required broad, and eventually lengthy, interior spaces for manufacturing processes. Demand for the gable roof building, such as Rhode Island's Woonsocket Company No. 1 Mill (1829; fig. 1.11), established the tripartite, continuous clerestory-lit type.[54] Iron appeared at the end of the eighteenth century in mills, initially in combination with timber and later as cast or wrought elements integral to the structure of public buildings. In Britain, iron supported the gallery in George Dance's Royal College of Surgeons (1806-13) and, together with timber and glass, formed the Crystal Palace of the Great Exhibition of 1851. By the 1820s cast iron columns held up

superimposed seating tiers in theaters, as, for example, in William Strickland's Second Chestnut Street Theater, Philadelphia (1820-22).[55]

James Bogardus, an architect and engineer inspired by classical antiquity and the potential of cast-iron construction, proposed a gigantic cast-iron amphitheater for the New York Exhibition of 1853-54 (fig. 1.12). This was, in fact, the Colosseum fully roofed by an iron sheet suspended on a catenary curve. But Bogardus may have misconstrued the program, designing too close to Rome. The winning entry, Georg Carstensen and Charles Gildemeister's Crystal Palace (1853), used cast iron, wrought iron, and glass to create a wondrous interior of booths and exhibits. Such exposition architecture did not usually have permanent seating facilities, the Interstate Industrial Exposition Building in Chicago (W.W. Boyington, 1872) being an exception. The New York Crystal Palace, together with the principal buildings of succeeding exhibitions, accommodated interior arrangements made up of discrete units. These points of attention and focus facilitated exhibition managements' desired transaction between the strolling visitor and the display; the visitor was informed, entertained, and given a commercial message. The rectangular structure specified by Carstensen and Gildemeister fulfilled exhibition management's expectations in a way that an amphitheater, designed for spectators fixing gaze on an event, could not.[56] G. Brown Goode, Assistant Secretary of the Smithsonian Institution and principal classifier of exhibits for the 1893 World's Columbian Exposition in Chicago, required the viewer to inspect presentations from close-in position. At the same time, but still secondary to the principal objective, the immense interior of a structure like George B. Post's Manufactures and Liberal Arts

Building (1891-93) offered the visitor (and reader) a long view of a landscape impressive in its dim multiplicity. The external profile of Post's building, its arcades, triumphal arches, hipped roof and monitor, appeared in all of the Exposition publications. But its interior optic, like that of most exposition buildings, did not offer arena perspective.

The metal truss of the 1850s, built first of wrought-iron beams whose triangulated internal structure controlled deflection, enabled erection of enclosures wide enough to permit placement of large machinery. Iron, subject to corrosion by smoke, gave way to steel within a few decades, usually brick-faced (fig. 1.13). Landmark projects such as Dutert and Contamin's Galerie des Machines in Paris of 1889 hastened the acceptance of the new product for deployment in long spanning.[57] The long, rectilinear factory building, with roof truss and perimeter column, beam and masonry, reflected the linear progress of raw material through stages of industrial process. But the industrial form was applicable to a range of uses beyond industrial production. In the United States, state agricultural fairs began in the 1820s with annual presentation, including horse racing, in many locations by the 1850s. The state fair, often a mobile event in the early decades, was initially a medium for disseminating pragmatic and innovative information to farmers and mechanics. By the 1880s and 1890s, states purchased permanent grounds and began to erect medium- and long-span show buildings using industrial truss work. The shed of the Georgia Railroad in Savannah (1861) accommodated the purposeful movements of passengers and trains; the gabled and monitored Boston Coliseum housed the Great National Peace Jubilee in 1869; San Francisco's Mechanics Institute Pavilion of 1881 housed the 1893 reconstruction of the

Colosseum for the spectacle "Roman Holiday," and Henry Shaw's Linnean display greenhouse in St. Louis (1882) housed the plants and served the owner and his guests. The gabled, arched or flat-roofed arena of North America was an industrial form enveloping the antique seating bowl. That form may have been offered without disguise, hidden within a city block, wrapped within an office or palace exterior, or articulated by decorative application, such as the arched window treatments and corbel tables of the *Rundbogenstil*.[58] The curvilinear arena rejected the industrial legacy but appropriated the exterior of the classical amphitheater.

Moving the seating cavity away from the sacred mountain established the stadium as a wholly built place. The freestanding stadium (or amphitheater) became a mountain with its own constructed cavity. The permeability of its exterior invited entrance to a man-made world activated by transitory events and crowds, the crowds, in Goethe's words, "bound and consolidated into a man."[59] Access to the events, and to the other people attending them, was regulated by the design of entrances, passages, and seating. Greek and Roman geometries, in service of the activities undertaken within, determined the fields of contest and display; and those revived shapes entered the development of theater, residence, circus, assembly space, and sport. The requirements of industrial production spurred the development of large roofed interiors with unencumbered central spaces. The Royal Albert Hall, a controlled-access volume inspired by an ancient example, provided the conceptual model for presentation of modern spectacle. But the Greek and Roman hippodrome, an oval fit within a circle or ellipse, provided the shape best suited to economically viable, multi-purpose

entertainment programming. Oval floor and seating bowl, legacy of the Mediterranean hippodrome, were enclosed within the roof and wall systems of the late nineteenth century.[60]

Stanford White built his roofed hippodrome, the Madison Square Garden of 1889-91, to deliver a fashionable setting to his friends in the New York Horse Show. But the Garden served a broader population as well, an audience created by changes in the worlds of work, leisure, technology, and sport. White's facility, whose impact was amplified by the communications media that disseminated both its image and the reports of its spectacle, generated successors on a continental scale.

NOTES FOR CHAPTER 1

[1] *Take Time for Paradise: Americans and Their Games* (New York: Summit Books, 1989), 32.

[2] Ionna Phoca and Panos Valavanis*, Rediscovering Ancient Greece: Architecture and City Planning* (Athens: Kedros Books, 1999), 52-53; Raymond V. Schoder*, Ancient Greece from the Air* (London: Thames & Hudson, 1974), 38, 40, 50, pl. 60; Judith Swaddling, *The Ancient Olympic Games* (Austin: University of Texas Press, 1984), 24-25.

[3] The inscription is read as a prohibition of bringing wine into the stadium. Interpreted differently, management may have wished to prohibit private stock in order to claim for itself the revenue from wine sales within the stadium. For the translation, see Georges Rougemont, *Corpus des inscriptions de delphes; École française d'Athènes* (Paris: de Boccard, 1977), 1: *Lois sacrées et règlements religieux*, 11-15.

[4] The origin of the Greek stadium is treated in David Gilman Romano*, Athletics and Mathematics in Archaic Corinth: The Origins of the Greek Stadion* (Philadelphia: American Philosophical Society, 1993). For Delos and other sites, see Schoder, 54, 56. In understanding shapes of arena seating and supporting construction it is helpful to distinguish the ellipse from the oval. An ellipse (such as the Colosseum of Rome), unlike the oval, describes a continuous mathematical curve. In the twentieth century, oval arena floors placed within elliptical or circular seating bowls created a bulge of preferred seating at the centers of both sides. The oval Greek hippodrome is discussed in John H. Humphrey, "Amphitheatrical Hippo-stadia," in *Caesarea Maritima*, ed. Avner Raban and Kenneth G. Holum (New York: E. J. Brill, 1996), 122. The ubiquitous circus ovals are illustrated in Janet M. Davis, *The Circus Age: Culture and Society Under the American Big Top* (Chapel Hill: University of North Carolina Press, 2002), 33.

[5] George C. Izenour, *Roofed Theaters of Classical Antiquity* (New Haven, CT: Yale University Press, 1992), 34, 76; Richard and Helen Leacroft, *Theatre and Playhouse: An Illustrated Survey of Theatre Building from Ancient Greece to the Present Day* (New York: Methuen, 1984), 12.

[6] Izenour, *Roofed Theatres*, 65. For Greek stadia and theaters, see Katherine Welch, "Greek Stadia and Roman Spectacles: Asia, Athens, and the Tomb of Herodes Atticus," *Journal of Roman Archaeology* 11 (1998): 117-45.

[7] Katherine Welch, "The Roman Arena in Late-Republican Italy: A New Interpretation," *Journal of Roman Archaeology* 7 (1994): 61, n. 4.

[8] Filippo Coarelli and Ada Gabucci, *The Colosseum* (Los Angeles, CA: J. Paul Getty Museum, 2001), 103.

[9] Vitruvius Pollio, *The Architecture of Marcus Vitruvius Pollio, in Ten Books*, trans. Joseph Gwilt (London: Priestley and Weale, 1826), 126; Welch, "Roman Arena," 71, 72, 76, n. 42.

[10] An oval configuration is favored by some based on the incidence of shape in facilities located in Roman colonies; see Jean-Claude Golvin and Christian Landes, *Amphithéâtres & gladiateurs* (Paris: Presses du CNRS, 1990), 59. Welch argued that the ellipse would have been a better fit within the Forum's trapezoidal space. Within an expanse of land on the American college campus, the oval shape was used to provide definition for building programs. Note Charles Bulfinch's planned placement of an oval pattern of trees in Harvard Yard in 1812 (fig. 2.17). Here, the buildings of the Yard were to be "spectators" to the "main event" placed within the oval, University Hall.

[11] D. L. Bomgardner, *The Story of the Roman Amphitheatre* (New York: Routledge, 2000), 151; Jean-Claude Golvin, *L'Amphitheatre romain* (Paris: de Boccard, 1988), 113. Hierarchical seating, reflecting distinctions of social standing and gender, was used for spectacles held in the Forum, possibly in the seating bowl-within-gallery arrangement suggested by the model reconstruction of the Ludus Magnus (81-96 AD), erected under Domitian near the Colosseum. See Filippo Coarelli, "Ludus Gladiatorus," in *Sangue e Arena*, ed. Adriano La Regina (Milan: Electa, 2001), 147-51.

[12] Bomgardner, 36.

[13] Pliny the Elder cited tribune candidate C. Scribonius Curio's publicity stunt of 53 BC, involving the pivoted moving of two back-to-back wooden theaters to form one arena enclosure. Pliny, *Natural History*, Book 36, ed. D. E. Eichholz (Cambridge, MA: Harvard University Press, 1962), 91-95.

[14] Elisha Ann Dumser, ed., *Mapping Augustan Rome* (Portsmouth, RI: *Journal of Roman Archaeology*, 2002), 44-45.

[15] Bomgardner, 4. Such conversion of private land to public purpose happened frequently in twentieth-century arena planning and construction, as, for example, when Kiel Auditorium displaced commercial property in the development of Memorial Plaza in St.

Louis in the early 1930s, or when the Civic Arena was placed next to Pittsburgh's Lower Hill district in the 1960s.

[16] Jerome Carcopino, *Daily Life in Ancient Rome: The People and the City at the Height of the Empire* (New Haven, CT: Yale University Press, 1940), 234-35; Rainer Graefe, *Vela Erunt: Die Zeltdächer der römischen Theater und ähnlicher Anlagen* (Mainz: Zabern, 1979), 17. Jean Léon Gérôme included the *velarium* in his 1859 painting *Ave Caesar! Morituri Te Salutat*.

[17] John H. Humphrey, *Roman Circuses: Arenas for Chariot Racing* (Berkeley: University of California Press, 1986), 122.

[18] Lucretius, *On the Nature of Things*, Book 4, ed. and trans. Anthony M. Esolen (Baltimore: Johns Hopkins University Press, 1995), 124.

[19] Rodolfo Lanciani, *The Ruins and Excavations of Ancient Rome* (1897; repr., New York: Benjamin Blom, 1967), 380.

[20] Bomgardner, 63; Coarelli and Gabucci, 132; Jonathan Edmondson, "Dynamic Arenas: Gladiatorial Presentations in the City of Rome and the Construction of Roman Society during the Early Empire," in *Roman Theater and Society: E. Togo Salmon Papers I*, ed. William J. Slater (Ann Arbor: University of Michigan Press, 1996), 87-94; William L. MacDonald, *The Architecture of the Roman Empire,* 2: *An Urban Appraisal* (New Haven, CT: Yale University Press, 1986), 75. For the Circus Maximus, see Allen Guttmann, *Sports Spectators* (New York: Columbia University Press, 1986), 28-31, and Lawrence Richardson, Jr., *A New Topographic Dictionary of Ancient Rome* (Baltimore: Johns Hopkins University Press, 1992), 84-87.

[21] Livy, *History of Rome*, Book 41, trans. E. T. Sage and A. C. Schlesinger (Cambridge, MA: Harvard University Press, 1938), 277, 279.

[22] William L. MacDonald, *The Architecture of the Roman Empire*,1: A*n Introductory Study* (New Haven, CT: Yale University Press, 1965), 167, 169; Norbert Wolf, *Giovanni Battista Piranesi, der Römische Circus: die Arena als Weltsymbol* (Frankfurt: Fischer Taschenbuch, 1997), 28-29.

[23] Mariarosaria Barbera, "Un Anfiateatro di corte: il Castrense," in La Regina, ed., *Sangue e Arena*, 135. One continues to find references to adjacency of facilities in antiquity in promotional literature issued by present-day venues struggling to survive in the marketplace. In addition to the Meadowlands example (Giants Stadium and the Meadowlands Racetrack), see the 1990s publications advertising Robert F. Kennedy Stadium and the District of Columbia Armory, e.g., *Where the Stars Come Out To Play!* (Washington, DC: District of Columbia Armory Board, n.d.).

[24] An inscription at the Jerash hippodrome refers to the resident athletes (i.e., runners) as well as horses. The Circus Maximus had long accommodated a mix of events. See Adolf Hoffmann and Susanne Kerner, eds., *Gadara, Gerasa und die Dekapolis* (Mainz: Zabern, 2002), 17, 87; Carl Kraeling, ed., *Gerasa, City of the Decapolis* (New Haven, CT: American School of Oriental Research, 1938), 97.

[25] Bomgardner, 90, 97, 192, 222. However, the hippodrome in Constantinople, begun in the second century AD in the form of the Circus Maximus, retained vitality for centuries. Chariot races were held there as late as the twelfth century. It was known in Turkish as "Atmeydan," the "horse place." Illustrations of sixteenth-century spectacles prepared for the sultan in the hippodrome appeared in manuscript books created during the final centuries of the Ottoman Empire. See Sarah Guberti Bassett, "The Antiquities in the Hippodrome of Constantinople," *Dumbarton Oaks Papers* 45 (1991): 87-96; John Freely, *Byzantine Monuments of Istanbul* (New York: Cambridge University Press, 2004), 13, 16, 17; Mazher S. Ipsiroglu*, Masterpieces from the Topkapi Museum: Paintings and Miniatures* (London: Thames & Hudson, 1980), 113-17; Wolfgang Müller-Wiener, *Bildlexikon zur Topographie Istanbuls* (Tübingen: Ernst Wasmuth, 1977), 64-71.

[26] John Onians, *Bearers of Meaning : The Classical Orders in Antiquity, the Middle Ages, and the Renaissance* (Princeton, NJ: Princeton University Press, 1988), 114.

[27] Jan Bialostocki, *Art of the Renaissance in Eastern Europe: Hungary, Bohemia, Poland* (Ithaca, NY: Cornell University Press, 1976), fig. 283; Allen Guttmann, "Sports Spectators from Antiquity to the Renaissance," *Journal of Sport History* 8, no. 2 (Summer, 1981): 13; Thomas S. Henricks, "Sport and Social Hierarchy in Medieval England," *Journal of Sport History* 9, no. 2 (Summer 1982): 22, 30; Leacroft, 40. In the Islamic world, the great arcaded or colonnaded spaces of the congregational mosque (e.g., Cordoba, Umayyad Period, begun in 785) and caravanserai (e.g., Madrasa Mader-I Shah complex, Isfahan, ca. 1600) were intended for worship and travelers' rest, respectively, but functioned as social centers as well. Spectators observed spear-play demonstrations in the mosque. John L. Esposito, ed*., Oxford Encyclopedia of the Modern Islamic World* (New York: Oxford University Press, 1995), s.v. "Games and Sport." For the Great Mosque at Cordoba, see George Michell, ed., *Architecture of the Islamic World: Its History and Social Meaning* (New York: Morrow, 1978), 212.

[28] See *The Builder's Dictionary, or, Gentleman and Architect's Companion* (London: A. Bettesworth, C. Hitch, S. Austen, 1734), n.p.; Charles François Roland Le Virloys, *Dictionnaire d'architecture, civile, militaire et naval* (Paris: Les Libraires Associes, 1770), 58-59; Christian Ludwig Stieglitz, *Encyklopädie der bürgerlichen Baukunst* (Leipzig: Caspar Fritsch, 1792-98), 21-23; Robert Stuart, *A Dictionary of Architecture* (London: Jones & Co., 1830), n.p.; and *idem*., Philadelphia ed. (A. Hart, late Carey & Hart, 1854), 159.

[29] For the geography and organization of theatrical space, see Yi-fu Tuan, *Segmented Worlds and Self: Group Life and Individual Consciousness* (Minneapolis: University of Minnesota Press, 1982), 86-113.

[30] *Treatise on Architecture*, 1: *Translation,* trans. John R. Spencer (New Haven, CT: Yale University Press, 1965), Book 12, Folio 87r.

[31] See David R. Coffin, *Pirro Ligorio: The Renaissance Artist, Architect and Antiquarian* (University Park: Pennsylvania State University Press, 2004), 53-62; Wolfgang Lotz, *Architecture in Italy, 1500-1600* (New Haven, CT: Yale University Press, 1995), 107.

[32] John Summerson, *Architecture in Britain, 1530 to 1830* (New Haven, CT: Yale University Press, 1993), 316, 318.

[33] Andrew Hopkins, *Italian Architecture from Michelangelo to Borromini* (London: Thames & Hudson, 2002), 174-76. The auditorium of the Masonic Temple in Madison, WI (James R. and Edward J. Law, 1923-26), was a twentieth-century derivative. Seating provided the occupants with views of floor and stage.

[34] Charles-Nicolas Cochin, *Voyage d'Italie* (Paris: Jombert, 1758), 1: 67-68.

[35] Nikolaus Pevsner, *A History of Building Types* (Princeton, NJ: Princeton University Press, 1976), 67; Giuliana Ricci, *Teatri d'Italia: Dalla Magna Grecia all'Ottocento* (Milan: Bramante, 1971), 108-09.

[36] For these, see, e.g., respectively, Marie-Joseph Peyre, *Oeuvres d'architecture* (1765; reprint, Farnborough, Hants: Gregg Press, 1967), 3; Wend Graf Kalnein and Michael Levey, *Art and Architecture of the Eighteenth Century in France* (Harmondsworth: Penguin Books, 1972), 173-74; Damie Stillman, *English Neo-classical Architecture* (London: Zwemmer, 1988), 2: 473; David N. King, *The Complete Works of Robert and James Adam* (Oxford: Architectural Press, 2001), 230; Summerson, 397; and John Soane, *Designs for Public and Private Buildings* (London: Priestley & Wade, Rodwell, Colnaghi & Co., and Ridgeway, 1828), 23; Gillian Darley, *John Soane: An Accidental Romantic* (New Haven, CT: Yale University Press, 1999), 27; and Stillman, 1:61.

[37] King, 50-51; Stillman, 2: 486.

[38] John Joseph Bishop, "The Role of the Circus and Crescent in 18th and 19th Century British Town Planning" (Ph.D. diss., Boston University, 1962), 1.

[39] Ibid., 138; Michael Hugo-Brunt, "George Dance, the Younger, as Town Planner," *Journal of the Society of Architectural Historians* 14, no. 4 (Dec. 1955): 17.

[40] Johann Wolfgang von Goethe, *Italian Journey*, ed. Thomas P. Saine and Jeffrey L. Sammons, trans. Robert R. Heitner (New York: Suhrkamp, 1989), 37, 40-41.

[41] Dennis Brailsford, "Sporting Days in Eighteenth Century England," *Journal of Sport History* 9, no. 3 (Winter 1982): 1-2; Allen Guttmann, "English Sports Spectators: The Restoration to the Early Nineteenth Century," *Journal of Sport History* 12, no. 2 (Summer 1985): 112-15.

[42] Augustus Pugin, *Illustrations of the Public Buildings of London with Historical and Descriptive Accounts of Each Edifice*, ed. W. H. Leeds, 2nd ed. (London: John Weale, 1838), 1: 358-59.

[43] Davis, 240, n. 4; Antony Hippisley Coxe, *A Seat at the Circus* (London: Evans Brothers, 1951), 22; James S. Moy, "John B. Ricketts' Circus, 1793-1800," (Ph. D. diss., University of Illinois, 1977), 6, 8, 52-53; Charles F. Partington, *National History and Views of London and Its Environs* (London: Allan, Bell, 1832), 1: 111.

[44] Coxe, 17. For Ricketts' Montreal building, see Université du Québec, "Map," www.er.uquam.ca/nobel/C2545/ricketts.html (accessed March 29, 2004).

[45] Jeffrey A. Cohen and Charles E. Brownell, *The Architectural Drawings of Benjamin Henry Latrobe* (New Haven, CT: Yale University Press, 1994), 126.

[46] John H. B. Latrobe and Fielding Lucas, *Picture of Baltimore, Containing a Description of All Objects of Interest in the City* (Baltimore: F. Lucas, Jr., 1832), 189.

[47] Local newspapers, in this case the *Detroit Daily Advertiser* of July 3, 1843, provided free publicity: "The Arena, or Great Western Circus, is now in this city, and will commence their performances today. This is said to be the most splendid circus that has ever visited the city." See also Richard W. Flint, "The Circus in America + Posters," *Quarterly Journal of the Library of Congress* 40, no. 3 (Summer 1983): 209.

[48] "Places of Public Amusement," *Putnam's Monthly Magazine* 3, no. 14 (Feb. 1854): 149, 152. Cornell University Library Digital Collections, "Making of America," http://cdl.library.cornell.edu/moa/browse.journals/putn.1854.html (accessed July 23, 2005).

[49] Charles Alfred Oppermann, "Le nouveau Cirque Fernando," *Nouvelles Annales de la Construction* 22 (September 1876): 261, cols. 138-140.

[50] Francesco Milizia, *The Lives of Celebrated Architects, Ancient and Modern* (London: J. Taylor, 1826), 1: 89.

[51] See *American Architect and Building News* 2, no. 58 (February 3, 1877): 40; "Designs for the National Albert Memorial," *The Builder* 21, no. 1052 (April 4, 1863): 233; "Royal Albert Hall," in *Survey of London*: *The Museums Area of South Kensington and Westminster*, ed. F. H. W. Sheppard (London: University of London, 1975), 38: 177-95.

[52] "The Royal Hospital, Chelsea," in *Survey of London*, ed. Walter H. Godfrey (London: B. T. Batsford, 1927), 2: pl. 5; William Wroth Warwick, *The London Pleasure Gardens of the Eighteenth Century* (1896; repr., Hamden, CT: Archon Books, 1979), 25, 199, 215.

[53] John Weale, *Rudimentary Dictionary of Terms Used in Architecture* (London: J. Weale, 1849-50), 28.

[54] For mills and barns see, respectively, Ted Sande, ed., *New England Textile Mill Survey* (Washington, DC: Historic American Buildings Survey, 1971); and Robert Ensminger, *The Pennsylvania Barn: Its Origins, Evolution, and Distribution in North America*, 2nd ed. (Baltimore: Johns Hopkins University Press, 2003). The barn's impress on the cultural landscape is explored in Bernard L. Herman, *Architecture and Rural Life in Central Delaware, 1700-1900* (Knoxville: University of Tennessee Press, 1987); Thomas C. Hubka, *Big House, Little House, Back House, Barn* (Hanover, NH: University Press of New England, 1984); and Gabrielle M. Lanier and Bernard L. Herman, *Everyday Architecture of the Mid-Atlantic* (Baltimore: Johns Hopkins University Press, 1997). Accommodation for horses produced large, pitched roof structures, such as the 1891 breeding barn by R. H. Robertson at Shelburne Farms, Vermont. See Jennifer "Perky" Beisel, "The American Upper Class and the American Horse Industry from 1865 to 1929" (Ph.D. diss., Middle Tennessee State University, 2005), 374; and Julius Trousdale Sadler, Jr., and Jacquelin D. J. Sadler, *American Stables: An Architectural Tour* (Boston: New York Graphic Society, 1981).

[55] See discussion in Carl W. Condit, *American Building: Materials and Techniques from the First Colonial Settlements to the Present* (Chicago: University of Chicago Press, 1982), 79; *Philadelphia in 1830-1: or, a Brief Account of the Various Institutions and Public Objects in this Metropolis* (Philadelphia: E. L. Carey and A. Hart, 1830), 141.

[56] "Letters About the Exhibition," *New York Tribune Extra no. 35*, 1876, 3; U. S. Centennial Commission, *International Exhibition, Fairmont Park, Philadelphia, 1876: Acts of Congress, Rules and Regulations, Description of the Buildings* (Philadelphia, 1875).

[57] *American Architect and Building News* 22, no. 623 (Dec. 3, 1887): 272; Betsy H. Bradley, *The Works: The Industrial Architecture of the United States* (New York: Oxford University Press, 1999), 138-40, 144, 181; Chris Wilkinson, *Supersheds: The Architecture of Long-Span, Large Volume Buildings* (Boston: Butterworth Architecture, 1996), vii-ix, 6.

[58] See Kathleen Curran, *The Romanesque Revival: Religion, Politics, and Transnational Exchange* (University Park: Pennsylvania State University Press, 2003), xxiv, 24, 53.

[59] Goethe, *Italian Journey*, 37.

[60] By this time, the meaning of the word hippodrome had become generalized well beyond its original application to a specific purpose and shape. The Toronto and Baltimore Hippodromes of 1914, for example, were simply large theaters. The word itself retained and projected a kind of power, its "-drome" root modified by "auto-", "aero-", and even "amphi-" in the early twentieth century to create Corbusian terms evoking new technology, sport, and speed as well as, in the last variation, enclosure.

Chapter 2

REEMERGENT VENUE FOR COMMERCE AND CIVIC IDENTITY

1873-1918

By the last quarter of the nineteenth century, an individual's waking time away from work was more than simply "other" time. It became an object of commerce. In return for value offered, an individual could choose to recreate by observing an activity or contest.[1] The changes in how regularized and increased leisure opportunities were expended were linked to the nation's urbanizing trend. Industrialization shifted the labor force toward city concentrations, spurring mass transit and reducing the appeal of such older attractions as the small itinerant circus, whose numbers declined after 1903.[2] From 1860 to 1910 the number of American cities with populations over 100,000 increased from nine to fifty. The population of New York City, where the roofed arena took hold, increased eightfold between 1840 and 1900. Between 1870 and 1900, real income for non-farm employees increased by more than 50 percent while the cost of living and work hours decreased.[3] The North American railroad, nearing the height of its development, tied together cities and towns across the continent and enabled masses of

people to converge for meetings based on their occupation, trade, or religious practice. Electricity was affordable and, by 1890, lit the entrepreneurial venues of pleasure and leisure and facilitated the newspaper advertising of the activities that were presented at those sites. The movies were founded on electricity and gained through advertisement. In 1900 there were 50 movie theaters in New York; by 1908 there were more than 400, serving 200,000 viewers daily.[4] Electric service supported the development of large venues located at resort towns reachable by train from city centers. On the Jersey shore, the Ocean Grove Camp Meeting built in 1894 a large auditorium whose central attraction was an electric organ designed by a telephone engineer.

Newspapers had long furnished the reading audience with access to a commodity most precious to private enterprise, advertising. Mass advertising practice emerged in nineteenth-century newspaper promotion of patent medicines. Earnest Elmo Calkins articulated the profession's objective in the early twentieth century: "Customers buy, believe and think the things that the advertiser wants them to buy, believe and think."[5] The arena contained spectator seats and a floor. Many events were contests, reportable in media supported by advertising. In New York in 1898, forty-three newspapers published every day, many reporting and advertising sports through text and image.[6] The emergence of New York, Chicago, San Francisco, and other cities as communications hubs, together with the activity of wire services and specialized newspapers, brought information to multiple target audiences.[7] Professional trade media informed the individuals and firms whose business it was to design and build sporting venues illuminated by incandescent electrical lighting. Outside lighting carried the

messages of advertising in urban areas, such as New York's Madison Square, where companies bid for favored positions.[8]

Forming the Arena Spectators' Environment

The modern roofed arena's volume and positions of view were coordinated to enable the spectator to comprehend movement in middle distance. But an arena's dimensions were not usually particular to the display of one kind of activity. It was a space generalized for multiple purposes and formed by site, context, and circumstance. Uses changed over time, with new activities accommodating themselves within existing space. Nevertheless, the essential influence was the same in the modern period as it was in the antique: equestrian-based spectacle shaped the oval or elliptical focal area above and around which were placed the arena's roof, seating bowl, and attendee circulation system. Applied technologies of commercial electricity, lighting, and heating made it possible to control interior conditions. Rail passenger transportation facilitated mass assembly and encouraged the erection of buildings to suit. But rapid communication of factual and interpretative content via newspapers, telegraphy, telephone, and broadcasting threatened to render placeless the event that lit the dark arena and brought to it paying spectators. Still, the source activity remained central, whether located in a purpose-built venue or in a location appropriated for temporary use. For attendees, the event was not represented by a description crafted by writers and presented through communications media. People attended based on elements of appeal, including the emotional pull of athletic competition between individuals and teams. But the secondhand representation of

the activity through presentation in print and broadcast media created an audience far beyond the confines of the site. At first, venue management's proprietary interest in the site was served primarily by the ability of event reporting to build and sustain interest among attendees and encourage them to return again and again to support their teams or cheer individual accomplishment. Eventually, the live event spawned media presented by management within controlled space--initially, printed programs and advertisements mounted on architectural surfaces. Handbills, used tickets, and souvenirs were portable artifacts of media and represented a concentration of energy outside of the arena. Ultimately, media threatened to render the actual event ancillary to its representations, which were driven by management's economic objectives.

As an instrument of development, the railroad enabled junction cities across the continent to present commercial and political conventions in structures built for gatherings approaching 10,000 persons. Rail transportation facilitated the event, and the event generated the structure. Chicago's Wigwam was one of the earliest and largest of these. Erected by the business community in 1860 for the expressed purpose of accommodating the nominating convention of the Republican Party, the Wigwam occupied the site of a hotel, the Sauganash, that had previously served the city as a meeting location. Built on a scale suited for a national audience, the Wigwam's two-story height concealed a sky-lit, arched-roof timber shed. Attendees viewed a broad stage from a wraparound balcony. Seating on the main floor was not rigorously separated from stage space.

Beginning in the 1840s, sports enterprises appropriated land for activities viewable by paying and wagering attendees. Organized events in reserved space replaced informal play in open areas. Competition beyond the local area increased and was reported on a regular basis.[9] The "New York game" of baseball issued rules in 1846 and may have been played in Hoboken, NJ, in that year. By the 1860s baseball teams erected fenced parks and charged admission.[10]

Horse racing in New York began in the seventeenth century and was subject to periodic prohibition and reinstatement. Racing's spectator accommodation included operational features that were appropriated by designers of open stadia and roofed arenas. Sixty thousand people witnessed a race at the Union Course in Queens in 1823.[11] The sport's appeal was enhanced by the facilities constructed for its viewers by racing associations, whose operating perspective became business-driven after mid-century. The Saratoga Association's two-hundred-foot colonnaded grandstand of 1863 was oriented to the homestretch, defined as the distance between the last turn and the winning post. The seating accommodations represented a concentrated reduction from the hippodrome's continuous seating arranged around an open or closed oval. The grouping together of attendees increased the service efficiency of the refreshment rooms and lounges located underneath the stands. Charles Wheatly's Saratoga grandstand, with accessible paddock, track, and press box, was one of the first revenue-centered, public spectator-based, sports venues. Management's monetary return consisted of the wagering pool, the admission price, and concession proceeds. Admission revenue was only one element of the larger stream. As such, the nineteenth-century racetrack established the concession marketing

later embraced by arena management. Saratoga's packaging of media-reported spectacle with impulse spending was copied at the Bronx's Jerome Park in 1866 and elsewhere.[12]

Agricultural Fair Exposition

The first wave of construction of arenas with permanent seating was based on the judgment of public entities that seated crowds were critical to the success of the North American agricultural fair as it developed into a large enterprise in the last decade of the nineteenth century. Agricultural fairs, consisting of state-sponsored showcases of the products of American agriculture and technology, began to be held in the 1820s and became annual events in the 1850s. By 1868 there were over two hundred agricultural societies.[13] The fairs usually were held in a different town each year, near a revenue-producing outdoor oval racetrack with grandstand.

The fairgrounds arena usually was built 40 or 50 years after the beginnings of an agricultural fair in North America. It was, typically, a pitched-roof form located at a city's edge on former pastureland acquired by the municipality in the early decades of the nineteenth century. These exhibitions of agricultural and mechanical products and methods were popular from the start, with the 1841 New York event in Syracuse drawing 15,000 farmers. The 1852 fair used the Castle Garden entertainment venue in New York to accommodate displays presented by 2,000 exhibitors and viewed by more than 100,000 paying guests.[14] By 1868 there were hundreds of agricultural societies in the United States. But static exhibits, examined by visitors milling about, did not require a seating bowl or circulation system.

The development of rail connections in the last decades of the century redistributed the attending population, reducing the number at smaller venues and building business in the larger centers. Wagering on horse races at the fairs' outdoor tracks continued to be the main revenue source at many venues, but management needed more all-weather attractions and spaces. Public attendance remained strong, but the analysis after the 1896 New York fair indicated the need for a carrot: "After the educational came the amusements and entertainments, which have become a necessary adjunct to all great fairs. It has been found by experience that the mass of the people require something more than a purely educational show of live-stock and agricultural products to induce them to visit our State Fair."[15]

During the 1890s one building significantly larger than the others often was built to house the indoor components of the new entertainment programming. The necessity to accommodate track and field events or equestrian display (other than horses running around in a circle) favored the oblong, pitched- or arched-roof shed over the circular show ring.

If the amphitheater interior was a world apart from the building exterior, that exterior--the grounds of the fair--was an environment different from the world on the other side of the entrance gates. Within the campus, the state authority could attempt to create a consistency of architectural style in contrast to the wider world's disparate streetscape and increasing cacophony of commercial graphics. Alternatively, the state authority could choose to reject the use of attributes of architectural style in favor of an essentially unaestheticized adoption of industrial forms. There was freedom to juxtapose

buildings of radically differing style and to place single buildings carrying strong identification of style. The forces of ownership, property valuation, economic performance, and design conception and options were not unitized in small scale along streets but brought together in large scale inside the entrance. The result could be visual uniformity or multivalence.

By 1900, fair managements throughout the country recognized the economic advantage of selecting permanent sites and erecting larger buildings suitable for fair-based competitions and paid performances. In Dallas, the building constructed for exhibition of machinery was converted to an auditorium.[16] The executive board of the New York State Agricultural Society affirmed in 1898 that the attending public required amusements and entertainment in order to be able to absorb the "educational idea" of the fair.[17] State agricultural societies began to fund part of the cost of presenting annual fairs with revenue gained from entertainment presented in roofed arenas configured around oval floors. Cattle stock pavilions rose in Chicago (by Holabird & Roche for the 1893 World's Columbian Exposition), Springfield (Illinois) and Ottawa and later in Des Moines, Syracuse, Denver, Winnipeg, Edmonton, and other rail-accessible cities, and at educational institutions with agricultural curricula serving local needs, such as the University of Wisconsin in Madison.

In the first decades of the twentieth century fairground planning exhibited the new roofed arenas both as component parts of larger schemes and as sizable outliers. Some, considered as individual buildings, resisted categorization. The Vancouver Horse Show Building of 1909 or earlier (fig. 2.1) displayed cavetto moldings topping truncated

watchtowers and arched entrances and, with its window positions suggestive of both administration and surveillance, had the characteristics of a secure facility. The Minnesota State Fair Amphitheater, Hamline (William M. Kenyon, 1910-12; fig. 2.2) was sheathed in Mission associations of scalloped facades, towers and arcades. The choice of the exotic demonstrated the State Fair management's rejection of the ideas submitted by Reed & Stem a few years earlier. That firm's gigantic scale and Renaissance-derived arcaded forms seemed to shackle the fair to an insupportably grand presentation.[18] As built, the Minnesota facility was studied by planners of subsequent fairgrounds buildings, among them the Edmonton Exhibition Association Stock Pavilion, later Edmonton Gardens (Rollie Lines, 1910-13; renovations ca. 1950; fig. 2.3). There may have been some useful information gleaned by the Edmonton architects, though their building's presentation of exposed and monitored pitched roof with terminating wall and peculiar Palladian reference was clearly industrial.

Within the fairgrounds environment, the pressure to generate revenue did not necessarily mean creation or expansion of concession space within the arena concourse. The Coliseum at the Eastern States Exposition in Springfield, MA (James H. Ritchie; Albert Taylor, Landscape Architect; 1916; figs. 2.4-2.5) offered an internal circumferential cross aisle at floor level for standing room and a minimal concourse behind the seating bowl. Attendees had numerous food, beverage, and souvenir choices in the array of barns and ancillary buildings surrounding the main arena. The Exposition was a regional effort involving the New England states; as such, the Coliseum (on whose walls were mounted heraldic tiles of the states) was not in competition. The fair's central

axis brought the visitor directly to the Coliseum and associated buildings. The arena's main face reflected Ritchie's use of the triumphal arch and flanking arches system from Daniel Burnham's Union Station in Washington (1903-08). The architect positioned partial clerestories to light the inside and break the roof form. The Springfield building's clerestory and colored-tile-decorated central and flanking pavilions were designed to ease the disjuncture between the barn-like enclosure and the appended entrance. At Springfield, and most other fair arenas, the interior was plain and without theatrical decoration and finish. Attendees reached the single rank of seating from an exterior concourse whose dimensions were defined by the building perimeter and offices.

Athletics Make Place

The roofed arena took form during the period from the last quarter of the nineteenth century through World War I. Convention business and equestrian-based spectacle were joined by presentation of athletic contests played under coordinating federations of greater or lesser organization and financial base. The entertainment attraction of boxing had been established and continued, but the general participatory and spectatorial appeal of ice hockey and basketball was a facility-constructing force. These sports generated cohorts at every degree of association and became identified with schools, social organizations, towns, and cities.

Recreational ice skating and organized ice hockey were outdoor activities that eventually moved to indoor accommodations made possible by refrigeration technology. Ice under roof attracted recreational skaters in eastern Canada in the 1860s.

Club members formed unincorporated companies to pool resources in order to build such rinks. By 1870, a dozen were operating as private social clubs. Some failed to sustain themselves and began to admit the public for a fee. Some of these facilities may have been able to make artificial ice.[19] A game of hockey was played in Montreal's 1862 Victoria Skating Rink (*patinoir*; designed by Lawford & Nelson) in March, 1875. This is the earliest record of a specific game in a specific time, with a recorded score, between two identified teams.[20] The Victoria facility (fig.2.6), a walled and roofed structure of wood and brick, had no seating bowl.[21] There was little or no spatial boundary between participant and spectator. Contemporary images of hockey being played indoors show players and spectators milling about in the same general area. Balcony seating, a feature of roller skating rinks of the period, was sometimes provided (fig. 2.7). Towns across Canada raised funds to build their own wooden facilities following plans published in *Canadian Architect and Builder.*[22] Skating rinks equipped with little more than benches for resting participants occupied leftover urban property as opportunity businesses during the international roller skating craze in the 1870s and 1880s or used space in industrial buildings (fig. 2.8). Later, municipalities, park districts, and private organizations and ventures throughout the continent built ice rinks and roller rinks primarily for skaters, such as Baltimore's small but centrally located ice facility on North Avenue near Charles Street (1894), the St. Nicholas Skating Rink on Manhattan's west side near Central Park (Ernest Flagg and Walter B. Chambers, 1896), and New Haven's Roll-A-Round rink at the edge of downtown (ca. 1935). If the project sponsorship found a site in the urban grid, the building was likely to look like a generic commercial structure. If sponsorship located

the building in or near a public park, other options came into play. The St. Nicholas Club's frontage on 66th Street was an obvious copy of the Copley Square presentation of the Boston Public Library (McKim, Mead & White, 1888-95).[23]

Competition attracted people who wanted to see their local team win, providing the kernel of a business approach to the enterprise. St. Paul's School in Concord, NH, facilitated in 1883 the publication of hockey rules. The first professional league was organized in 1894.[24] In the western upper peninsula of Michigan several small, steel-arched enclosures were built with permanent, if minimal, seating for the presentation of professional hockey games.[25] An Ottawa facility, built by the Dey Brothers of that city in 1896, included gallery seating at one end. The design demonstrated the beginning of the displacement of promenade space by permanent spectator accommodation, a change that took hold in the early years of the twentieth century. Dey also built in the United States.[26] The promenade moved to a distinct perimeter position and became the concourse--initially a necessary but utilitarian path for moving people inside the bowl, later in the century the locus of a series of revenue-generating concessions.

At the end of the nineteenth century recreation and participation joined spectatorship as defining elements in the shaping of indoor leisure accommodation. The game of basketball, invented in 1891 by James Naismith at the International YMCA Training School (later Springfield College) in Springfield, MA, was a competitive, team-based activity created for a class of students but observed by others soon after its beginning. The proportions of its court and the placement of its elevated goals were at

first determined by the given size of the exercise apparatus-filled room of the nineteenth-century gymnasium and the height of the railing enclosing its second-floor running track. Basketball acquired fixed court dimensions and rules as Naismith's students brought the game home and then to high schools, colleges, and the world.[27] Sponsoring institutions, oriented to business or education, recognized the game's potential for building school identity or for generating revenue and calculated the capacity of their indoor facilities to suit the scale of their expectations. By 1896, professional basketball was being played--sometimes within a fishnet cage--in, for example, the Masonic Hall, Trenton, NJ, and in almost any public or semi-public building capable of seating at least a few hundred people.[28] The professional game moved from the YMCA gyms to rented venues. Admission fees helped pay the rent, with leftover dollars distributed to the players.

Spectators viewed contests and events in existing buildings pressed into temporary service for purposes not contemplated in design. The experience of performing, competing, and observing in provisional settings built a base of shared opinion that informed the gradual development of facility standards. Some events occurred in structures designed without spectatorship in mind. For example, the New York Athletic Club's First Semi-Annual Games in 1868 were held in the Empire City Skating Rink.[29] Exposition buildings were temporarily configured for circuses, whether in Louisville in 1874 or Paris (in Dutert and Contamin's Galerie des Machines of 1889) in 1901.[30] Much new construction followed the industrial model of the monitored pitched-roof shed. Large facilities, such as Boston's 1869 venue for its post-Civil War

peace celebration (and commercial extravaganza), emphasized foursquare seating and restricted accommodation for attendee circulation (fig. 2.11).

Urban athletic club gymnasia and neighborhood fight clubs often used designations such as arena, garden, palace, and coliseum but generally held less than 2,000 persons in 300-square-foot rooms of multi-storied, multi-tenanted buildings. Spectators sat on temporary riser seats in auditoriums of fraternal and social organizations in towns and villages throughout North America, such as the Town Building and Opera House in Littleton, NH (Howard and Austin, Brockton, Massachusetts; 1894-95).[31] These balconied, multiple-windowed civic centers of the 1880s and 1890s, often called opera houses though opera may seldom have been presented after the first few decades, accommodated town meetings, theatrical performances, lectures, political events, and, by removal of chairs from the main floor, athletic contests. A proscenium stage usually was located at the end, opposite the main entrance. The balcony seating described a half oval and provided a view of the main floor as well as the stage. Some of these buildings, like the Pythian Opera House in Boothbay Harbor, Maine, remained in use well into the late twentieth century.

Cities also had Salvation Army halls and clubs organized around immigrant nationalities. Churches and their associated buildings (e.g., congregational church houses in New England) have been used for games and nave-sited spectacles. Dance halls, amusement park pavilions, theaters, and community meeting halls served a public seeking entertainment by making their spaces available in return for a rental fee or a portion of the paid attendance. Ballrooms, such as the Grand Prospect Hall in Brooklyn,

NY of 1892, or the Colorama Ballroom of the St. George Hotel in the same city (Emery Roth, 1930; fig. 2.12) were used for basketball and dancing during the same evening. The ballrooms' and dance halls' proportions and built-in seating accommodations in stacked tiers were suitable for medium-sized crowds. Perimeter bays afforded some space for spectators, often only at floor level. Promoters presented boxing in a multitude of environments, including union halls and banquet facilities, such as Rhodes-on-the-Pawtuxet in Cranston, RI (1875; rebuilt 1915). Adolf Sutro's baths (C. J. Colley and Emil S. Lemme, 1896) drew San Franciscans for recreation and entertainment. Interior spaces for ratting and other low sports attracted spectators seated on risers of board. In Washington, DC, in the 1960s, spectators watched professional wrestling in a converted automobile garage known as the Capitol Arena.[32] Vince McMahon, Sr., the son of Jess McMahon (one of Tex Rickard's associates), understood that the modest garage environment could perform very well as a venue for the dissemination of the event by television broadcast supported by advertisement. Theaters, hotels, and fraternal halls were used for presentation of sports events, as, for example, Dan Mendoza's theater in the Strand, London, for boxing in the 1790s; Shakespeare Hotel, New York, in 1848; and Germania Maennerchor Hall, Baltimore, in 1907.[33]

Armories

Armories, present in large numbers and usually available, attracted events and spectatorship before, during, and, indeed, after the establishment of the roofed arena as a recognizable package of elements. In the United States armories were first built to provide urban headquarters for local militia in the post-Civil War period.[34] The railroad's head house and shed configuration was comparable to the armory's administrative, meeting, and drill spaces. Experience gained in the design and construction of armories informed the architectural profession about the spanning of long spaces. But it was not central to the development of the roofed arena because of the arenas' definitive inclusion of a seating bowl and extensive circulation system, elements absent from armory architects' responsibilities. Some rhetorical influence can be seen in the battlemented presentation of some college and university gymnasia (e.g., David R. Francis Gymnasium, Washington University, St. Louis, 1903). By the end of the nineteenth century, armories' identification with controlling military purpose had lessened in favor of a developing recognition of their public benefit. Civic reformers argued for their availability for civic gatherings, dances, and athletics[35] ; and most state militias allowed them to be used for non-military purposes.

Planners of the period began to consider the construction and placement of a new armory as a means of advancing a city's aesthetic standing. This argument held that the armory could replace unsightly industrial ground, screen low-grade construction from view, be grouped with other public buildings, and therefore improve overall civic

presence. By design, Connecticut's Arsenal and Armory Commission located the axis of Hartford's new, stone-resplendent armory (fig. 2.14)[36] on former railroad property purchased by the state, directly on the site of an obsolete locomotive turntable, near and complementary to Richard Upjohn's state capital.[37] Some armories of the early twentieth century were used as instruments of urban change in this way, anticipating the comparable later use of arenas by the successors of the City Beautiful planners. Others, such as the Cranston Street Armory in Providence, RI (William R. Walker & Son, 1907), affected their surroundings primarily through great bulk. Richmond's contemplated combined armory and auditorium/arena had to be moved away from the Virginia State Capital-centered civic group due to the huge mass required by armory drill needs.[38]

Overall, armory design affected arena design primarily through the development of roof support systems. The armory interior was not designed for spectators, though the architect was sometimes required to provide a ticket office and public facilities. The armory had rooms arranged along the sides for participants in drill floor activity or for meetings of groups entirely apart from drill. The space given to these rooms was the space devoted in arena settings to concessions, concourse, and storage. The drill hall accommodated only temporary risers and shallow second-floor perimeter balconies, similar to the galleries in the equestrian facilities of the eighteenth century (e.g., the Winter Riding School in the Vienna Hofburg of 1729-34), and provided relatively few seats. Armories did not have systems of concourses or passages to help people move in and out of the main space. Architects provided priority access to the offices and rooms of the head house near the entrance. In the Seventh Regiment Armory

in New York (Charles Clinton, Louis C. Tiffany, and Stanford White, 1877-80) the architect created a hierarchy of form within the engineering supporting the roof. Arched metal supported the central monitor, which was supported below by horizontal trusswork. The higher one looked, the higher the order of decoration. This was not typically done in roofed arena work, where roof support was tasked to fulfill only its engineering function. Arenas had little to learn from armories apart from roof treatment. Yet sponsors of armory construction made references to well-known roofed arenas, such as Madison Square Garden, and armories served as metropolitan venues of necessity for sports and entertainment promoters unable to secure dates in arenas.

Competitions occupied dedicated dimensions within the larger space. The Paterson, NJ, National Guard Armory (1894) held within it a rope net cage for use in basketball games of the first decades of the century.[39] After World War II, this armory accommodated the banked track and temporary seats for Roller Derby. Initially, promoters shared the buildings with the military. Promoters continued on after the militias' abandonments. In the 1940s and 1950s, the 69th Regiment Armory at Lexington Avenue and 25th Street in New York, fitted with temporary floor seating, accommodated basketball and Roller Derby. New York City building records for the 180,000 square foot 8th Regiment Armory in Kingsbridge, Bronx (Pilcher and Tachau, 1912), show repair work and periodic issuance of public assembly permits from the 1940s through the 1960s.[40] The District of Columbia National Guard Armory (Nathan C. Wyeth, 1940-42), with its humble low barrel vault, was built without permanent seating but received an extensive system of risers during many decades of accommodating spectacle.

The Arena in the City

The places and architecture of commercial leisure proliferated.[41] In the intense commercial market of New York City, older architectural and spatial forms changed in the face of new requirements. The tent physically stretched to accommodate both the increased scale and variety of spectacular presentation, the oval race course needed for "Roman Chariot Racing," a frequent attraction, and the third ring of the circus.[42] The long rectangle of the Roman Circus had moved inside.[43] The staked tent became fixed in position behind constructed walls and entrances. Because the interior space was enclosed but not roofed, there were no structural points from which to rig theatrical equipment. And unlike Niblo's Theatre (a catering facility and show house connected to the Metropolitan Hotel at Broadway and Prince Street) and similar places, there were no ancillary meeting rooms or restaurants.

The population of New York, attracted and held by the city's commercial strength, more than tripled between 1790 and 1820 and multiplied ten times over between 1840 and the first years of the twentieth century. In 1821 the Franconi family took over Philip Astley's Paris arenas. The promise of business brought Henri Franconi to New York. In 1853 he opened the Hippodrome (figs. 2.15-2.16), a tented brick oval marked by castellated pavilions flanking the main entrance, on the corner of Broadway and 23rd Street, near Madison Square Park in Manhattan. The park, completed by the city in 1845, was the remnant of parade ground located at the intersection of Bloomingdale Road (leading to upper Manhattan) and Eastern Post Road (leading out of the city). The parade

ground derived from the large open area between 27th and 34th Streets between Third and Seventh Avenues, blocked out in the Commissioners' Plan of 1811. In the post-Civil War period, the area was a hub of activity at the northern edge of uptown movement. Businesses began to supplant the elegant residences built in the 1840s and 1850s. Franconi's management worked to build the venue in the public imagination. A New York music publisher issued sheet music with the facility's color-lithographed image and the "blazing fresh paint" caught the attention of Henry James. Images of Franconi's appeared in *Ballou's Drawing Room Companion*.[44] Ten rows of banked seating followed the shape of the perimeter and the racecourse within. Franconi's had no proscenium stage. A writer in the *New York Herald*, commenting on the opening performance, observed a "dense mass of human beings, exceeding in number any assemblage . . . ever seen inside a building in this city, not excepting even the audiences attracted to the Jenny Lind concerts at the Castle Garden."[45]

Franconi's Hippodrome operated for only two years, though the building may have endured through 1859. It was the city's first seated interior on the oval plan, its program derived from the display potential of the staged presentation of horses in coordinated movement. As such it was the North American model for later, successively more sustainable ventures.[46] By the 1850s a public entertainment promoter desiring to establish a presence in Manhattan had to do better than pitch a large tent in a vacant lot. That approach had still worked in 1853 for General Welch's Hippodrome in Philadelphia, at Broad and Locust Streets, but not in an increasingly fashionable district in New York. The initially spare development of northerly properties within the Commissioners' Plan

of 1811 was giving way to a standard of more continuous and regular building frontage. Franconi's building perimeter accomplished more than masking an irregular tented form.[47] Franconi's walls, towers, and entrances, which enclosed beckoning tent tops, separated the street's active but indistinct environment from his show ground's focused world. The oval defined the enclosed space, as it had done in the Roman Forum and in Bulfinch's 1812-13 proposal for Harvard Yard (fig. 2.17).

Phineas T. Barnum understood the utility of a constructed perimeter as well as he did the commercial potential of the Madison Square Park neighborhood. In 1874 he suspended canvas inside the oblong boundary formed by the walls of the 23-year old former freight station of the New York and Harlem and New York and New Haven railroads at 26th Street and Madison Avenue, northeast of Madison Square Park.[48] In that year Barnum presented two rings in the space, leased from Cornelius Vanderbilt, who had removed the railroad in 1871 by combining several lines at Grand Central Terminal on 42nd Street. Barnum's Great Roman Hippodrome or Monster Classical and Geological Hippodrome was a tented facility without permanent roof structures.[49] Barnum's claims to attention were based on the attractions presented within, in contrast to the external appeal of the finished enclosure of the Crystal Palace (planned originally for Madison Square Park but located uptown on 42nd Street). Barnum and other leaseholders, including the bandleader Patrick S. Gilmore, operated the facility through 1879. Management placed a decorative pattern of lit arched forms to create a more intimate internal environment for the National Horse Show and other events.

Articles published in the architectural trade press during this period floated an alternative use of the Hippodrome site at 26th Street and Madison Avenue, one that introduced to attendees a shopping environment different from the norm, one that would by design funnel event-bound attendees through passages lined with shops: "The large mass of people visiting the concerts will find it easier and more direct to take the central

entrances, thereby converting the passages into thoroughfares to the advantage of the shopkeepers."[50] The Thomas Garden Concert Hall, designed by Alfred H. Thorp, was to be a combined event venue and shopping arcade, concert hall and 100-store retail facility (fig. 2.18). Efforts to find backing failed, though the concept of spectacular-venue retailing was powerful. The Thomas Garden plan's routing of customers through passageways lined with shops became a design norm for roofed arenas in the twentieth century, but accomplished with more sophistication in terms of actual placement of sale points.[51]

Madison Square Garden

In 1879 William K. Vanderbilt's ownership selected the new name of Madison Square Garden and increased capacity by adding one story along the Madison Avenue side.[52] *American Architect and Building News* reported its subsequent structural collapse.[53] Barnum understood the commercial limitations of tented space and moved in 1880 to replace the deteriorating venue with a versatile roofed facility. Barnum's new hippodrome would offer entertainment and education on the model of his earlier American Museum, but include an arena as well. Barnum envisioned a great exhibition venue. The proposal's size worried the city's building superintendent; Barnum's building was not constructed. In 1881, still at the leased site, he and James A. Bailey presented their combined circus in three rings.[54]

In 1887 Vanderbilt sold out to a group of National Horse Show sponsors and investors, including J. P. Morgan, Barnum, and Stanford White.[55] Two years later this

group, identifying itself as the Madison Square Garden Company, sought the public's financial participation in building an entirely new facility in the block bounded by Madison and Fourth (Park) Avenues, 26th and 27th Streets (Mc Kim, Mead & White, 1887-91, figs.2.19-2.26). The Company printed a prospectus designed to attract interest and to demonstrate management's awareness of the potential of pursuing revenue over and above what could be generated by ticket sales.[56] The Garden's site, diagonally across from Madison Square Park, might have suggested to the public that it consider the Garden as a complementary public amenity. The sponsors would not have objected to their building's appropriating civic connotation, but White (together with John Galen Howard, his assistant on the project) designed for his peers as well. The two-story building, opened in 1890, was a balustraded block of buff face brick and white unglazed terra-cotta. A tower, received by the contemporary press as "semi-Moorish, semi-Renaissance," derived from the twelfth-century minaret of the Great Mosque, Seville, supported a spotlighted copper Diana by Augustus St. Gaudens (fig. 2.19). White, interested in mining diverse historical source material, might have been aware of the sculpted maiden situated near the surviving elements of the *spina* in the hippodrome at Constantinople. That figure moved with the wind, as did St. Gaudens' Diana. A smaller-scaled Diana replaced the original in 1893.[57] White's design brought together amphitheater (12,000 capacity, 150 private boxes), theater, concert hall, ballroom, exhibition hall, roof garden, apartments, and meeting rooms in a way that placed attendees close to restaurants or catered food and allowed some spaces to serve more than

a single purpose (fig. 2.20). For example, the concert hall and restaurant could be used to feed attendees of an event in the amphitheater.

White hid his roof behind balustrades and wall surfaces intended to contrast with an armory's street presence (figs. 2.21-2.22). White included in compartmented regions surface motifs from Giovanni and Guininforte Solari's Certosa in Pavia (1429-73).[58] White wanted a finished presentation on all sides, as he noted in an August, 1889, letter to W. R. Mead: "Dear Dummy: I think it is important to keep the tower and the Madison Avenue end fully rich in Detail -- & to keep the character of the building running all around."[59] White wanted a streetscape presentation with both interest and opacity, the latter quality to impart a mystery appropriate to the building's transactional, permissioned-entrance function. He therefore encased the large, skylit amphitheater. Some relatively transparent forms could comport on the street in contexts purposed to retail selling. Other sub-volumes, such as the glass-roofed atrium within the roughly contemporaneous giant Siegel-Cooper Dry Goods Store on Sixth Avenue in New York (De Lemos and Cordes, 1896; fig. 2.27), were enveloped.

A single-story arcade, specially authorized by the state legislature, stretched around much of the building and extended its reach over the public sidewalk. White's defense of the arcade, expressed in letters to the city's buildings superintendent, characterized the feature as public shelter, though he wanted to locate retail shops there. A letter to Mead demonstrates that he also wanted the arcade to contribute to maintaining the character of the building on its several sides.[60] The arcade asserted private control over a public way by converting the sidewalk to display space for mounting posters

advertising coming attractions (fig. 2.21). As years passed, management did not hesitate to plaster the bases of the corner towers with posters. In 1894 the magazine *Billboard* began publishing to serve the bill posting industry. By 1916, trade publications were advising architects to plan surfaces for posters to prevent architectural features from being covered up.[61]

Harper's Weekly depicted the arcade as an illuminated refuge for the pre-performance and intermission gatherings of metropolitan society within the darkened city (fig. 2.28). Electric lights illuminated several features of the exotic building, highlighting White's objective to command the public's attention by multiple means. The exterior lighting established the privately-owned Garden as a dominating public destination in the city. John Sloan's *Throbbing Fountain, Night* (1908) depicted the Garden's tower as a light form, looming behind trees and figures in Madison Square Park. Newspaper reports citing the "brilliantly lit arena" increased the appeal of indoor spectatorship.[62] The Madison Avenue arcade provided a common approach to the separate entrances to theater, auditorium, and restaurant. Protected entrance and dedicated lighting was not new to spectacular venues; see, for example, Astley's Amphitheater in Surrey Road, London, of 1815 (fig. 2.29). White's Roman arcade was the Colosseum's street-level rank straightened, aligned with the sidewalk, and filled with pedestrian traffic.[63] White intended to contrast his unified sidewalk frontage with the overhanging awnings used by individual businesses in the Madison Square neighborhood and everywhere (fig. 2.30).

Owners of the succeeding Gardens expected even more financial return from the attendees' approach paths. Thomas Lamb's Garden at 49th Street and Eighth Avenue

(1925) housed an interior arcade; Charles Luckman's at 34th Street and Seventh Avenue (1968), a bi-level, interior and exterior retailing gauntlet. By 1968, arcade-inspired retailing had invaded the interior concourse surrounding the seating bowl. White's sidewalk arcade was a bold statement of persuasion.

Once inside, the focus was less clear. Attendees faced a spatial system present in the eighteenth-century opera house (fig. 2.31) and the nineteenth-century rail terminal (fig. 2.32). A head house of supportive spaces led to the main area within: in the rail terminal, a shed; in the Garden, the amphitheater. The investors conceived the entire complex as an entertainment machine, a series of spaces whose logical arrangement derived from a planned program. The scheme did not include full integration of the oval. White offered axial entrance from Madison Avenue to the amphitheater, with the theater, restaurant and concert hall on the side, but he allowed himself very little space for the concourse-like amphitheater surround on both levels. This passage was shallow, interrupted, and without designated locations of services for building or public. The balcony-level amphitheater entrance required a right-hand turn from a narrow lobby in back of the concert hall. The amphitheater's great volume controlled the dimension within the block, whose primary and secondary elements drew guests mainly according to their prior intention rather than by chance or by forced exposure. White did provide lobby access to the restaurant from a position close to the street, indicating interest in capturing the trade of non-attendee sidewalk traffic. But White did not achieve the collection of performance, service, and revenue-producing centers (including hotel and office space) created by Adler and Sullivan in their Chicago Auditorium of 1887-89, [64] or

the substantial retail opportunities encompassed within William Boyington's 1873 Grand Pacific Hotel, Chicago (fig. 2.33).

The amphitheater roof was supported by the metalwork of truss, post, and load-bearing brick. White's exposure of the open work was not an affirmation of structural expression, per Viollet-le-Duc. It was not presentation of the visual qualities of the metal, such as one found in the work of Frank Furness in the apse reading room ceiling of his contemporaneous University of Pennsylvania library (1888-91). Rather, White hoped the eye and mind would render neutral the roof support.[65] White would have wanted a finished envelope but could have achieved this only by hiding the engineering. Berlage's solution, to continue to the floor the visual line of the lower truss chord, as he did at the Amsterdam Stock Exchange (1898-1903), was not available to White due to the relatively flat arch. Instead, White tried to distinguish the balcony support posts from roof engineering. He gave them the same light value as the surrounding wall and identified the posts with the framing of each bay of ballroom balcony-like seating rather than with the trusses to which they tied (fig. 2.23) The prospectus indicated that the roof could be partially opened for summer concerts. In fact, during the design process, White wrote notes on his staff's renderings (fig. 2.24), urging them to enlarge the skylight.[66]

White's interior offered a seating bowl, three tiers of colonnaded gallery seating, and a proscenium arch and stage at the Park Avenue end (figs. 2.24-2.25). The bowl followed the outlines of Franconi's oval (figs. 2.15-2.16) and more recent seating configurations, e.g., W.W. Boyington's arrangement in his Interstate Industrial Exposition Building, Chicago (1872). Box seats were distributed along the inside

perimeter of the oval around the course the Garden referred to as the hippodrome track. These arena boxes housed many of the families prominent in New York horse circles, a group that had been pressing for a new exhibition venue.[67] White provided three additional levels of tiered boxes at the Madison Avenue end. This area of theatrical boxes was marked by vertical division of the gallery bays into seven box segments each and by distinctive treatment of the paneled rails. The emphasis given to this section produced a relationship between amphitheater end and sides comparable to that realized by Robert Adam in his 1775 renovation of the Royal Theatre, Drury Lane, the interior of which was illustrated in his *Works in Architecture* (1778-1822; fig. 1.7).[68] White's handling of the grid of column and panel established a curved facade, a kind of inverted quotation of a Colosseum rank. In this way White brought the great early example of the amphitheater within his own building, as if to claim for the Garden the successor mantle, the principal venue of its own time. White's outside oval for the Hall of Fame for Great Americans at New York University (1892-1912) was part of this formal family, as were McKim's elongated half-ovals University Hall (gymnasium, dining hall, academic theater) for Columbia University (1894-97); Harvard Stadium (1902-03; figs. 2.35-2.36), on which he collaborated; and the Harvard building's nineteenth-century predecessor, Holabird and Roche's Livestock Pavilion for the 1893 Columbian Exposition (fig. 2.37).[69]

The Garden was promoted in the press as a bold conception and valued municipal possession. Circuses used the image of the building in their advertisements. Political conventions were invited and details of its versatility celebrated.[70] Circus

attendees commented on the new pleasure of viewing the circus in aristocratic conditions, though "the small boy marked the absence of the tent."[71]

Madison Square Garden was a private venture whose sustainability depended on public interest in its entertainment programming. The facility ran at a loss for much of its existence. Within three years of its opening James A. Bailey, a tenant, sought to wrest control from the Madison Square Garden Company, charging financial mismanagement of the Garden. Bailey argued that civic pride and public duty required the maintenance of a venue "necessary for the completeness and satisfaction of life in this metropolis."[72] The *New York Times* editorialized in 1900 that the activities presented in the amphitheater of the struggling Madison Square Garden constituted a public good.[73]

Circus was consistently popular at the Garden, with Ringling assuming Barnum & Bailey's bookings in 1909. But show and prizefighting revenue, together with modest income from theater, restaurant, and meeting room rental, could not counter the Garden's operating overhead. The building was sold to a real estate concern in the early years of the twentieth century.

Business may have suffered with the opening of the Hippodrome (Frederick Thompson, 1905) uptown, near the developing theater district around Long Acre (Times) Square. The Hippodrome was not an arena but a theater with a smaller capacity than the Garden (and higher average percentage of occupancy), proscenium stage, and very large apron. These features gave the Hippodrome (whose name had nothing to do with the shape of the facility) more flexibility in show presentation.[74] The Grand Central Palace (Warren & Wetmore, Reed & Stem, 1911-12), located near Grand Central Terminal, used

its railroad access to take much of the Garden's exposition business. Partial or total demolition of the Garden, or its repurposing, was discussed as early as 1897. In 1910 and 1911 and ownership changed again, interfering with event scheduling.[75] The national movement to build memorials to the American war dead gave rise to a suggestion presented to the New York Mayor in 1919 for the erection of a convention hall and amphitheater, ultimately not built, in the block bounded by Lexington and Park Avenues and 41st and 42nd Streets. The perception that there was an unmet need was plausible, given Madison Square Garden's limited convention meeting space and increasingly marginal location.[76] In 1920 the state legislature again allowed prize fighting. The reinstatement of this draw spurred the promoter Tex Rickard to partner with John Ringling as Garden lessees. The facility generated considerable revenue in its last years prior to demolition in 1925.[77]

The Garden's physical fabric and its representation in communications media had established it as the paragon for sponsors and builders of venues in North America. There were literary dimensions, as well. Roof and tower were celebrated in Brander Matthews, *Vignettes of Manhattan* (1894). Authors sought images for use in lectures abroad.[78] The facility's name, detached from its use as a place designation, was exported to other cities and, in the case of Pittsburgh's Motor Square Garden (built as Liberty Market, Peabody & Stearns, 1900), appropriated in part. Promoters associated with other arenas measured their facilities against the Garden's, even while they avoided identifying it directly. Architects borrowed literal elements for urban public building, which resisted the economic downturn of the 1890s. William Martin Aiken (1855-1908) published

drawings in 1897 for a towered and balustraded post office and courthouse for San Francisco (fig. 2.38), skewered as a derivative melange by Willis Polk.[79] The St. Louis Coliseum Company engaged Frederick C. Bonsack to design a multi-purpose interior with a capacity of 12,000 (1906-08). The exterior reflected White's compartmentalized surface treatment using a Renaissance vocabulary (fig. 2.39). Trade publications often treated the St. Louis building and Madison Square Garden together in advertisements.[80]

In Canada, though the Edmonton Exhibition Association's stock pavilion was touted as having an arena floor "much larger than the famous ring in New York City," an arena configuration developed and matured without obvious reference to the commercial entertainment palace in New York.[81] Montreal's Westmount Arena (R. M. Rodden or Cajetan Dufort, 1898), identified in recent scholarship as the first purpose-built hockey arena.[82] began a series of pitched-roof industrial sheds that culminated in the Montreal Forum (John S. Archibald, 1924-26). The formula encased the shed within or behind a rectilinear wall through which attendees gained entrance.

Madison Square Garden's accommodation of the oval arena floor transmitted the hippodrome to the twentieth century. Spatial confusion was ended between the zones of performer or competitor and spectator. The Garden established the roofed arena in North America as a commercial enterprise by hosting events that people wanted to see and read about and by demonstrating to future arena sponsors and operators the disjuncture between the Garden's rich exterior, ancillary rooms, and passages and the prosaic structural form of the arena. The competition or show determined the sustainability, and Garden sponsors failed to support their plant with booking

consistency. The venue was a theatrical set, designed for optimum display of attendees. Arena entrepreneurs and boosters might not be able to create the Garden's exotic presentation, but they could extract the interior action envelope and ticketed event amphitheater of roof, seating bowl, and arena floor. However much one noticed the arcade, exterior surfaces, tower, Diana, restaurants, theatrical spaces, or preferred seating in the arena, the Garden's success (and the success of its descendants) depended on the contest, not the building or its features.[83] The Garden was created in a context of private privilege but operated increasingly for a broad attendee group.

This development, relevant to spectacular venues overall, resonated with the visual artist interested in issues of class. Guy Pene du Bois's 1927 painting *People* (fig. 2.40) depicted a select group both privileged and excluded, standing at the edge of a large crowd in an open stadium, possibly the Yale Bowl, which was located within traveling distance of Pene du Bois's home in Westport, Connecticut. The Yale Bowl's image appeared frequently in the New York sports press. Pene du Bois' depicted group's borderland position indicated its incipient replacement by a much larger and, for the time being, undifferentiated body of spectators. To the degree that the building's characteristics might enrich mass experience and the sponsor's pocketbook, so much the better. In fact, the twentieth century brought gradual diminution of the event and aggrandizement of the quality of attendee experience as a profit-centered objective of facility management.

Commercial Projects, Civic Appeal

The fashionable district of New York housed the famous Garden, and media reports projected its activities to the nation. But arena business was also pursued in neighborhoods very different from Madison Square. These included the country's industrial landscapes, created by decades of light manufacturing at the edges of the downtown core. In the early twentieth century the factory manufacture of ice was a visible enterprise. "Modern" ice making was marketed to the public and to restaurants and other businesses as the preferred alternative to harvested block ice. The manufacturers warned of the industrial pollution that, in their view, had made unsafe the taking of natural ice from rivers and streams. Branded freezing and preparation was best.

Such was the message of the Arena Centerfreze Company, a New Haven, CT ice manufacturing and private rink enterprise established in 1913 as a franchise of the Centerfreze process. The Centerfreze copywriters were able to convince the local society press to praise the "crystalline purity" of manufactured ice over the product of Connecticut's natural water resources and to encourage the public to come and admire the new concrete smokestack and skate on the artificial ice.[84] The Centerfreze Company's arena, a skylit, pitched-roof, balconied enclosure (fig. 2.41), was one element of the company's manufacturing complex in New Haven (Judd Engineering Company, 1913). The reproduced bird's eye view, rendered as would be the grounds of any manufacturing

plant, shows the amphitheater (with one minor public entrance) as the completing element of the triangle.

In 1897 Clarence Howard Blackall (1857-1942), a theater architect, designed a recreation and public assembly facility, with a seating capacity of 6,000, for a location just west of Massachusetts Avenue on Boylston Street in Boston. Fenway Garden (fig. 2.42) would provide an amphitheater, ballroom, roof garden, and facilities for swimming, skating and indoor bicycle riding.[85] Blackall included White's tower but doubled it, envisioning a columned front entrance framed by the two towers with a screening colonnade leading to a corner pier marking the structure's limit. The relatively narrow Massachusetts Avenue entrance provided a conduit to the ballroom and swimming area and the full oval behind, which was surrounded by a single level of seating. Blackall's client demonstrated his understanding of the importance of overall site while grappling with its specific dimensions. He wanted the frontage on Massachusetts Avenue to capture and funnel pedestrian traffic. Fenway Garden would stand at the head of the Fenway-Riverway-Jamaicaway road system, attaching itself to the system at the point Boylston Street was interrupted by the Back Bay Fens. The Garden was to offer bicycle repair to the population using this part of the Emerald Necklace. The Massachusetts Avenue location was convenient for trolley car access from Cambridge over the soon-to-open Harvard Bridge. Symphony Hall (McKim, Mead & White), at the northwest corner of Massachusetts and Huntington Avenues, had been building since 1892. Other institutions were considering relocating from downtown points. The Fenway Garden proposal rendered the roofed arena as a temple-fronted facility, one of the first instances of a mode

embraced by planners and designers in the new century. Most arrangements were to align in one direction, with entrance, lobby, and oval following the same axis. Blackall's site provided space for the oval and little else, the entrance being positioned on an axis perpendicular to that of the oval.

The Fenway Garden project remained alive for several years after the 1897 article. The enterprise was driven by the opportunity identified by the Standard Refrigerating Company to market recreational access to its artificial ice. But construction would require drummed-up advance business. William T. Richardson, Standard's president, solicited rental dates from Ringling Bros. (Ringling bought Barnum & Bailey in 1907), suggesting that the company's Buffalo Bill Wild West Show open in Boston while the circus performed at Madison Square Garden. Richardson claimed that Boston audiences would readily attend a show indoors rather than under canvas.[86] Ringling management responded favorably to the suggestion, indicating their early willingness to expand their use of indoor venues beyond New York.

Fenway Garden, however, was not built. Richardson was a principal in that effort, which was doomed by the design's lack of proportion to its relatively modest prospective uses. His role in the establishment of Boston Arena (Funk and Wilcox, Boston, 1909-10; figs. 2.43-2.45), designed and built for a different site, is unclear. Richardson may have contributed the main expertise for managing the applied technology that manufactured the ice. In any event, the arena's souvenir program listed him as Secretary and General Manager.

The Boston Arena, designated in the new century's oft-preferred manner of connecting the name of the city (i.e., not a street intersection or neighborhood) with the words "Arena" or "Auditorium," was conceived during a period of self-study on the part of the community's professional and business leaders. The analysis resulted in the identification of overarching issues that would be important for planners to consider as they chose and leveraged public works. These strategic factors included an appreciation of the importance of developing business, beautifying urban districts, improving residential housing, facilitating transportation and access to urban destinations, filling perceived gaps in the city plan, and keeping the "prosperous and educated classes" in the city.[87] These factors encouraged large-scale, even regional, thinking.

Cultural institutions were looking to move out of Boston's congested district even as the results of the city's initial rapid transit installations were being felt. The institutions needed new sites as well as enhanced exposure to residential quarters served by steam railways and streetcars, but the tight planning of Back Bay proper did not offer large plots for relocation.[88] There was space along Huntington Avenue, as it was laid out north of the Boston and Providence railroad tracks, and near its intersections with principal streets. Chief among these was Massachusetts Avenue.[89] Symphony Hall attracted the relocated headquarters of the Massachusetts Horticultural Society, in the form of a great pitched-roof shed (Wheelwright & Haven), in 1901. Other institutions followed on Huntington, including the New England Conservatory of Music (Wheelwright & Haven, 1901) and the Museum of Fine Arts (Guy Lowell, 1907-09).

The promoters of the Arena, in their advertising, cast the developing institutional center as an amusement complex. It occupied an interior parcel at the northern boundary of the South End, west of Massachusetts Avenue and east St. Botolph Street, midway between Huntington Avenue and the railroad. The evident disconnect between the perimeter of the amphitheater and rest of the facility, apparent at Madison Square Garden, was here even more strongly expressed. It was as if the entire fabric of the Garden's exterior had been transformed into a brilliantly lit sign, the Arena's twin-towered entrance marquee. The concentration of ornament at the entrance, as seen also in the first Chicago Arena at 5917 North Broadway (Carpenter & Weldon, ca. 1917), for example, was not that of Louis Sullivan's contemporaneous Midwestern banks (e.g., Merchants' National Bank, Grinnell, IA, 1914), where field and ornament constituted a whole. Instead, one felt that the intensity of attention at the arena entrances was designed to compensate for the perceived monotony of the amphitheater's exterior. Marquee and arched entrance formed a rhetoric directed against its own amphitheater. The entrance was a detached chunk of sixteenth-century Spanish cathedral architecture upon which were applied the organic, asymmetrical letterforms of Art Nouveau sensibility. Its overbearing quality indicated the lengths the designers were prepared to go in order to represent the individuality of the entering attendee against the mechanistic environment of the production shed amphitheater. The entrance was a threshold for a person. Its embellishment was intended to be understood by that person as ennobling.

The Boston Arena complex, especially the relationship between entrance and amphitheater, was not unlike what Fenway Garden might have been, but without the

columniations. The promotional booklet attempted to disguise the industrial shed that constituted the amphitheater (fig. 2.44). Walking under the marquee, the visitor entered a ticketing rotunda, then proceeded to a vestibule area whose walls displayed blind arches, actually suggested Colosseum portal outlines arranged in one plane. One of the long-dimensioned walls led to the seating bowl, which supported the truss work and pitched roof with clerestory and skylight.

The Boston Arena Company characterized its building (fig. 2.45) as the tangible result of a review of the "leading rinks in this country . . . and the famous foreign rinks." Specific buildings are not mentioned, not even Madison Square Garden.[89] This kind of claim, that the present example embodied the totality of advanced knowledge about the building type, was to become familiar in the promotional materials distributed by management of new arena operations everywhere. It was certain that sponsors needed information because they were operating without much precedent. The review team would have known about any number of facilities in Canada and the United States offering skating without seating for spectators. These plants would have provided information about the size of the skating surface relative to the recreational demands of an urban population. For example, by looking at the Aberdeen Pavilion in Ottawa (Moses C. Edey, 1898) or the State Fair Coliseum in Springfield, IL (Reeves & Baillie, 1901), or other contemporary state fair pavilions, a designer could have studied the relationship between the arena floor and perimeter. But in 1908 or 1909 attention would have been directed first to Madison Square Garden and then to one or more of the following, due to their modernity: Chicago Coliseum (Frost & Granger; E. C. and R.M. Shankland; 1897-

1900; east façade with remnants of reassembled Libby Prison Museum, 1889), St. Paul Auditorium (Reed and Stem, 1903-07; fig. 2.46), and the St. Louis Coliseum (Frederick C. Bonsack, 1908). Boston sponsors would have paid particular attention to building aspects less familiar to their architects, such as the relationship between amphitheater seating and roof structure. Madison Square Garden and the Boston Arena supported the truss arrangement with columns brought down amidst seating. There are other somewhat generic similarities. Both facilities were designed to admit daylight through skylights and windows along the walls. Reed and Stem's flexible St. Paul seating configuration enabled the building to take on both proscenium stage and arena modes and was well beyond Boston's objectives. Evidence of direct influence is difficult to establish. Not all influence would be visible or significant. It may have been more the case of the sponsors using their tour to allow them to witness progression of spaces and to visualize features that they might (or might not) want. The built result was a modest pitched-roof form, entered through a lobby/administration building and attached to an engineering space containing the artificial ice generating equipment. Building administration, engineering, and amphitheater were provided but any excess spurned, except for the florid entrance.

The Boston Arena was not part of a planned area of civic buildings. Its site did not require coordination with other structures. The arena's sponsorship did associate the facility with the other cultural institutions new to the area and make itself available to the civic improvement campaign of 1909 to 1915. In this way, the Arena, a commercial facility, established a crossover presence in the civic establishment. The same was true of Toronto's Arena Gardens (F. H. Herbert, Ross and MacFarlane, 1911-12; fig. 3.21). The

origin of Arena Gardens was entirely commercial. Yet its high walls, modest pitch, and light tone and key allowed the brick building to claim a visual association with the renaissance block and classical temple.[91] Boston progressives, led by retailer Edward A. Filene and Lincoln Steffens, featured the Boston Arena in advertising for their "Boston-1915 Civic Advance" pageant, a large exhibition intended to showcase the results of years of reform.[92] Steffens was not looking for consensus but hoped that the exhibition and discussion would develop a multiplicity of ideas for Boston's and New England's future. The arena, by its hosting exchange of views in good faith, became the incorporation of urban cooperation:

> Public gatherings and assemblages are as essential to the educational, social and political development of a modern people as they were to the civilization of old. A progressive community not only recognizes this, but provides adequate facilities for the proper housing of such gatherings.[93]

The writer for *New Boston* was referring not to the Boston Arena, but to the new building in Milwaukee, the product of a venture combining municipal and business groups. Such efforts were powered by a shared sense that schooled management of longstanding classical architectural styles produced a kind of beauty appropriate to urban settings in the new century. Recognition of this aesthetic improved urban life and helped the economy.[94] In the eyes of the business community and the municipal leadership, the industrial exposition venue of the 1880s was aging, unable to fulfill expectations. The city, they reasoned, needed a nexus of in-person interchange, performance, and display. Every large city was competing in the hospitality industry. Self-assessment in the new century resulted in the construction of 27 new civic auditoriums between 1900 and

1919.[95] The St. Paul Auditorium (Reed & Stem, 1905-07), financed in part by private subscription and independent of attachment to a larger scheme, was intended to capture convention business and accommodate a variety of spectacle. The exterior presented a brick face with ground floor arcade. Interior walls and seating flexed to provide proscenium and thrust stage arrangements and a full arena configuration (fig. 2.46). The thrust stage arrangement, with balconies extended on each side, followed the relationship between side galleries and stage present in Adler and Sullivan's Auditorium Theater (1887-89). The brick-faced, concrete and steel Milwaukee Auditorium (Ferry & Clas, 1909) replaced the city's Industrial Exposition Building (Edward Townsend Mix, 1881) and formed a nucleus for a projected civic center.[96] The architects had been responsible for the Milwaukee Public Library (1897) and Wisconsin Historical Society (1900). Their hipped-roof solution, using brick and stone trim in an emphatically non-monumental, American public school presentation was an effective mask of bulk (fig. 2.47). The program called for a multi-purpose hall (with proscenium stage at the oval's open end) for conventions, exhibitions, concerts, and circus. The oval floor and parquet seating were serviced by a narrow (12-foot) concourse lined with sale booths. The presence of a proscenium stage helped to define the interior as theatrical space, therefore requiring interior finish and hidden roof support.

Within the space of a few months, the progressive journal *New Boston* had reproduced images of the amphitheaters of the Boston Arena and the Milwaukee Auditorium in accompaniment with articles on public space and civic programs. The Boston Arena was depicted as the site of an upcoming pageant. The Milwaukee

Auditorium received treatment not only of its fabric and finish, but was identified specifically as a civic good. The reader of *New Boston* would have had to conclude that the finished Milwaukee interior, not the engineered Boston space with the exposed truss work, represented the model to be followed by progressive cities seeking to embark on an improvement plan with a roofed arena component. Framing public spaces was accomplished by encasing steel within stone or placing it behind brick and plaster. The new railroad stations in the country's larger cities, imposing in aspiration, advertised and advanced the appeal of relatively uniform compositions of masonry. Union Station in Washington, DC, Chicago Union Station; Grand Central Terminal; and Pennsylvania Station all brought the steel and glass shed inside the head house and concourses and reduced the shed to a light-admitting roof or wall element.[96] The realm of glass and visible iron or steel had been supplanted. The possibilities of open work were not of interest. The roofed arena, when vested with responsibility to make a civic impression, became a masonry and plaster product.

Formation of the Civic Group

The United States Senate Park Commission Report for Washington, DC, of 1901 (the McMillan Plan) established a framework for the inclusion of the roofed arena in the civic improvement plans of the first decade of the twentieth century. The Plan

advocated a replicable comprehensive approach that encouraged the inclusion of venues for public assembly. Such facilities were expected to be able to accommodate democratic exchange of ideas and build civic patriotism. Grouping became a unit of design and deployment. The "civic center," as the designation was used, meant a collection of administrative entities, an assemblage of performance and exhibition venues, or a combination.[98]

Glenn Brown, the national secretary of the American Institute of Architects, urged the organization to promote the shaping of public space by thinking and acting in large scale about streets and open and built land.[99] In a 1911 article for the *Builder* [100] Frederick Law Olmsted, Jr., emphasized the importance of analyzing transportation modes and pathways in order to facilitate access to places and spaces devoted to public purposes. The city planning profession's interest in automobile transportation and the grouping of public institutions was declared. In advising the planners working on Hartford, CT, in 1912, the architectural firm of Carrère & Hastings discussed the concept of "excess condemnation," whereby the municipality purchases land in excess of the footprint needs of a project, in order to protect the improvement.[101] Overall, therefore, where cities recognized the need for a roofed arena and intended to be involved in its sponsorship, that new element was likely to be part of a group of buildings or claim a substantial project parcel of its own. The scale of effect upon the land increased.

The early Cleveland Group Plan of 1903 produced clearance of land, revitalized lakefront, and an arena by 1921 and is discussed in Chapter 5. A Philadelphia proposal, not implemented, placed a huge auditorium in Fairmount Park.[102] In San

Francisco, a powerful axial group of municipal buildings (initially, Civic Auditorium [John Galen Howard, Frederick H. Meyer, John Reid, Jr., 1913-14], City Hall [Bakewell & Brown, 1915], and Public Library [George Kelham, 1916]) included the pioneer example of the arena in civic center mode, roughly contemporaneous with Henry Hornbostel and John J. Donovan's auditorium for Oakland.[103] In 1904 former Mayor James Phelan called together a group to be known as the Association for the Improvement and Adornment of San Francisco. As one outcome of the group's work, Howard, Meier, and Reid prepared the exterior of the Civic Auditorium and followed the recommendations of the Panama-Pacific International Exposition Company for the interior configuration (figs. 2.48-2.49).[104] The seating oval was truncated at one end by a proscenium stage. The Auditorium's placement and exterior presentation were useful for later site planners and civic project architects.

The Civic Auditorium occupied the equivalent of a block within a complex of buildings brought into order by a segmented rectangle of planted space aligned with the dome of City Hall. An arena's occupancy of a full city block was not remarkable: Madison Square Garden had done so. But the grand statement of the tripartite triumphal arches and columns, and their execution in stone, acquired for the arena the standing Daniel Burnham had claimed for Union Station in Washington. In compressed scale, the landscaped approach to City Hall was analogous to the World's Columbian Exposition's Grand Basin and Court of Honor or, in fact, the National Mall, as it was being realized through the McMillan Commission's work. The Mall was already a connecting field of binary relationships across its width and its length, with the United States Capitol and

Washington Monument bracketed and a second linear pair (Washington Monument and Lincoln Memorial) contemplated. In San Francisco, paired and subordinate buildings faced the City Hall dome across the green forecourt.

The San Francisco planners vested the Civic Auditorium with the responsibility of supporting a citizenship ideal by accommodating gatherings in an environment intended to inspire.[105] Armories and industrial sheds could not meet this expectation. Nor could they work in ensemble, as did the restrained but readily variegated temples of the American Renaissance.

Professional sport brought the roofed arena out of its initial phase of hosting the concentrated but occasional events of the state agricultural fair. Fair management gave the arena, located on dedicated property, the important role of hosting the indoor entertainment that would attract large numbers of visitors. Extracted from the contained landscape of fairground or the unbuilt urban lot of marginal value, the arena of sport operated on an extensive if irregular calendar and, initially, in a variety of expedient settings. Stanford White's Madison Square Garden and the Boston Arena, among other venues of established configuration, were embraced by the civic domain. The new facilities provided a base for marketing practice, with success dependent on the interest generated by the events hosted and their representation in reporting media and advertisement.

The roofed arena found a place as an element of the group of the City Beautiful.[106] Implementation of municipal projects slowed in 1917 due to general uncertainty about the international situation and lessened willingness to borrow for

capital projects.[107] However, planning continued for projects to be realized in the succeeding decade.

From a design perspective, the North American arena began as a tented and castellated enclosure in an open lot. With McKim, Mead & White's Madison Square Garden (1889-91), the arena acquired attributes antithetical to the already widespread armory building type. Implementation of stylistic variety, embedded as a possibility in Stanford White's array of towers, arcades, balustrades, and material tonalities, advanced the anti-armory. The sometimes awkward and tacked-on classicisms of the Aberdeen Pavilion (1898), especially, St. Louis Coliseum (1908), Edmonton Stock Pavilion (1910-13), Toronto Arena Gardens (1911-12), and Eastern States Exposition Coliseum, Springfield (1916) differentiated the arena from the armory's relentless battlements. Too, the dominant pitched roof was industrial in lineage but not exclusively military in application.

The sponsoring individuals, state and civic entities engaged architects who provided light, activated exteriors, versatile interior illumination, and dedicated access to a seating bowl. Their expanded balconies were clearly separate from maintenance access to the roof regions. Window shape, configuration and enframement, along with motif-rich compartmentalization of the surface, were other distinguishing features of this architecture, eclectic at the start but increasingly representative of a civic-minded classicism of stone encasement of spaces defined by steel, brick, plaster, and applied metals.

NOTES FOR CHAPTER 2

[1] Alan Metcalfe, *Canada Learns to Play: The Emergence of Organized Sport, 1807-1914* (Toronto: McClelland & Stewart, 1987), 49. For a picture of antebellum recreation, see John R. Betts, "Public Recreation, Public Parks, and Public Health Before the Civil War," in Bruce L. Bennett, ed., *Papers Presented at the Proceedings of the Big Ten Symposium on the History of Physical Education and Sport at Ohio State University, Columbus, Ohio, March 1-3, 1971* (Chicago, IL: The Athletic Institute, 1972), 33-50.

[2] Janet M. Davis, *The Circus Age: Culture and Society under the American Big Top* (Chapel Hill: University of North Carolina Press, 2002), 7.

[3] D. Stanley Eitzen and George H. Sage. *Sociology of North American Sport* (Dubuque, IA: William C. Brown, 1989), 38; Patricia McDonnell, *On the Edge of Your Seat: Popular Theater and Film in Early Twentieth-Century American Art* (New Haven, CT: Yale University Press, 2002), 10.

[4] Lary May, *Screening out the Past: The Birth of Mass Culture and the Motion Picture Industry* (Chicago, IL : University of Chicago Press, 1983), 27.

[5] Earnest Elmo Calkins and Ralph Holden, *Modern Advertising* (New York: D. Appleton, 1907), 8.

[6] "NYC 100: The First Decade," *New York Times*, Jan. 25, 1998, sec. 15, 4.

[7] For example, *National Police Gazette* (founded in 1845); *New York Clipper* (1853); Joseph Pulitzer's *New York World* (1883); and *Sporting News* (1886). See John R. Betts, "The Technological Revolution and the Rise of Sport, 1850-1900," *Mississippi Valley Historical Review* 40 (1953): 242; and Benjamin G. Rader, *American Sports: From the Age of Folk Games to the Age of Televised Sports*, 3rd ed. (Upper Saddle River, NJ: Prentice-Hall, 1996), 21.

[8] Calkins and Holden, 100; McDonnell, 19.

[9] See John R. Betts, "Sporting Journalism in Nineteenth-Century America," *American Quarterly* 5 (1953), 39-56; Betts, "Technological Revolution," Steven A. Riess, *City Games: the Evolution of American Urban Society and the Rise of Sports* (Urbana: University of Illinois Press, 1989): 203-28; *Major Problems in American Sport History: Documents and Essays* (Boston: Houghton Mifflin, 1997): 70-71.

[10] Kenneth T. Jackson, ed., *Encyclopedia of New York City* (New Haven, CT: Yale University Press, 1995), s.v. "baseball."

[11] Edward Hotaling, *They're Off!: Horse Racing at Saratoga* (Syracuse, NY: Syracuse University Press, 1995), 14.

[12] In discussion with the author on Feb. 9, 2004, bookseller and historian Robin Bledsoe noted that late nineteenth-century racetrack managers periodically waived admission fees for ladies' days, instituted other promotional gimmicks, and sometimes provided a separate gambling pavilion. Saratoga's aggressive marketing was pioneering. Hotaling's claim that it was America's first modern sports arena may be accepted if the term "arena" is defined broadly. Hotaling, 53. The racetrack (with freestanding straight ranks of seating) and the roofed arena (a closed form with enveloping seating) shared the hippodrome as antecedent.

[13] Julie A. Avery, ed*., Agricultural Fairs in America: Tradition, Education, Celebration* (East Lansing: Michigan State University, 2000), 13.

[14] Empire Expo Center and Great New York State Fair, "The New York State Fair 1841-2004," www.nysfair.org/state_fair/2004/html/history.shtml (accessed Nov. 4, 2004); American Institute of the City of New York, "Eleventh Annual Report," *Transactions of the American Institute of the City of New York* ,1852, 8, 17.

[15] *Annual Report of the New York State Agricultural Society: 1896*: 32-33.

[16] Wiley, 43.

[17] *Annual Report of the New York State Agricultural Society: 1896*: 32-33.

[18] "Preliminary Sketches, Minnesota State Fair Grounds, St. Paul, Minn.," *Western Architect* 16 (Sept. 1910): 91, pl. 25; "Architectural Possibilities of the Minnesota State Fair," *Western Architect* 18 (July 1912): 79-80.

[19] J.W. Fitsell to author, Mar. 25, 1994; "Ice Rinks," *American Architect and Building News* 1, no. 26 (June 24, 1876): 205;Metcalfe, 133-34, 145.

[20] "Origins of Hockey," Society for International Hockey Research http://www.sihrhockey.org/origins_report.cfm#montreal, accessed Aug. 19, 2005.

[21] Howard Shubert, "Sports Facilities," http://www.the canadianencyclopedia.com, accessed May 17, 2006.

[22] "A Scientific Wooden Hockey Rink," *Canadian Architect and Builder* 20, no. 230 (Feb. 1907): 20, http://digital.library.mcgill/ca/cab/search_frameset.htm, accessed Dec. 16, 2005.

[23] See "A Skating Rink / Boxing Ring, And a Wild and Crazy Façade," *New York Times*, Feb. 6, 2005, 10.

[24] Stephen Hardy, "Memory, Performance and History: The Making of American Ice Hockey at St. Paul's School, 1860-1915," *International Journal of the History of Sport* 14, no. 1 (Apr. 1997): 102; Robidoux, 44-46. One would have been able to find organized hockey played outdoors and indoors; see figs. 2.9 - 2.10.

[25] Michigan Coliseum in Calumet (1913) was one. See "Copper Country Hockey History", www.cchockeyhistory.org/CCIcerinks.htm, accessed Dec. 13, 2005.

[26] "The Largest Arched Roof Rink in America," *Canadian Architect and Builder* 9, no. 8 (Aug. 1896): 115, http://digital.library.mcgill.ca/cab/search/search_frameset.htm, accessed Aug. 1, 2003.

[27] See Springfield College, *Basketball Was Born Here* (Springfield, MA: Springfield College, 1998), 4, 5, 8.

[28] Eric Nadel, The Night Wilt Scored 100 (Dallas, TX: Taylor, 1990), 14; David S. Neft and Richard M. Cohen, *The Sports Encyclopedia: Pro Basketball, 1891-1991*, 4th ed. (New York: St. Martin's, 1991), 9.

[29] Robert W. Peterson, *Cages to Jump Shots: Pro Basketball's Early Years* (New York: Oxford University Press, 1990), 1.

[30] Advertisement, 1874, box 8, folder 3; advertisement, 1901, scrapbook 7, McCaddon Collection of the Barnum & Bailey Circus, Princeton University Library, Princeton, NJ.

[31] Bryant F. Tolles, *New Hampshire Architecture* (Hanover, NH: University Press of New England, 1979), 313.

[32] *Washington Post*, June 27, 1965, C4.

[33] *American Fistiana: Showing the Progress of Pugilism in the United States, from 1816 to 1873* (New York: Robert M. DeWitt, 1873), 17; P. Egan, *Boxiana, or Sketches of*

Antient and Modern Pugilism (London: Printed for Sherwood, Neely, and Jones, 1818), 9; H. L. Mencken, *Heathen Days* (New York: Knopf, 1943), 98.

[34] An authoritative treatment of the armory is Robert M. Fogelson, *America's Armories: Architecture, Society, and Public Order* (Cambridge: Harvard University Press, 1989. A typical floor plan is shown in fig. 2.13.

[35] *New Boston* (Oct. 1911): 190.

[36] Benjamin Wistar Morris, 1905-09; fig. 2.14.

[37] *Report of the Arsenal and Armory Commission to the General Assembly of 1907* (Hartford, CT: Connecticut Arsenal and Armory Commission, 1907), 2, 8, 16.

[38] *A Preliminary Report on the Proposed Civic Center and the City's Appearance* (Richmond, VA: City Planning Commission, 1943), pl. 4.

[39] Peterson, *Cages to Jump Shots*, 8.

[40] Herb Michelson, *A Very Simple Game: The Story of Roller Derby* (Oakland, CA: Occasional Publishing, 1971), 60; New York, Dept. of Buildings, "Building Permits Database," http://nyc.gov/html/dob/html/bis.html, accessed Dec. 19, 2003.

[41] See Benjamin C. Rader, *American Sports: From the Age of Folk Games to the Age of Televised Sports*, 3rd ed. (Upper Saddle River, NJ: Prentice-Hall, 1996), 119; Steven A. Riess, *Touching Base: Professional Baseball and American Culture in the Progressive Era* (Westport, CT: Greenwood Press, 1980), 13.

[42] Added in 1881 by James A. Bailey following his merger with Barnum. See Davis, *Circus Age*, 21.

[43] J. Guadet, *Elements and Theory of Architecture*, transl. N. Clifford Richter (Urbana, IL: n.p., 1916), 2: 335.

[44] Frederick W. Dupree, *Henry James Autobiography* (Princeton, NJ: Princeton University Press, 1983), 89.

[45] Gloria Gilda Deak, *Picturing America 1497-1899* (Princeton, NJ: Princeton University Press, 1988), 449-50.

[46] The strategy of using a castellated exterior to enclose spectacular space persisted in less charged settings, such as the Union Stock Yards Amphitheater in Denver, ca. 1910.

[47] Spatial confinement and specialization of interior space is discussed in John Bale, *Sports Geography*, 2nd ed. (New York: Routledge, 2003), 9-13.

[48] Carl W. Condit, *The Port of New York* (Chicago, IL: University of Chicago Press, 1981), 1: 27-28.

[49] Images and descriptions suggest there may have been a makeshift roof over Barnum's Hippodrome. See Miriam Berman, *Madison Square: The Park and Its Celebrated Landmarks* (Salt Lake City, UT: Gibbs-Smith, 2001), 69-70; Kurth Sprague, *The National Horse Show: A Centennial History 1883-1983* (New York: National Horse Show Foundation, 1985), n. p..

[50] *American Architect and Building News* 2, no. 78 (June 23, 1877): 197.

[51] For the arena, see ibid., 7, no. 234 (July 21, 1877): 236.

[52] Berman, 70.

[53] *American Architect and Building News* 5, no. 169 (Mar. 22, 1879): 90.

[54] See "Proposed Building to Replace Madison Square Garden," *American Architect and Building News* 7, no. 234 (June 19, 1880): 277; Richard W. Flint, "The Circus in America + Posters," *Quarterly Journal of the Library of Congress* 40, no. 3 (Summer 1983): 222.

[55] Sprague, 29.

[56] *Madison Square Garden Company Prospectus*, Y1888 Madison, Stanford White Collection, New-York Historical Society, New York, NY. See also "Madison Square Garden: An Account of the Passing of One of New York City's Architectural Landmarks," *American Architect* 128, no. 2487 (Dec. 20, 1925): 513-24.

[57] Edwin A. Grosvenor, *The Hippodrome of Constantinople and Its Still Existing Monuments* (London: Sir Joseph Causton & Sons, 1889), 11, 12; *Madison Square Garden Company Prospectus*, Y1888 Madison, Stanford White Collection, New-York Historical Society, New York, NY. "Our Tower and the Giralda," unidentified newspaper, frame 1005, reel 2072, Aline Saarinen Materials on Stanford White, Archives of American Art, New York, NY.Grosvenor, pp. 11, 12; Burke Wilkinson, *Uncommon Clay: The Life and Works of Augustus Saint Gaudens* (San Diego, CA: Harcourt, Brace, Jovanovich, 1988), 212.

[58] Leland M. Roth, *McKim, Mead & White: Architects* (London: Thames and Hudson, 1984), 161.

[59] Stanford White to W. R. Mead, Aug. 13, 1889, uncataloged drawer 35, Stanford White Collection, Avery Architectural and Fine Arts Library, Columbia University, New York, NY; Royal Cortissoz to Stanford White, Apr. 23, 1890, reel 2072, Aline Saarinen Materials on Stanford White, Archives of American Art, New York, NY.

[60] McKim, Mead & White to T. J. Brady, Superintendent of Buildings, City of New York, Dec. 3, 1889, Billy Rose Theater Division, New York Public Library for the Performing Arts, New York, NY; White to Mead, Aug. 13, 1889 (as in preceding note).

[61] Arthur Meloy, *Theatres and Motion Picture Houses: A Practical Treatise on the Proper Planning and Construction of Such Buildings* (New York: Architects' Supply & Publishing, 1916), 6.

[62] See John R. Betts, "The Technological Revolution and the Rise of Sport, 1850-1900," *Mississippi Valley Historical Review* 40 (1953): 246.

[63] The contemporaneous Cleveland Arcade (John Eisenmann and George H. Smith, 1888-90) drew consumers by enveloping a central area with passages and stores analogous to an arena's aisles and seats. See Johann Friedrich Geist, *Arcades, the History of a Building Type* (Cambridge, MA: MIT Press, 1983): 237-44.

[64] See Joseph Siry, *The Chicago Auditorium Building* (Chicago, IL: University of Chicago Press, 2002), 393.

[65] Aline Saarinen asserted that White wanted to provide a plastered ceiling below the trusswork but could not due to lack of funds. Though unsupported, Saarinen's claim is plausible given White's desire to differentiate the Garden from the rougher armory and "mechanics' hall" venues and given Garden management's practice of occasionally covering the truss system with cloth. See frame 460, reel 2073, Aline Saarinen Materials on Stanford White, Archives of American Art, New York, NY.

[66] Madison Square Garden cross section, uncataloged drawer 35, Stanford White Collection, Avery Architectural and Fine Arts Library, Columbia University, New York, NY.

[67] A comparable seating arrangement is depicted in a photograph taken in 1910 inside the Vancouver Horse Show Building; fig. 2.34.

[68] Robert Adam, *The Works in Architecture of Robert and James Adam* (1773-86, 1822;repr., London: J. Tiranti, 1931).

[69] Charles Atwood's peristyle in the Court of Honor at the World's Columbian Exposition in 1893 was in the background of subsequent designs of colonnade-bordered space. See also Barry Bergdoll, *Mastering McKim's Plan: Columbia's First Century on*

Morningside Heights (New York: Miriam and Ira D. Wallach Art Gallery, Columbia University, 1997), 42, 62-63; Richard Longstreth, *On the Edge of the World: Four Architects in San Francisco at the Turn of the Century* (New York: Architectural History Foundation, 1983), 242; Paul Venable Turner, *Campus: An American Planning Tradition* (New York: Architectural History Foundation, 1984), figs. 183, 184.

[70] "Bring Both the Big Conventions to New York!" *New York Recorder,* Nov. 9, 1891, 1, frame 1018, reel 2072, Aline Saarinen Materials on Stanford White, Archives of American Art, New York, NY. See also fig. 2.26.

[71] "The Circus in the Garden," *New York Recorder,* Mar. 28, 1891, scrapbook 8, McCaddon Collection of the Barnum & Bailey Circus, Princeton University Library, Princeton, NJ.

[72] James A. Bailey to Frank K. Sturgis, President, Madison Square Garden, Mar. 2, 1893, folder 11, box 8, Mc Caddon Collection of the Barnum & Bailey Circus, Princeton University Library, Princeton, NJ.

[73] Published in Steven A. Riess, ed., *Major Problems in American Sport History: Documents and Essays* (Boston, MA: Houghton Mifflin, 1997), 147-48.

[74] Milton Epstein, "The New York Hippodrome: Spectacle on Sixth Avenue from A Yankee Circus on Mars to Better Times, with a Complete Chronology of Performances, 1905-1939," Ph. D. diss., New York University, 1992, iii, 2, 19-21, 26. Gifford Beal's *Spotlight (At the Hippodrome)* of 1915 depicts the stage's great forward thrust.

[75] *American Architect and Building News* 99, no. 1848 (May 24, 1911): 191; A. D. Evarts to Mrs. Stanford White, Feb. 4, 1910, reel 2072, Aline Saarinen Materials on Stanford White, Archives of American Art, New York, NY; "Madison Square Garden," *Brooklyn Daily Eagle* Mar. 6, 1897, 1; "Madison Square Garden," *Brooklyn Daily Eagle* Apr. 4, 1897, 4, Brooklyn Public Library, "*Brooklyn Daily Eagle* 1841-1902," www.brooklynpubliclibrary.org/eagle/index.htm, accessed May 14, 2004; James C. Young, Madison Square Garden, to Ringling Brothers, Sept. 8, 1911, Circus and Allied Arts Collection, Special Collections, Milner Library, Illinois State University, Normal, IL.

[76] "New York Delays Action on Victory Memorial," *American Architect and Building News* 116, no. 2297 (Dec. 31, 1919): 815.

[77] Rader, 146.

[78] See 1890 letter from Richard Harding Davis, Managing Editor of *Harper's Weekly*, to Stanford White. Reel 2072, Aline Saarinen materials on Stanford White, Archives of American Art, New York, NY.

[79] Longstreth, *On the Edge,* 94.

[80] Meloy, 28.

[81] *Edmonton Daily Bulletin,* Feb. 11, 1913.

[82] Guy Pinard, *Montreal: son Histoire, son Architecture* (Montreal: La Presse, 1987), 67-74; Shubert, "Sports Facilities," http://tceplus.com/PrinterFriendly.cfm?A1ARTA0000300, accessed Apr. 7, 2006.

[83] Having taken note of the Garden's excess non-performing space, successor sponsors encased most of the avenue exposure of the next Garden (on 8th Avenue between 49th and 50th Streets) within revenue-generating retail property.

[84] W. F. Whipple, "America's Finest Arena," *Saturday Chronicle,* Feb. 7, 1914, 9; Whipple, "Modern Ice Making," *Saturday Chronicle*, Nov. 15, 1913, 6-7.

[85] *American Architect and Building News* 55, no. 1105 (Feb. 27, 1897): 71.

[86] Richardson to Ringling Brothers, Jan. 6, 1908; Ringling Brothers to Richardson, Jan. 9, 1908, Circus and Allied Arts Collection, Special Collections, Milner Library, Illinois State University, Normal, IL.

[87] Karl Haglund, *Inventing the Charles River* (Cambridge, MA: Massachusetts Institute of Technology Press, 2003), 235; Commonwealth of Massachusetts, *Public Improvements for the Metropolitan District* (Boston, MA: Wright & Potter, 1909), 1, 7, 10.

[88] Characteristically, Lewis Mumford's criticism of Boston's planners for shunting the relocating public institutions to locations he considered peripheral did not recognize the actual advantages of those locations (e.g., the corner of Massachusetts and Huntington Avenues) as transportation points. See *Back Bay Boston: The City as a Work of Art* (Boston, MA: Museum of Fine Arts, 1969), 29.

[89] See Albert Emerson Benson, *History of the Massachusetts Historical Society* (Boston, MA: Massachusetts Historical Society, 1929), 357; Alex Krieger and David Cobb, eds., *Mapping Boston* (Cambridge, MA: MIT Press, 1999), 207; Benson 357; Michael Southworth and Susan Southworth, *The Boston Society of Architects' A. I. A. Guide to Boston* (Chester, CT: Globe Pequot Press, 1987), 297.

[90] Boston Arena Company, *Boston Arena Souvenir* (Boston, MA: Benj. F. Teel, 1910), 7.

[91] See TML Fever, "Toronto Maple Leafs Fan Site," www.tmlfever.com/MUTUALSTREETARENA.html, accessed Oct. 15, 2005.

[92] James J. Connolly, *The Triumph of Ethnic Progressivism: Urban Political Culture in Boston 1900-1925* (Cambridge, MA: Harvard University Press, 1998), 39-40; Haglund, 192; *New Boston* 1, no. 6 (Oct. 1910).

[93] Joseph C. Grieb, "Milwaukee's Auditorium Building," *New Boston* 1, no. 5 (Sept. 1910): 215.

[94] The sense that visible improvements to commercial facilities would contribute to the betterment of public life was also present. See Helen Tangires, "Feeding the Cities: Public Markets and Municipal reform in the Progressive Era," *Prologue* 29, no. 1 (Spring 1997): 20.

[95] Farrell G. Symons, *Municipal Auditoriums* (Chicago, IL: Public Administration Service, 1950), 2.

[96] Grieb, 213.

[97] See Carroll L. V. Meeks, *The Railroad Station: An Architectural History* (New Haven, CT: Yale University Press, 1956), 113-34.

[98] The concept of creating new centers for public life in America appealed to Bruno Taut in his formulation for utopian communities outside the contexts of city or country. He reproduced an image of the New York Municipal Building (McKim, Mead & White, 1907-14), a center of administrative functions, as part of the discussion in his *Die Stadtkrone* of 1919.

[99] William H. Wilson, *The City Beautiful Movement* (Baltimore, MD: Johns Hopkins University Press, 1989), 93, 294, 304.

[100] Frederick Law Olmsted, Jr., "The City Beautiful," *Builder* 101 (July 7, 1911): 15-17, www.library.cornell.edu/Reps/DOCS/olmst_11.htm, accessed Dec. 19, 2005.

[101] Carrere & Hastings, *A Plan of the City of Hartford* (Hartford, CT: Case, Lockwood & Brainard, 1912), 7.

[102] In an address to the third annual conference of city planners in 1911, Frank Miles Day allowed that parks could host such building projects if site characteristics favored auditorium construction above other uses. "Parks as Building Sites," *American Architect* 99, pt. 2, no. 1850 (June 7, 1911): 201-5.

[103] "Auditorium for the City of Oakland," *American Architect* 102, no. 1906 (July 3, 1912): 13.

[104] Steven Warshaw, *The City of Gold: The Story of City Planning in San Francisco* (San Francisco, CA: Crown Zellerbach, 1960), 15, 17; Sally Byrne Woodbridge, *John Galen Howard and the University of California: The Design of a Great Public University Campus* (Berkeley, CA: University of California Press, 2002), 125.

[105] The local press was moved to complain when, in its opinion, the Civic Auditorium ("erected as a noble structure . . . enjoy innocent amusements . . . discuss subjects of civic development") was used for base purposes ("we are renting our Auditorium for brutal fisticuff exhibitions"). Virtual Museum of the City of San Francisco, "Fistic Orgies at the Civic Auditorium," *San Francisco News Letter*, Sept. 2, 1916, http://www.sfmuseum.org/hist2/fights.html, accessed Dec. 20, 2005.

[106] Jon A. Peterson, *The Birth of City Planning in the United States, 1840-1917* (Baltimore, MD: Johns Hopkins University Press, 2003), 124, 143.

[107] "The Business Outlook," *American Architect* 113, no. 2193 (Jan. 2, 1918): 17-18; *Engineering News-Record* 81, no. 1 (July 4, 1918): 33, 35.

Chapter 3

DEVELOPMENT OF PRIVATE PROJECTS

1918-1945

The United States emerged from World War I without the labor or materials to support private construction. But industrial and commercial expansion, building program backlog, and freed capital brought greatly improved conditions by 1920.[1] This spurred discussion and planning for outdoor stadia and roofed arenas under both public and private sponsorship. Streams of proposed projects, designs, criticism and letters appeared in the trade press. In this new era, sports promotion drove construction of balconied arenas with large capacities. Promotion was facilitated by maturation of product offerings, especially hockey and boxing.

Public interest in prizefighting recently had been stimulated by the adoption of boxing training in army camps; social acceptability broadened the prospective audience, and official sanction followed in many states.[2] The National Hockey League, founded in 1917 in Canada, spurred construction of large arenas in Montreal, New York, Boston, Detroit, Chicago, and Toronto beginning in the mid-1920s. Franchise awards depended on the availability of big venues, often designed around the 85' x 185' ice hockey surface. Large capacity moderated ticket prices and boosted gross receipts.[3] Hockey entrepreneurs and hired players fed media reporting, which, in turn, supported

development of persistent team loyalties. Network radio in Canada and clear channel broadcasting in the United States brought games to regular listeners located well beyond the borders of a team's geographic area. Indoor hockey's dependence on artificial illumination underscored the difference between the low level of the spectators' ambient lighting and the intensity of electric light directed to the reflective surface. Recommended standards for attendee zones specified the greatest illumination in the building lobby, then a gradually lower level as one moved through foyer and concourse to the interior. The duality of the environment invited the introduction of theatrical presentations.[4] These touring shows of the late 1930s and early 1940s, notably the 1936 Ice Revue (later Follies) of Oscar Johnson and Eddie and Roy Shipstad, Arthur Wirtz's presentation of Sonja Henie, and the Ice Capades, were highly popular and attracted direct investment from arena managements.

Basketball, a force in the development of the arena component of the physical plants of educational institutions, did not generate construction of commercial or civic buildings at this time. The professional game of the 1920s and 1930s, presented across the Midwest and Northeast in a range of viewing environments, did fill some dark nights in the schedules of the large facilities. These plants had been built by entrepreneurs banking on the appeal of hockey or by municipal entities requiring multi-purpose space.[5]

Maturation of the Arena Program

The array of contractors required to erect the inter-war arena was substantial. The essential general contracting, plumbing, heating, air-conditioning, and electrical installation activities were joined by suppliers of millwork, painting and decorating, insulation of piping, miscellaneous iron work, glass and glazing, lathing and plastering, hardware, facing (usually tile), linoleum floor, terrazzo and marble, building insulation, temperature regulation, air filtration, chimney work, stone, incineration, ventilation, pump equipment, fire protection, cinder block, and the specialty refrigeration plant. One might expect many or most of these elements in any building with a large public programming purpose. The arena sponsor's challenge was to coordinate a venue's built fabric with the main activities of its revenue service: presenting events and accommodating or, to a degree, managing attendees.

The arena was not a neutral receptacle. Building elements, volumes, and all that was visible held the potential of affecting attendee movement, behavior, and the sustainability of the venue's operation. Management demanded attention by displaying graphic advertisements in their own conceptual space apart from, and part of, the event and the host structure or surface (fig. 3.1). Tenants, especially sports teams, generated mountains of promotional material intended to establish continuity of presence within the building.[6] What was the best use of the concourse, which had been a transitory space but

could provide opportunities for revenue production? The search for best practices, together with the basic need to book acts and create shows suited to their buildings, led managers to associate and exchange information under the auspices of the Association of Auditorium Managers and the Arena Managers' Association. *Billboard*, the published instrument of the entertainment industry, carried the content of the meetings to the business at large.[7] Professional basketball leagues, generally financially unstable until the late 1940s, developed out of these discussions.

The managers, having had no part in design, operated the buildings as best they could and eventually returned the benefit of experience to their successors and, indirectly, the design profession. Their regular communication and competition encouraged the development of standard practice. Priming the industry pump, materials manufacturers advertised roofing and masonry products in the architectural press, using arena installations as the media of example. The advertisements touted the materials' light weight and manipulated the photography to emphasize the impressive surface expanse of the application (fig. 3.2).

Myron Serby's *The Stadium: A Treatise on the Design of Stadiums and Their Equipment* (1930), sponsored by the steel industry and one of the first attempts to gather information about stadium design, appeared at the end of an active decade of construction and use. Overall, owners and managers wanted facilities with higher percentages of assignable, revenue-producing square footage relative to the gross amount available. Serby, recognizing the importance of generating income beyond that provided by ticket sales, advised that facilities be planned with concession placements in mind.[8]

Seating was a key element of revenue production. The seating engineer, working with the architect, attempted to fill the facility with seats arranged to afford clear view above the heads of spectators in front.[9] The sight line objective could not be achieved in all instances. The arena floor created dimensions of activity beyond the viewing field of a single position within the seating bowl. At the same time, the mutability of the witnessed competition distributed the focus of activity across multiple fields of vision depending on the situation in the game. Mid-arena position assumed pride of place over end position. Aisles conveyed attendees to their seats but also provided internal, transverse circulation paths that complemented concourses encircling the seating bowl. Analysis of fire-drill exiting affected flow design outside the bowl, leading to specification of broad ramps as a strategy to avoid scenarios experienced by persons caught in panic exiting, during which crowd-generated compressive asphyxia had caused deaths in burning theaters.[10] For a few years, the rising commercial impetus outpaced sponsors' capacity to enclose the arena's core fabric of floor, seating bowl, and circulation pathways within an exterior programmed to a mercantile, rather than manufacturing, purpose. The first arenas of the period took the form of factories to which entrance marquees were appended. This alliance of industry and commerce was uneasy for the arena sponsor, who, interested in selling (not making) a product, vested trust in the promotional power of the merchant. The envelopment of production within a larger promotional or commercial realm was a durable element of the country's core political philosophy, acknowledged by Alexander Hamilton in *Federalist* No. 35[11] and validated in contemporary life by the robust role of advertising during the Coolidge years of 1923-

29. The industrial-commercial duality was reflected in the architecture and provides an organizational principle.

Factory Mode

The stark, pitched-roof industrial volume was serviceable for the arena application, but its product was sold not by the physicality of a building but by its signed entrance. Disjuncture between entrance and main volume characterized these buildings. The Pan-Pacific Auditorium in Los Angeles (William Pereira, Walter Wurdeman, Welton Becket, 1935; figs. 3.3-3.4), a wooden barrel vault, was known principally for its streamlined entrance pylons, possibly influenced by Erich Mendelsohn's Optical Instruments Factory drawings of 1917. A Philadelphia venue at 46th and Market Streets began as the Auditorium and Ice Palace (George F. Pawling, 1920) but shortly became simply the Arena. Its unexceptional pitched-roof form did nothing to build the venue's business. Depiction of the building in print media often used only the marquee (fig. 3.5). The main characteristic of the building housing the Chicago Riding Club (Rebori, Wentworth, Dewey & McCormick, 1924; converted to Chicago Arena, 1936, fig. 3.6) was a butterfly skylight present in many industrial applications. The repeated arches of the entrance pavilion asserted a contrasting institutional face. After the first New Haven, CT, arena burned in 1924, the successor sponsor erected a factory form and screened it with a brick and concrete face in a vaguely Tudor style (R. W. Foote, 1926-27; fig. 3.7). The plant included a basement parking garage and retail space at the sidewalk level. Thirty years earlier, the block had been a residential and light industrial zone. By the end of the 1920s, the arena dominated the area with associated, patron-targeted uses.

The industrial shed's accommodation of the merchandising imperative reached its most developed stage in John S. Archibald's Forum in Montreal (1923-24; fig. 3.8). Archibald used a pitched roof to enclose central surface and seating bowl, anchoring his principal gable within a tiered, rectilinear system tied together by stone trim. At sidewalk level, the base broadened to claim full block frontage. The Forum's sidewalk exposure accommodated the most extensive program of perimeter retail until the opening of the Olympia Arena in Detroit in 1927.

The Detroit Olympia (C. Howard Crane; Elmer G. Kiehler, Ben A. Dore, Associates, 1927; addition, 1965; (figs. 3.9-3.10), sponsored by a local business syndicate and characterized by the mayor as the most important contribution to Detroit's metropolitan progress in ten years, was the final instance of the exposed, pitched-roof factory as roofed arena.[12] The strengthening commercial impulse, exemplified by Thomas Lamb's new Madison Square Garden (1925), competed with the industrial legacy. Olympia's location on Grand River Avenue, a principal radial artery and commercial avenue outside the central business district, as well as the arena's accessibility by private car and streetcar, established Olympia as one of the first venues to site in relation to the transportation preferences of its commercial market. Complementary uses were planned for the area, including a movie theater designed by the Rapp brothers, which was not built.[13] The internal system of steel roof trusses was unremarkable. The exterior revealed both the architect's acceptance of the brick shed and his determination to modify its planar walls to achieve a distinctive presentation for his client. Brick outlining, steel sash, and stone courses prevented blank expanse. The restrained exterior of red brick and

brown terra cotta contrasted with brilliant lighting of the arena floor, a differentiation of environment comparable to the prosaic entrances and fanciful interiors of Crane's contemporary movie palaces.[14]

Crane derived the design for his huge shed from the central element of the German *Rundbogenstil* church configuration of the beginning of the second quarter of the nineteenth century. Heinrich Hübsch's unbuilt project for the Church of St. Stephan in Pforzheim (ca. 1827-28; fig. 3.11) represents the formula studied by Crane and modified to suit his commercial arena program. Crane's appropriation followed a less coherent effort, the auditorium in the industrial city of Birmingham, Alabama (Thomas Lamb, 1923-24; fig. 3.12), with a principal face of piers, projecting brick courses, corbel tables and window-dotted blind arches. Crane rendered the model's multiple arches as lifting, attenuated blind forms and subordinated them to an outsized arched window. The placement of a single arched window over a marquee was a movie theater motif. This recessed light was elevated within the façade to allow the street-level retail stores, marquee, and demarcating stone course to operate visually as a base rather than a truncation. Lobbies punched through banks of stores arranged along the two principal streets. Customers accessed the stores from the exterior. The stores along Grand River Avenue occupied the oblique zone created by Crane's placement of the arena oval.

The roofed arena with production-shed lineage or *Rundbogenstil* heritage did not project the stark image of the factory zone as generally understood and depicted in trade magazines (fig. 3.13). Still, the street effect was dour. If the factory-style arena can be likened to the train shed, the commercial arena of the mid- and late-1920s was the

head house. Between the two, interior configuration of lobbies, concourse, vomitories, and seating bowl did not differ greatly. But the arena entrepreneur recognized a contextual imperative: the building should be distinctive but not disjoined. Usually, depending on its presentation to the street, sheer volume set it apart. Bombast and fantasy interiors were generally shunned. With the event the central concern, it was best for the operator to disseminate through advertisement the expectation of respectable personal gratification and embed the venue in the prevailing commercial built environment.

The displacement of the factory form in the 1920s was suggested by the exterior of the early and ungainly Border Cities Arena in Windsor, Ontario (1924; fig. 3.14), a facility that served the Detroit hockey team until the completion of Olympia Stadium across the river. The Windsor building was a stripped version of the Coliseum at the Eastern States Exposition in Springfield, MA (James H. Ritchie, Albert C. Taylor, 1916; fig. 2.4). Windsor's beige, pink, and red surface treatment of the rectilinear perimeter replaced Springfield's arched windows and portals. Arbitrary shapes suggesting windows and pilasters were built up from the surface across the long dimension. The profile of a segmented arch roof rose above a rectangular base.

The Street of Commerce and the Enterprise of Partnership: Madison Square Gardens in New York and Boston

The designation Madison Square Garden became a commercial brand in the mid-1920s. The new building in New York spawned a Boston counterpart that initially took its name. The sponsorship groups of both buildings recognized an economic formula

that invited the financial participation of complementary businesses in the creation of adjacent or shared commercial space. In New York, sponsorship reduced its acquisition costs by constructing a passage between the street and its own space through a building it did not have to own. In Boston, arena sponsorship rented from a transportation company. Sponsorship was not troubled by either the physical effacement of the arena (New York) placed deep in its lot or by the potential confusion between the coterminous rail station and arena (Boston). The force of the buildings' names, expressed on site by attached signage but also by print and broadcast media nationwide, had become greater than that asserted by their physical presence.

Boxing and circus were key attractions for Stanford White's Madison Square Garden, circus being especially important because of the nature of the commercial engagement. Repeatable shows attracted a series of large audiences whose preferences were predictable. Sponsors understood that placing the venue in the path of customers' travel patterns was desirable. During the final years of the Garden near Madison Square, real estate brokers solicited Ringling's attention to sites then opening up in the midtown theater and restaurant district. Possibilities included building over the New York Central railroad tracks on the far west side of Manhattan.[14] Tex Rickard, with Montreal entrepreneur Thomas Duggan, saw the commercial potential of marketing to the public's sports team-based loyalties. Duggan may have had a role in selecting American franchise owners for the dissemination of the Canadian game. For his part, Rickard was prepared to bring professional hockey to New York by moving an existing team.[16] Rickard would have to build a new venue.

New York's established entertainment site, the Hippodrome at Sixth Avenue and 43rd Street (Frederic Thompson, Jay H. Morgan, 1905; renovation, Thomas W. Lamb, 1923), thrust its broad stage toward the audience but could not equal the space provided by an arena floor surface amidst a seating bowl. This design limitation excluded the Hippodrome from hosting competitive team sports and discouraged its sponsorship from investing in team ownership. Sponsors of the new Garden found the midtown location they wanted, a site occupied by a failing street railway company and small commercial operators one block west of Broadway between 49th and 50th Streets.[17]

Thomas W. Lamb was a prolific architect of movie theaters during the first decades of the twentieth century. His Adamesque interiors were found on Broadway (e.g., the Rivoli, 1917, and Capital, 1919) and in Canadian houses. Later on, he became more interested in creating otherworldly atmospherics. Louis-Joseph-Theophile Decary (1882-1952) worked with Lamb on many of these projects and supervised construction of the new Madison Square Garden.[18] For the new Madison Square Garden, opened on November 28, 1925 (figs. 3.15-3.17), the architect abandoned the permeable, towered, marble exposition hall depicted in the early advertisements (fig. 3.18) in favor of a plain building whose mass turned inward and whose external reach was implemented mainly by a beckoning, illuminated marquee at the Eighth Avenue entrance. Lamb's design moved attendees from the sidewalk marquee to the concourse by way of a vestibule and corridor. The narrow connection from sidewalk to interior volume was a characteristic of city theaters, where the positioning of the auditorium within the block varied in order to take advantage of differentiation in property values. This was the case with Lamb's

Pantages Theatre, Toronto, of 1920.[19] In a theatrical environment Lamb used the passages to build the intensity of the decorative scheme. His Loew's 175th Street Theater on Broadway on the Upper West Side (1930) featured such a progression through hallways and foyers.[20] Lamb's contemporaries placed retail stores within these passages in order to gain from the directed foot traffic.

In Lamb's passage for Madison Square Garden, attendees found only the ticket office, positioned within a bronze-accented marble setting. The Garden's passage tunneled through 125 feet of built frontage on Eighth Avenue designed by H. P. Ralph. This complementary building, which completed the Garden's intentionally unfinished, eastern front, included retail exposed to the sidewalk and was credited with six stories in its certificates of occupancy.[21] It contained exhibition and office space as well as a roofed rink for public ice skating. The building's upper-story illuminated signage advertised the skating while the Eighth Avenue extruded marquee pushed to the sidewalk the Garden's own environment.

Lamb's elevation for the 49th and 50th Street sides showed a series of arches and gabled bays very similar to Fiske Kimball's treatment for the Memorial Gymnasium at the University of Virginia of 1923 (fig. 3.19), as well as Whitney Warren's later Asbury Park, NJ, Casino Arena (1930). Lamb may have needed ideas for the outside given the focus of his career interest on interior arrangements.[22] Contemporary commentary considered the hidden volume and plain exterior the reflection of a new aesthetic based on commercial calculation and freedom from "foreign-derived architectural tutelage."[23] The air-conditioned interior bowl accommodated 17,000 persons

in a steep, vertical progression of floor seating and first and second balconies. The first balcony was a select tier of boxes whose privileged position on the long dimension underscored the dominance of the arena floor by competition requiring paired goals (e.g., hockey) or centrally focused activity (e.g., boxing). The underside of the slag roof and the roof trusses were painted cream white. Concourse and foyers were finished in plaster and marble. Vestigial clerestory windows just beneath the roof survived in Lamb's appropriation of gymnasium features.[24] Lamb's plan for the public spaces between the arena and the perimeter walls changed during the design process. A rendering dated June 23, 1924, positioned retail shops on the 49th and 50th Street sides, opening only to the street.[25] A plan created during construction replaced the shops with a restaurant and administrative offices.[26] In many principal cities, arenas continued to assert volume at the sidewalk frontage. This was the case with the new buildings in Chicago and Toronto, begun at the end of the 1920s arena building boom. But the density of the Manhattan entertainment district increased the responsibility of principal street frontage to produce revenue. Relatively narrow passages led from illuminated entrances to the artificially lit volumes within. Lamb exchanged the great pile of his initial conception for an illuminated sign and expected to suffer no loss on the transaction.

Tex Rickard wanted to brand his New York building and extend the franchise across the continent. But Rickard extracted from the name only enough play to establish his corporation as a leaseholder of the Boston and Maine Railroad for arena space above the railroad's new North Station in Boston (Funk & Wilcox, Fellheimer & Wagner, Associate Architects, 1927-28; fig. 3.20). The railroad, reorganized in 1919, sought to

establish and strengthen revenue streams by improving terminal facilities near Boston's commercial district and by offering new built space for commercial purpose. The railroad's management understood its dilemma, and they tried to work out of it. Ownership had not yet begun to look to the company as a source of tax losses. The Boston and Maine was essentially at the edge of the nation's freight system in a region where manufacturing growth had slowed. Federal subsidy of highway construction was beginning. The railroad built North Station as the passenger transportation nexus of northern New England (with convenient connections to elevated railway and subway) and erected the entertainment facility between a hotel and an office building.[27] Boston Garden and North Station aligned in a perpendicular manner with the tracks approaching from the Charles River bridges. The foursquare orientation to the breadth of the terminating railroad provided an appropriate footprint for the arena situated over the waiting room. Low arches, flatter than Stanford White's at Madison Square Garden, rose over the sidewalk. Albert Kahn's Detroit News Building (1916) had demonstrated the industrial loft's capacity to accommodate commercial applications beyond production of goods.

The architects of Boston Garden were among the first to attempt to define the commercial presentation of the rectangular block venue on the street, in this case with essentially one frontage. The view of that main Causeway Street face, itself a thin layer of masonry over a steel cage, was compromised by the elevated transit structure of 1912. The architects, undeterred, focused on getting what they could from the one principal side. At several degrees of remove, surface and massing combined to form a shallowed

abstraction of the colonnade and pavilions of the public architecture of French classicism. Horace Trumbauer's Free Library of Philadelphia (1917-25) was only one of many twentieth-century iterations of the scheme in its full dimensionality. The Boston Garden's vertical strips and flattened piers, taken together as an organizing system, was a stripped derivative of Trumbauer's approach, whose antecedents included, e.g., the north side of Anges-Jacques Gabriel's Place Louis XV (1757-75) in Paris.

The Garden was not a field house, campus gymnasium, exposition hall, civic project, or resort destination. In the view of its architects, the building's participation in the downtown conversation required a rationality enlivened, to a degree, by the buff glow of patterned brick. The North Station complex exemplified the multipurpose program for railroad stations articulated to the profession in 1930 by Alfred Fellheimer, one of the North Station architects.[28] In the case of North Station, ownership derived income indirectly from the venue and directly from passengers travelling to the venue. Establishing the attraction at a location contiguous with one of its principal means of access anticipated the placement of Charles Luckman's Madison Square Garden, successor to Lamb's, forty years later atop Pennsylvania Station..

Commercial Destinations In and Near the Central District

The arena owners and sponsors of the 1920s identified a new form of support for the ongoing development of their businesses; the disseminated descriptions of the competitions that took place in their buildings brought revenue. But selling the broadcast audience access to the represented event was still supplementary to selling seats to

attendees. Within a professional sports association, smaller relative capacity meant lesser ability to support player salaries. By the late 1920s, the substantial capacities of the new facilities in Montreal, New York, Detroit, and Boston suggested to hockey team owners playing in the smaller houses in Chicago (Coliseum) and Toronto (Mutual Street Arena, fig. 3.21) that larger accommodations could help them keep pace. The entrepreneurs driving the new buildings in these two cities were interested in creating destination venues without the dependencies or shared programming that had been established in New York and Boston. But the Boston Garden's formal presentation of framed, vertically subdivided, modestly embellished bays was attractive to sponsors in Chicago and Toronto. The modernity of the Boston Garden's articulated surface was a reverberation of Eliel Saarinen's 1922 competition entry for the Chicago Tribune tower. Yet the Garden's bay subdivisions included horizontals that did not reflect interior volume or scale. Their arbitrary nature contrasted with the contemporaneous Broad Street Suburban Station in Philadelphia (Graham, Anderson, Probst and White, 1924-29), where spandrels were expressive of internal function. The Boston Garden, though partially masked by the elevated transit structure, was a visible presence wholly different from the ambiguous assemblage fronting Lamb's Garden on Eighth Avenue. In terms of siting, Toronto followed Boston's downtown location, though without the conscious positioning at a transportation node. Chicago's new building followed upon Boston's built envelope but located as Detroit's, on the immediate periphery of the central district.

Maple Leaf Gardens (Ross & MacDonald, Jack Ryrie and Mackenzie Waters, Associate Architects, 1931; fig. 3.22) was the product of the Toronto hockey

team owner's intention to provide additional capacity for a paying audience whose loyalty was firm. Conn Smythe situated his building in the commercial district on land acquired in a friendly purchase from Eaton's Department Store. The principal design firm, responsible also for Union Station (1914-27) and the Royal York Hotel (1929), differentiated the Toronto building from its Montreal counterpart by building upon a box form a rectangular, domed and hipped roof and wrapping the still-classicizing exterior in an arrangement of banding and trim in brick, stone, and metal. Insets and stone spandrels complemented the program of vertical window strips rising from the sidewalk marquee.[29] These elements in combination achieved a generalized commercial elegance thought appropriate for a public-use building in a commercial setting. Marquee and window units emerged from the surface plane to form a decorative system that projected a contemporary look. Inside, the bowl and floor were of standard configuration. However, the dome elevated from each element of the perimeter in a gradual rise, creating a very large engineered zone above the scoreboard and the main lighting. The architects' willingness to form a dome allowed them to avoid anchoring pitched-roof truss work in or near seats and back aisles.[30]

The inadequacy of the Chicago Coliseum created an opportunity for a sponsorship group to build a facility with significantly greater capacity. The Chicago Stadium (Hall Lawrence and Ratcliffe, 1929; fig. 3.23) was the commercial venture of a local dealmaker, Patrick Harmon. Harmon began acquiring parcels in the near west side, in the 1800 block of West Madison Street, about halfway between the Loop and Garfield Park. This positioning allowed Harmon's group to spend less for property acquisition yet

still claim a potentially favored location along a principal commercial street which was on the way to the western hub of the city's park system. A feature article in *Billboard* trumpeted the facility's location within two blocks of twelve public transportation routes.[31] Harmon's prospectus, used by his teams of associates assigned to cultivate Chicago businessmen, attempted to straddle the gap between private commerce and public good: "This is no mean nor ordinary commercial project, with the sole object of making money for a selected few. It is to be primarily civic in its aspects, though, of course, profitable to its stockholders." The promoters asserted that the project was among the first improvements contemplated for the west side and touted its proximity to a "big department store" in the nearby Union Park district.[32] The familiar appeal to public purpose was directed in part to the city's aldermen because the building's scale and bulk required an alteration to the existing building code. In later years the city waived the relatively small annual license fee, preferring to gain from management's willingness to make the building available for city-sponsored events.[33]

The promotional literature made the almost obligatory Madison Square Garden comparison, but Chicago Stadium differed from Lamb's building in presentation. The Stadium was a great masonry mass without any ancillary commercial space, designed by Eric Hall, a local designer, who had produced in 1927 the Cook County Criminal Court House and Jail. It is possible that the tan brick facing on the east and west sides (limestone faces the north and south) was specified in anticipation of future provision of complementary space. The exterior, with piers and cast stone panels, was fully visible. Hall placed a pitched roof shed inside a classicizing perimeter. This

conventional approach was used in the same year by James R. Law in his proposal for a civic auditorium for Madison, WI.

Hall's treatment of surface was designed to both efface and enhance the monumentality of the volume. He aimed to achieve what the public would think of as a modern Greek temple. Hall used the corner piers and warehouse massing of Cass Gilbert's United States Army Supply Base in Brooklyn, New York (1918-19) to make the roof less apparent. The vertical articulation of the West Madison Street frontage provided a hint of the contemporary Chicago work of Holabird and Root, for example, but joined here with panels in the relationship established by Perret on the façade of the Theatre des Champs-Elyses in Paris (1913-14) The interior of Chicago Stadium offered vestibules and foyers of colored marble, a narrow concourse, and reinforced concrete seating bowl with first and second balconies.

The building envelope adopted by private arena sponsors such as Conn Smythe and Paddy Harmon was a comfortable appropriation that brought the arena form into line with most other contemporary buildings in the downtown setting. The exterior formula of classicizing insets and extrusions produced buildings that sought to belong and complement.

Materials for New Building Envelopes

Private sector arena construction in the 1930s did not sustain the level of the previous decade. Building for industry had lost some of its distinctive qualities of shape and material and began to acquire flush glass and steel surfaces. For example, the Glenn L. Martin Company Assembly Building north of Baltimore (Office of Albert Kahn, 1937; fig. 3.24) housed production activity but presented a sleek face capable of accommodating a range of interior functions, whether industrial, commercial or institutional. The taut, banded exteriors of Jack Coia's unexecuted arena in Lanarkshire, Scotland (ca. 1937), or Warner and Mitchell's Cleveland Arena on Euclid Avenue (Warner and Mitchell, 1937; fig. 3.25) formed comparable enclosures. In Cleveland, a local sports promoter and industrialist built both the arena and a manufacturing plant within the same block, distinguishable only by the arena's stone entrance panels.

One series of industry-based building production was notable because it employed concrete in a new way, expressed its plastic qualities, and used its tensile and compressive strength. In the era of its introduction, around the turn of the century, reinforced concrete would have been found in industrial applications. Later, in times of uncertain steel supply and concerns about initial cost, concrete attracted attention. In the 1930s, the material became both medium and structure for the arena of industrial heritage but commercial emphasis. The envelope formed by worked surfaces appealed to a Modern sensibility grounded in classical forms. The strategically reinforced shell, thinned

to obviate the problem of concrete's inherent dead weight, spanned long distances across building volumes.[34]

Concrete appeared in supporting arches and walls before it became a roof medium. John C. Austin used concrete arches to support the banquet hall roof in his 1928 Al Malaikah Temple in Los Angeles.[35] The Earl's Court Exhibition complex in London (C. Howard Crane with Gordon Jeeves,1936-37) was a large triangle of reinforced concrete with contrasting curvilinear forms marking each entrance. Grilles, medallions, and vertical striations broke the planes. Surfaces were sculpted from the equivalent of a printer's stereotyped plate, where the form of wood (or other material) acted as the matrix, with the building surface the result of the form's impression upon it. The exterior surfaces of the auditorium in Fresno, CA (Allied Architects of Fresno, 1936) and the Field House at Swarthmore College, PA (Walter T. Karcher and Livingston Smith, with Robert E. Lamb, 1935) were in part the product of such transferred impression.

The development of thin-shell concrete as a roofing and spanning technology promised to eliminate from an arena's funding requirements the greater part of the significant steel cost, though erection of concrete was thought to be slower and more complicated.[36] In about 1935 Milton S. Hershey noticed large numbers of hockey fans unable to squeeze into his Convention Hall and Ice Palace, which had made artificial ice since 1925 or 1926 and hosted the Hershey Bears since about 1933. Hershey, understanding the regional appeal of his hockey promotion, intended to take advantage of his town's spur access to U. S. Highway 22, a major east-west route established as one of the original nationally-designated highways in 1926. He aimed to attract fans living

between Pittsburgh and Philadelphia and drain some of the business built by the Philadelphia Arena at 45th and Market Streets.

Hershey instructed Paul Witmer, his lumber company manager and builder of Hershey community structures, to obtain plans for a larger building. Through the Portland Cement Company, Witmer found Anton Tedesko, a German engineer who had worked with Carl Zeiss Company engineers Dyckerhoff and Widmann on creating internal building surfaces better receptive of projection from optical devices. In 1932 Tedesko transferred to the Roberts and Schaefer design and construction firm in Chicago, the North American licensee of the Zeiss Dywidag barrel vault, concrete shell roof.[37]

Tedesko acted as design manager and construction foreman, leading a team of relatively unskilled local laborers in building the forms and managing the pours. There was no precedent for the scale of work represented by the Hershey Arena (Roberts and Schaefer, Anton Tedesko, 1936-38; fig. 3.26), though Tedesko had worked on the shell of the American Museum of Natural History's Hayden Planetarium (Trowbridge & Livingston, 1935). The vaulted shells, a few inches thick, transferred load to the stiffening arched ribs, which were buttressed at their bases. The shells were reinforced along the lines of stress.[38] The designer gave Milton Hershey a colorful and monumental building. The interior ceiling surface was blue and lined with cork. The roof was a contributing element of monumentality. The seating bowl's steep pitch created an immersive experience for fans due to the proximity of viewing position and field of activity. The interior volume's vertical alignment created a high exterior wall and invited extensive decorative treatment of that surface with incisions and extrusions. The design

and construction team was not troubled by issues of minimal legroom or narrow paths of circulation. The building's manager oversaw a cramped facility.[39] But the Hershey Arena, predating Eero Saarinen's Kresge Auditorium at M.I.T. of 1950-55, demonstrated the applicability of reinforced concrete to long-span roof construction. Concrete's light, non-industrial tonal ground appealed to Hershey, as it did to the Philadelphia Skating Club and Humane Society, whose Ardmore rink (Roberts and Schaefer, E. Nelson Edwards, Anton Tedesko, 1938; fig. 3.27) provided seating for only 1500 persons, walls of glass block, and a low arch. Hershey's shape and light tonality were adopted in 1938 by the city of Hibbing, MN, in Erickson & Company's steel-based design for the Hibbing Memorial Building.

In Washington, DC, M. J. Uline saw the same opportunity to attract paying spectators. Uline arrived in the city from Ohio where he owned a number of ice manufacturing plants. In about 1930 he bought a company in difficulty, applied his methods and patented processes, and achieved prominence in meeting Washington's considerable summertime ice needs. Uline's ice plant was a flat-roofed, two-story brick-faced concrete building located in the industrial and warehousing district north of Union Station, on the east side of the approach tracks. Uline knew his market and coordinated actions with his own resources as well as the government's. With some personal interest in professional sports, he was, by the end of the 1930s, aware of sports' popular appeal, the lack of a roofed arena in the District of Columbia, and the possibility of avoiding roof steel by utilizing the concrete shell.

The Uline Arena (1940-41; figs. 3.28-3.29), wedged between the ice plant and the railroad, employed the Zeiss-Dywidag concrete shell vaults and appeared in national advertising paid for by the Lone Star Cement Corporation as an example of a quick-drying, form efficient application.[40] The perimeter walls enclosing the low arch carried belt courses and were chamfered at the corners. The ice plant side, rendered white with painted brick, functioned as the entrance. If Uline made little attempt to distinguish his facility from the gritty surroundings, he was concerned about the prospect of losing business to the District of Columbia National Guard Armory, whose management began in 1950 to consider booking entertainment.[41] In 1960 the Uline Arena's successor owner began using the name Washington Coliseum to identify the structure, considered a few years later to have been a "sardine box, an ancient assembly hall in the worst neighborhood in town."[42] Already by 1964, ownership chose to avoid all context by presenting in advertisements in the trade press a line cut image in full isolation. Yet Coliseum management continued to book prime acts and events until the April 1968 riots in the nearby H Street Northeast commercial corridor. The subsequent openings of the John F. Kennedy Center for the Performing Arts in 1971 and the Capitol Centre in Landover, MD, in 1973, removed the remaining entertainment programming.

The brief series initiated by Hershey represented the arena application of the thin concrete shell during the inter-war period. The entrepreneurs and association were attracted to the shell's displacement of the large initial cost of steel. The poor insulation value of the concrete did not deter them.[43] But the barrel-vaulted form could not site easily on the commercial street. Hershey floated within amusement park grounds;

Ardmore hid in the far corner of a residential community, and Uline occupied industrial property. The roof technology determined the profile of the building and limited its viability. Tedesko's proposal for an arena in New York failed.[44] The large, privately-sponsored arenas built during the inter-war period were relatively few in number but became well known. They settled on the street as singular entities or as principal attractions in clusters of smaller complementary enterprises. The private arena venue, large or small, appeared in a city when a sponsoring individual or group recognized or created the probability of regular occupancy for a term of years. Some small buildings served educational institutions without their own facilities. Population centers might provide enough audience for circus and show dates. But most such events were supplementary to the core attraction of minor or major league professional team sports competition. The six large privately sponsored arenas erected in the 1920s and 1930s accommodated the six teams of the continent's principal hockey organization. The National Hockey League sold competition between communities. The arena's floor surface, seating bowl, and upper reaches formed a container of hostility and support. Competition intensified community identification within a larger, common economic interest.

The inter-war period brought a doubling of the number of large facilities, including the first large campus examples, and a substantial increase of overall activity. There was a general concurrency of building among civic, campus, exposition, and commercial participants. Within the commercial sphere, and especially inside a subgroup defined by a professional sports league, building was spurred by business opportunity.

The designed exteriors of Boston Garden, Chicago Stadium, and Toronto Maple Leaf Gardens, particularly the vertical openings punched out of the brick or stone, attempted to transmit an internal unity of volume. The Montreal Forum and Lamb's Madison Square Garden were sited behind the visual noise of retail frontage, while the Detroit Olympia marked the last use of unadorned industrial brick for a commercial program.

Business considerations led a few entrepreneurs to the thin shell. These early customers of concrete barrel vaulting were attracted by the notoriety of operating in building envelopes quite different from the rectangular block. There was nothing new about the arch. Yet the lightness of the roof fabric rendered visible the interior surfaces. The roof became more a part of the whole, and without the necessity of installing layers of ceiling and finish. Shell concrete had a future, if not in arena applications.

NOTES FOR CHAPTER 3

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Chapter 4

PRESENCE ON THE COLLEGE AND UNIVERSITY CAMPUS 1918-1945

Municipalities and commercial interests sponsored intense arena construction during the 1920s. But the virtual disappearance of business investment and the general decline in manufacturing and construction discouraged any robust continuation of arena building by higher education institutions after the early 1930s. General arena construction would not revive until 1950, though there were brief periods of activity at the close of both of the intervening decades. In 1949 the American Society of Planning Officials published information about more than one hundred large auditoriums located in the country's population centers. Most of these buildings had the permanent seating and central performance or competition area that defined them as roofed arenas.[1]

On the other hand, there were more arenas attached to educational institutions than to any other parent entity. Most physical plants, from primary level institutions to colleges and universities, included an arena, however elemental.[2] The primary or secondary school auditorium (sometimes serving also as a gymnasium), usually connected to or placed within the school's main physical plant, occupied a significant percentage of total volume but often was not directly accessible from outside.

Where basketball commanded a high degree of community interest, as in Indiana, the high school gym was likely to be identifiable and approachable from beyond the school grounds. Overall, however, the arenas at this level (usually simple envelopes of floor, wall, ceiling and proscenium stage) served an audience whose presence within the buildings resulted from obliged participation in the physical education program or from attendance by families of students. With the audience pre-sold, there was no sense of exchange of admittance for money. Within the system of state-budgeted public education, the school arena was primarily a service facility for participants.

In contrast, the more capacious college or university gymnasium was burdened with expectation and institutional identification. Siting and design were rendered to advance institutional goals. This higher stakes game arose from the greater scale of the parent institution and its divisibility into separate but related built elements, planners' desire for congruent building style, departmental jealousies over assignment of physical space and attendant pressure on apparently unassigned space in the gymnasium, the development of intercollegiate athletics and the related need to accommodate an interested off-campus public, and the uncertain but improving position of the gymnasium in the campus hierarchy. The gym was the locus of competition between the home institution and challenging rivals. Commitment to the construction of a principal place of institutional self-identification could be an efficient investment, given the potential of financial support from alumni. The gym ranked well above the power plant and, in its singularity, became comparable in stature to recitation buildings. Accommodation of

spectators boosted its standing, though hosting participation had been the initial focus of its program.

Foundation: Nineteenth-Century Participatory Venues

In the first half of the nineteenth century, students' physical exercise had been an outdoor activity. In mid-century, the college gymnasium provided space and apparatus for participants' physical training. Yale's first facility was a gabled shed of 1859, given some Italianate detailing by the local Chauncey A. Dickerman. Later, with exercise apparatus cleared away and placed in smaller rooms upstairs or to the side, the gyms assumed some of the multipurpose character of the college's great halls and emulated, in some instances, the head-house and shed of the assembly hall and the railroad station. The arrangement became one strategy for arena builders' attempt to achieve ensemble.

Following the Civil War, the Eastern schools built memorial and commemorative facilities capable of accommodating several kinds of activities. Harvard's Memorial Hall (Ware and Van Brunt, 1866-78) and Brown's Sayles Hall (Alpheus Morse, 1881) were valued for their versatility in a period when equipment-filled gym floors dedicated to fixed program were just beginning to give way. College assembly halls had a dais and floor, though Sayles had a permanent perimeter bench affording inward view, suggesting that it accommodated activities in an arena-like central space.[3] The hall's formula of head-house and great room gained campus legitimacy by appropriating the relationship of church spire to nave. Picturesque massing and detailing

provided cover for the campus siting of large gymnasia. Harvard's Hemenway Gymnasium (Peabody & Stearns, 1878), full of extruded decoration and rich texture, provided both multi-purpose exercise space and dedicated compartments for training in particular sports.[4] Lyman Hall (Stone, Carpenter & Willson, 1891), the first gym at Brown, presented a turreted entrance.

Yale's successor building of 1890-92 (E. E. Gandolfo), the University Gymnasium, was a pitched, glass-roofed, rectangular structure concealed by stepped facades and decorated by Renaissance forms along the street. Inside, the main space provided an exercise floor and a perimeter running track on the balcony level, analogous to the nineteenth-century armory's shallow seating balcony (figs. 4.1-4.2). The interior arrangement, natural light admittance, and vertical circulation accommodation were typical. College students played basketball on the exercise floor, into which building support posts were fitted. The entire floor space constituted the area of play; only the building's walls were out-of-bounds, as in the University of New Mexico's gym, already in use for basketball by 1899.[5] Columbia University, attempting a leap forward, envisioned a combined gymnasium, dining hall, and academic theater following the composite model of Harvard's Memorial Hall. Foundation stories were built to McKim's design between 1894 and 1897.[6]

At the turn of the century, institutions offering military science programs (e.g., the University of Kentucky in Lexington and the University of Illinois in Urbana-Champaign) sometimes put physical training and basketball in the military rooms. Indeed, one model for the collegiate gymnasium was the armory configuration of head

house and drill hall, as in the 1903 gymnasium built by the sponsors of the Third Olympic Summer Games in St. Louis on the campus of Washington University (fig. 4.3). The running track persisted as a separate element in YMCA gymnasiums (e.g., Minneapolis Central YMCA Building [Long, Lamoreaux & Long, 1919; fig. 4.4]), where a few rows of pew-like seats at the corners of the track accommodated participants and observers. This track disappeared in the collegiate spectator buildings of the 1920s where the perimeter concourse sometimes served the purpose (e.g, Palestra, University of Pennsylvania [Day & Klauder, 1925-28], and the Kiphuth Exhibition Pool, Payne Whitney Gymnasium, Yale University [John Russell Pope, 1932]).

The country's older colleges and universities transferred to the twentieth century three kinds of facilities for the general assembly of campus population: chapel, hall, and gymnasium. The chapel retained its daily attendees until compulsory presence was abolished.[7] After that change, which often occurred in the inter-war period, the chapel became a venue for weekly services. The portrait-lined great hall, typically with an unraked floor and sometimes a low stage, continued to serve for dining and gathering. And managers of the college gymnasium unfastened and relocated the anchored equipment in order to provide a competition floor and at least a minimum of seating. But none of these spaces and configurations could accommodate the increased scale of spectatorship that developed on campus in the first years of the twentieth century.

Service to Campus and Public

The place of assembly preceded the spectator-based venue in the educational institution of the late nineteenth- and early twentieth-century, whether of public or private sponsorship. During the first decades of the century, municipalities constructed primary schools with gymnasium, student assembly, and theatrical and musical presentation brought together in one large room. When spectator accommodation for athletic contests became necessary, the rooms retained their multipurpose program, with the audience on the sides or, less often, seated on the stage, as in William B. Ittner's high school in Waterloo, Iowa, of the early 1920s.[8] During the year, in many communities, these simple volumes accommodated P.T.A., town meeting, and voting.

Team and recreational basketball, accepted as part of the country's educational offering, commanded substantial spectator interest by the 1920s. Usually, one area high school received students from multiple primary schools and erected a larger gym with enough permanent seats or temporary risers for several hundred spectators. In Indiana, 800 high schools competed for the basketball championship in auditoriums enveloped within school buildings or in freestanding structures, many with entrances placed at the corners of prime street intersections. The largest of the Indiana gyms of the period, in Vincennes and Muncie, approached capacity of 10,000 persons.[9] Community identification with the local high school's pursuit of glory created a generalized expectation for even bigger and better facilities on the college and university levels. Team competition witnessed by current students and local residents enabled schools to

nurture loyalty among future contributing alumni and to deliver to the surrounding population an exciting entertainment product. Private institutions of higher education, in the face of criticism, had not yet begun to cite the business generated by their sports teams as a contribution to their communities in lieu of property taxes, from which they were usually exempt. A winning sports program created for its school positive town feeling. The late nineteenth- and early twentieth-century gymnasia that may have had only casual accommodation for spectators were unable to handle the basketball crowds of the 1920s. For example, the University of Kentucky's Buell Armory was already overburdened by 1923.

Inter-war campus construction, spurred by increased enrollments and spectator interest, brought the medium-sized facility of 5,000 to 10,000-person capacity to campuses nationwide. The new arenas were joined by other buildings providing services considered essential to the modern campus. At most campuses, classroom and library space required renewal, and student housing had to be created. Institutions erected undergraduate student unions and health service facilities. Academic administrations generally valued the visual cohesion brought by coordination of volumes and surfaces. Seating bowl, floor, and long-span engineering formed the arena's volume and, with the window treatment and cladding, allowed the building to participate in the larger campus scheme. The surface articulation usually was determined by the visual agreement campus planners wanted to establish between the arena and other buildings, both built and anticipated. War recovery enabled construction of facilities on campus edges or at satellite locations. The arenas were subsumed within very large structures having their

own relation to the whole or were placed on quadrangles or less-defined points primary or secondary to the institutional heart. The campus arena, wherever placed and however clad, created value. University administrations vested the arena with responsibility for providing the increasing ranks of potential alumni donors with a site for observed competition, where institutional loyalty and continuity could be confirmed.

The seating bowl, whether curvilinear or oriented to the arena floor in straight ranks, substantial or modest, added controlling dimensions for observation and circulation at the perimeter. The bowl generated a bulk of roof and wall exceeding that of most, if not all, buildings on campus. Architects tried to break up or divert attention from the monolithic form; multiple strategies were available. For example, stylized enclosure walls terminated the curvature of arenas built from arched truss work. Side entrances could be trimmed with stone and end entrances marked by columnar pavilions. The unwanted factory heritage indicated by a large gable roof could be lessened by allowing only the peak to emerge from surrounding walls, which might bear classicizing relief sculpture. The centering form of a stepped façade could hide the gable end of an arena entrance.

Siting, Massing, Envelope

The university's provision of broadened physical education programs, together with the expanded, media-assisted reach of the spectatorship market, moved athletic facilities to edge regions, whether within the municipal grid or along radial extensions in the urban periphery. Site planning in such less constrictive environments

allowed individual buildings or building groups not only additional space but more flexibility in orientation to better suit approach and use. Decisions about the placement of open stadiums made early in the century established options for siting roofed arenas later on. The offices of municipal and campus planning favored the progression of balanced building masses placed along axes. Boston's apportionment of the Charles River lands for development recognized the interdependence of vectors connecting Cambridge with Allston and Brighton, together with the contours of the dammed river. It followed that the long dimension of the Harvard Stadium open oval (Charles McKim and George Bruno de Gersdorff, 1902-03; figs. 2.35-2.36) aligned with Cambridge's river-directed Boylston Street, known in Allston as North Harvard Street.[10] Yale's roughly concurrent, athletics-driven expansion beyond its main campus had a contrasting result that was mined repeatedly in later years. In 1881 and 1902, alumni acquired for the university acreage to the west of New Haven near West River, a meandering stream. The university built grandstands and, by 1908, was planning a large outdoor stadium.[11] In contrast with Harvard Stadium's open oval, the Yale Bowl (Donn Barber, Charles A. Ferry, 1911-14; fig. 4.5) formed an ellipse. It was set within a land parcel situated at the contact zone between several independent street grid systems. The Bowl's long axis, aligned generally with the lot's rhomboid shape, provided a wide circumferential walkway of relatively consistent dimension. A series of portals pierced the Roman shape. Later site development included the Lapham Field House (Charles Z. Klauder, 1924) and Walter Camp Gateway (John W. Cross, 1927), all placed to establish a foursquare processional way for fans arriving by streetcar from campus.

But the Bowl, the development's first built element and center of mass, brought the concept of centroid into the discussion of athletic facility site planning. At first look, the Bowl's placement might have seemed to be provocatively oblique. In fact, the ellipse was placed in the optimum position with respect to the lot. The fans approaching from neighboring streets walked around it on the way to the entrance portal appropriate for their tickets. Fifty years later, the roofed arena arrived at the urban fringe and brought parking needs with it. In the manner of the Yale Bowl treatment, but now with an added sea of automobiles, siting practice in the 1950s and 1960s aspired to maximize the centroidal factor. With this objective achieved, management streamed attendees from the lot or garage toward the destination points in and around the arena.

The University of Illinois, Champaign-Urbana, one of the original land-grant institutions created by the Morrill Act of 1862, gave close attention to the placement of its athletic and public assembly facilities in a series of plans beginning at the turn of the century. The symmetrical and axial nature of Illinois' elongated grid scheme, developed by Clarence Howard Blackall, Daniel H. Burnham, and others between 1909 and 1911, reflected the favored process. Along malls and quadrangles, the siting of a building with a substantial footprint, such as an armory or gymnasium, would generate a balancing counterpart. Blackall's auditorium of 1905 had answered the Kenney Gymnasium (N. S. Spencer) of 1901. Blackall placed the building at an important midpoint along a principal axis. During a campus consultation prior to the beginning of construction, Frederick Law Olmsted, Jr., equated the auditorium with Columbia University's Low Library in its potential to affect the surrounding environment.[12] W. C. Zimmerman's

arched-roof armory of 1915 (figs. 4.6-4.7) was placed on a site determined earlier by Burnham. The building remained unfinished for ten years, possibly owing to its edge location, with only the central hall constructed. By 1925 the state legislature appropriated funds for a new gymnasium to be located southwest of the armory as an element of a quadrangle opening on the mall. This approaching development spurred the armory's completion and integration, with classrooms and entrances erected in 1925 by James M. White, campus architect, and Charles A. Platt as associate. Platt's earnest covering of the armory's base with a tight window and entrance system recalled the lower elevation of Sir William Chambers' Somerset House (1776-86). The wrapper was evidence of Platt's recognition of a problem of scale and his confidence in the capacity of a neoclassical vocabulary to tame the outsized industrial vault. Platt's and White's new gymnasium of 1925 (fig. 4.8) distributed the revived elements across the entire face of the structure. Inside, permanent and temporary seating on three sides faced the court designed for basketball.[13] Working with comparable stylistic elements, but without the visual competition of the arched roof, Charles Collens arranged a screen across the entire skin of his Bowdoin College gymnasium (1913; fig. 4.9). The surficial wrapper was used across the country, from Fordham University's Rose Hill Gymnasium (Emile G. Perrot, 1924-25) to the University of Oregon's McArthur Court (Ellis Lawrence, 1926-27), to attempt to tie a nonconforming volume to its context. At Rose Hill, crazed stone and mortar patterns reduced the apparent bulk. McArthur's light stone exterior emphasized vertical strips of windows and engaged piers.

Platt's attempt to maintain proportion was the same effort undertaken by any designer in achieving understandable scale. It was analogous to the cabinetmaker's management of human measure in the massive bookcases of the latter half of the eighteenth century. The bookcases' broken pediments, progressively rising central sections and end finials (fig. 4.10) created scale. In a comparable strategy, the University of Michigan's Intramural Sports Building of 1928-29 (Smith, Hinchman & Grylls; fig. 4.11) used a nineteenth-century stepped façade element and projecting gable-end lip to cohere its mass, a double pitched-roof pavilion with a transverse element masked by a large arched entrance.

The arched-roof arena form was difficult to mask; examples often appeared at the campus edge. The interior could provide significant and valuable space; the exterior usually required strategies of concealment or distraction. At the end of the nineteenth century, the arched and glassed iron roof and perimeter wall of stone or brick enclosed industrial, transportation, or exhibition space. Entrance pavilions fronted these structures. London's Kensington Olympia (Henry Edward Coe, 1886; fig. 4.12), originally National Agricultural Hall, was an enduring example. George B. Post encased his Manufacturers and Liberal Arts Building (1891-93) at the World's Columbian Exposition within a system of entrance pavilions and controlled curvature at the roof levels.[14] On campus, the steam plant may have carried a blending veneer but the vent stacks revealed the truth. Campus planners erected temporary structures when they had to meet crises in teaching and housing space, for example. In fact, some of these buildings lasted far longer than originally intended.

University architects did not always provide the external pavilion at the front but used other monolith-reducing patterns of column and window. The temple front of the Nebraska Coliseum, University of Nebraska, Lincoln (1924-25) presented columns in full depth. The later William P. Cole, Jr., Student Activities Building (Cole Field House), University of Maryland, College Park (Hall, Border and Donaldson, 1955) had a projecting central section bearing abstract columnar elements. The largest athletic plants of the Midwest, such as the Hinkle Field House, Butler University (Fermor, Spencer Cannon, 1927-28; fig. 4.13) and University of Minnesota Field House (Williams Arena; C. H. Johnston, 1927-28), were arched-roof trussed structures notable not only for the dependence of their roofs *and* balconies on truss support, but also for their depiction in contemporary advertisements for roofing deck, insulation, and mortar (fig. 4.14). At Hinkle, seating accommodation allowed the architects to receive and embed the region of arch anchoring within a broad, one-story pavilion. Otherwise, the arch ruled the exterior. At the ends, vertical openings followed in their lengths the arch's rise and fall.

The pitched-roof arena, associated in the public mind with an industrial, production-shed heritage founded in the barn, was the dominant indoor arena type. It was subject to modification by means of surface and volume treatment. Campus architects used the pitched roof for gymnasium, field house, and arena applications. Frank Miles Day and Brother's Weightman Hall gymnasium for the University of Pennsylvania (1903-04; fig. 4.15), an early example, is a pitched form placed between towers. The ensemble was designed to close the open end of the firm's new outdoor stadium oval, the precursor of Day and Klauder's first Franklin Field of 1922.

In 1919 the *New York Times* reported on intercollegiate ice hockey games being held at a commercial rink on a Philadelphia street. According to the records of the American Hockey Coaches Association, organized intercollegiate ice hockey was first played in the United States in 1896 in Baltimore.[15] Colleges with hockey programs were trying to build their own facilities in order to guarantee adequate ice time. Princeton University's Hobart Baker Memorial Skating Rink (Coy and Rice, 1921-23; fig. 4.16) marked the emergence of the pitched-roof arena on a college campus. Princeton's building accommodated 2500 persons under a low roof of slate, specified to give elegance and permanence. Aisles within the seating ranks provided the only internal circulation. The architects drew attention to the roof planes but hid the gable end behind an entrance head house trimmed with Gothic details. The back of the building faced the university's steam plant.

The pitched-roof mode of long-span construction for athletics was present on most campuses by the end of the inter-war period. Steel was effective for a broad range of truss development. The structure, left visible on the inside, spanned the area required to be kept free of columns unless cantilevered balconies interposed their own vertical supports. Truss support of a pitched roof generally described a flat arch. The spanned area usually included floor, seating bowl, and the bowl's routes of circulation. Truss work, roof, and wall made up the above-ground envelope; the lower chord of the roof truss determined the arena's height clearance. The particular arrangement of the triangular elements of the truss section was generally not significant for the usable envelope, but the manner of the attachment of the truss to the floor or wall was important.

The truss pier could be extended to the floor, as it was in the Intramural Sports Building at the University of Michigan (1928-29), where spectatorship was not an issue. Or, the truss could end at a column within a steel-framed wall. The presence of a seating bowl could force awkward compromise by requiring designers to decide how many of the building's users would have to be seated behind or adjacent to a truss anchor.

The 12,000-spectator capacity Yost Field House at the University of Michigan (Smith, Hinchman & Grylls, 1923-24; fig. 4.17), one of the first large arenas to rise in the inter-war period, used the formula of a balanced series of progressively larger arched patterns (windows and blind outline forms) on the terminating face of the long dimension. The massing, surfaces, and decorative motifs derived from Lombardy and northern Germany. Yost's corner piers, face, and windowed side retrieved the tower, transept, and nave of the cathedral at Ratzeburg (ca. 1154-1220; fig. 4.18).[16] These shapes and treatments had appeared in nineteenth-century church and industrial architecture, as when H. H. Richardson finished the exterior of the gallery-enclosing south transept of Trinity Church (1872-77) with a tripartite set of arched openings.[17] Franz Heinrich Schwechten (1841-1924) applied such a set to his Schultheiss Brewery in Berlin (1887-91) and Wilhelmine castle in Poznan (1903-10). Frederick Osterling used the motif in his Westinghouse Air Brake Works (ca. 1890) in Wilmerding, PA.(fig. 4.19).[18]

Visual accord between the arena, an inherently large building, and existing or planned surroundings pleased university trustees and, in their view, facilitated campus development. If Michigan chose archaizing brick for Yost, the University of Chicago's rendering of its field house in limestone (Holabird and Root, 1925-32; fig. 4.20) indicated

a different objective. In this case, as with the Renaissance revival building at the University of Wisconsin, Madison (Arthur Peabody with Paul Cret, 1927-30), the architects intended the tonalities of the active limestone surface to establish a contemporary, yet timeless, quality.[19] At Chicago, surface movement, expression of structure, and all elements of mystery were stripped away from the Romanesque, leaving an Art Deco shed with remnant buttresses and tall arched windows. In Madison, recessed panels encompassed each window pair, yielding a series of column-like shallow projections, a Cret trait.

Michigan's Yost Field House and Intramural Sports Building served related purposes but differed in specific program. Smith, Hinchman and Grylls, architects of both buildings, produced the pitched-roof designs as described above. In other situations, the pitched-roof form was made subservient to an intentionally discordant, dominant element, as in David C. Lang's towered Memorial Gymnasium for the University of Idaho in Moscow (1927-28; fig. 4.21)

Development in Group Mode

Some university program requirements caused the large arena to be attached to complementary, smaller facilities. This increased cost but provided specialized space and anchoring of the large building. At the University of Virginia, the large pitched roof of Memorial Gymnasium (Fiske Kimball and the Architectural Commission, 1921-24; fig. 3.19) was brought to desired scale by attached subsidiary buildings and a flamboyant series of gabled dormers derived from Charles McKim's high concourse enclosure in

Pennsylvania Station (1906-10). The Architectural Commission considered the large brick and stone mass to be a useful base for future campus quadrangle development in a classical mode.[20] The multi-part structure could itself be so massive as to form for the campus a terminating wall. In such an instance the complex was likely to have been given a unifying character drawn from an overall architectural language. In the 1920s and early 1930s, Yale University, the University of Pennsylvania, and the University of California, Berkeley, built large indoor facilities for athletes and spectators, each arranged to form a line of connected units often, but not always, arranged as a central block with adjoining structures. Yale's Payne Whitney Gymnasium (John Russell Pope, 1926-32; fig. 4.22) developed from the architect's earlier campus planning work for the university. Pope had envisioned a great mass of indoor gymnasium terminating a principal axis. Pope took the building program prepared by Everett Meeks, Dean of the School of Fine Arts, together with comments from campus architect James Gamble Rogers, and built a central exercise tower flanked by two volumes identifiable as roofed arena forms, these designated for swimming and basketball.

Pope's plan was clear from the outside. Design of entrance, movement, and exit was calibrated with the rhythm of arrival and departure. Spectators moved through a dark towered entrance and past ticket windows on their way to one of the venues sited on an axis, left or right. Six smaller openings, surmounted by blind arcades and reading from the outside as barriers, provided routes for all exiting attendees. The single entrance served spectators entering individually or in small groups. Multiple exits served all. The accommodation of simultaneous events was anticipated and served by posters inserted in

metal frames near the entrances. Brilliantly illuminated exercise and competition spaces were connected by light-toned corridors. The design separated the pathways of spectators and athletes throughout. The building's introductory literature noted a resemblance to the central and flanking elements of Liverpool Cathedral (Sir Giles Gilbert Scott, 1901-24). Payne Whitney Gymnasium terminated the northwestern end of campus and dominated an extensive forecourt, where later buildings--Hall of Graduate Studies (James Gamble Rogers, 1930-32); Morse and Ezra Stiles Colleges (Eero Saarinen, 1960-62)-- revived its towering forms.[21] Built at about the same time, the brick University of Iowa Field House at Iowa City (Proudfoot, Rawson and Souers, 1926) presented the same massing of elements but reduced stone's role to framing the central block.

The University of Pennsylvania's Palestra and Sydney Emlen Hutchinson Gymnasium (Charles Z. Klauder, Day and Klauder, 1925-28; figs. 4.23-4.25) occupied a compact parcel of land shaped by the north grandstand of Franklin Field (Charles Z. Klauder, Day and Klauder, 1922, 1925) and by the curvature of existing railroad tracks. The oblong configuration of brick with stone trim provided an arena, swimming pool, and gymnasium. The 10,000-seat Palestra's central bay opened to a cleared forecourt. The contiguous pool and gymnasium occupied lesser positions to the south. The university attempted to work with the city and with the Pennsylvania Railroad to provide pedestrian and vehicular access at the back of this location on the edge of campus.[22] In a preliminary sketch (fig. 4.25) Klauder paired the Palestra with his Franklin Field, double-decked in 1925. Franklin Field had been sited to occupy permanently the open area between Weightman Hall and the railroad. In this perspective view from a position on

Walnut Street, the eastern frontage of both buildings was presented as if to bracket the pool and gymnasium. In this view, the architect used the small but recognizable stepped end of Franklin Field to complement the featured stepped end of the Palestra, the major element of the new construction. Klauder's effort to project kinship between the two buildings relied on his using the one vantage point that produced a common frontage line between the framing members of the group. From this eastern perspective, the structures read as an ensemble.[23]

Klauder designed two sets of pivoted sash on each side of the central bay, providing natural light and coordinating with the stepped façade. Here, the façade did not mask the roof but aligned with each elevation of the graduated roof structure. The progressive elevation of the façade commanded the building's irregularly-shaped front yard, as did the low entrance foyer outside its main block. Klauder used concrete quoins not to relieve the building's brick-founded industrial character (many of the university's buildings featured that aspect) but to help tie together the several elements of the project. The Palestra was an element of the closed world of the Eastern intellectual factory, just as the nearby Municipal Auditorium (Philip H. Johnson, 1930) bore the emblems of public enterprise within a neoclassical envelope. Inside the Palestra , quadrangular truss work was anchored to steel within painted and enameled brick. Following old gymnasium practice, Klauder located permanent seating only on the balcony level but expanded the depth of that level to accommodate a significant amount of seating on four sides.[24]

Klauder's work earned him a national reputation, but his influence on arena design was felt in the Philadelphia area, as well. Jake Nevin Field House, the facility at

Villanova University (1931-32; figs. 4.26-28), was designed by the institutional architect Paul Monaghan. Monaghan appropriated the Palestra's stepped façade, high arched windows on front and sides, balcony seating and floor configuration, proscenium stage, and, with some rearrangement of masses, entrance pavilion.[25] The high arched windows countered the building's rectilinear outline. Monaghan used brick to build uninterrupted surface and rhythmic series of three-dimensional patterning. The exterior surface was varied by courses of projecting brick ends and lengths. These zones were set off by soldier courses and topped with stone. Stone highlights gave scale to planes of brick. As shown in transverse section,[26] Villanova's façade, unlike the Palestra's, did not align with the profile of roof and sash but extended its own forms skyward. The bottom, tensioned truss chord dropped almost to the level of the balcony seating. Dimensions of floor and circulation areas were generally reduced, and there was no floor-level concourse, just offices. The lobby was shallow and unassuming (fig. 4.28). Even so, its design demonstrated one aspect of the Colosseum's enduring legacy. Because the student population could now be watching as well as exercising, the architect provided separation at the entrance. The lobby afforded participants immediate access to the gymnasium floor through sets of swinging doors straight ahead. In contrast, an arched passage on each side of the lobby indicated to arriving fans the appropriate route to balcony seating. In this way, Monaghan employed Rome's portal as the directing element and threshold, transforming individuals by their movements into a temporary community of spectators. Here Monaghan followed Klauder's published advice that spectator movement should not

interfere with the work that was carried out in the building.[27] In fact, Monaghan placed his design at the service of the building's function.

For some years after its construction, the Palestra provided one model for the spatial arrangement of the modern collegiate arena, often for a school's second-generation athletic building. Duke University's Card Gymnasium (Office of Horace Trumbauer, 1930), built during the first years of that university's life, soon required expansion or replacement. An amateur's sketch (fig. 4.29), possibly produced by a university administrator or trustee, associated the new indoor stadium space with Card Gym while an improbable dome rose from behind the buttressed wall. After university review of the arenas of other institutions, the Palestra form prevailed. Cameron Indoor Stadium (Office of Horace Trumbauer, possibly with Julian Abele, 1939) used the familiar stepped front but depended on a series of rigid frames for roof support. The W. S. Lee Engineering Corporation's frame system eliminated concern over vertical clearance issues brought about by truss work, thus allowing a lower roof. The principals billed the structure as the largest enclosed arena south of the Palestra.

The Palestra lineage extended through Cameron to the William Neal Reynolds Coliseum at North Carolina State University (1942-43; 1948-49), built by the Lee Corporation in consultation with Ross Shumaker, a faculty member in the school's architecture department.[28]

George W. Kelham's concrete Harmon Gymnasium for Men at the University of California, Berkeley (1931-33; figs. 4.30-4.31), later enlarged to privilege spectators over gymnasium users, placed facilities for gymnastics, fencing, boxing, and

training and offices around a basketball court. Court seating elevated a central section above the roof line of the main block, whose entrance was marked by three concave bays. Kelham's management of the volume established a monumentality in the relationships between door and window, plain and decorated surfaces, and central bays and flanking extensions. Kelham used restrained abstraction of classical form to unify the frontages and to bind the raised central block with its surround. Pilaster strips, fluted and grooved, tied together bay and corner. Art Deco bas-reliefs marked the entrances. Kelham's interest in using this formal language to create a proportional whole followed Paul Cret's comparable organizational strategy for the Folger Shakespeare Library (1928-32; fig. 4.32). Cret and Kelham used the groove's potential to create both continuity and division in order to establish facades of integrated surface, line, and opening. Architects of the period used the stripped classicism of the fluted verticals, free from any column, in a broad range of institutional contexts including, for example, in the machined metal stairwell entrances on the suburban platforms of the Thirtieth Street Station, Philadelphia (Graham, Anderson, Probst and White, 1929-30).[29]

Working with Charles H. Bebb, the Harvard and Ecole graduate Carl F. Gould canted the entrance and arranged offices and subsidiary athletic spaces around the main area of the University of Washington Clarence S. "Hec" Edmundson Pavilion (1926-27; figs. 4.33-34). As was usual in these applications, the arena's steel skeleton rested on concrete footings and was built out with common brick. Face brick and cast stone provided the external surface. Bebb and Gould, as architects for the university, planned the Pavilion as a multipurpose space. This led them to limit permanent interior

seating to the balcony level (fig.4.34). By supplying usable ground floor space beyond the actual competition area, the architects increased programmatic flexibility (as well as concourse width) without expanding greatly the size of the main building. Charles Z. Klauder created the same relationship between floor and balcony in the Palestra. The building's controlling dimension could be limited to the size of the competition floor, thus reducing the size of the building as a whole.

Bebb had asserted the primary role of the architect in a debate with Seattle engineers during the planning of the University's athletic facilities. The engineers' association, in a bid to win supervisory control over the building of the university's outdoor football stadium, resolved that architectural features were secondary to stadium structure. Bebb asserted that understanding the qualities of unity, symmetry, and proportion, and the overall relation of part to whole, was beyond the capacity of engineers. There is no evidence of such disputes around roofed arenas. The engineers may have considered the arena projects' requiring sufficient interior architectural variety as a factor in discouraging an engineer's claim to primacy.[30] Generally, the work produced by longstanding partnerships between architects and structural engineers (e.g., George Kelham and Henry J. Brunnier between 1910 and 1940), is identified as the work of the architect. In cases where the engineer deployed a new form, such as Anton Tedesko's thin-shell concrete roof for the Hershey Arena (1936-38), the engineer's name may persist in general knowledge.

The college classrooms, dining halls, laboratories and gymnasia of the late nineteenth century indicated the development of a campus life directed inward, though

living arrangements and entertainment possibilities drew students out into the community. Through the college's sponsorship of team enterprise, the activity of observed competition modulated the gym's participatory, intramural environment. This intervention and its accommodation of spectatorship provided college administrations with a new set of opportunities to generate revenue by attracting the town's presence at sports events. Yet the athletic plant was used to protect the campus from the town by establishing bastions of facilities on the campus edge. Such sites accommodated the dimensions of the large arena, usually a pitched-roof form derived from the long experience of building for industry. Architects often found a suitable presentation mode by defining the arena's entrance as the center of an arrangement of subsidiary buildings, thereby de-emphasizing the arena's depth as an external, visible attribute.

In terms of actual attendee experience in the collegiate arena, athletic departments put forth a conflicted program during the period between the wars. The concept of broad institutional development was only beginning to be understood. Administration did comprehend the importance of ticket revenue gained from alumni and from the local fan. But these folks, attendant only on game night, moved past a host of dark offices, training and weight rooms, with which they had nothing to do. The public's presence within the clustered and often contiguous elements of the collegiate athletic complex was transitory. Often, the central entrance led to the accessible basketball court while other pathways, though visible, were denied. There were few ancillary facilities for fans. If available, concession booths were included to meet a minimal expectation. The equivocal position of the outsider underscored the institution's focus on administering the

array of physical exercise opportunities for students. For the attending public, the collegiate arena provided a core experience of an observed event governed by the clocked time of competition. One arrived, sat down, watched the first half, found a water fountain, went to the bathroom, watched the second half, and left. All focused on the event occurring on the arena floor. The college and university arena retained that center of concern throughout the interwar period.

Campus arena construction served campus needs by taking care of students, faculty, staff, and, increasingly, a paying local community. However, the campus facility had to be primarily a participatory environment. Satisfying spectators but building for several levels of student participants produced equivocal design. The architects often designed to a parti of central mass and adjoining wings in order to attempt to accommodate multiple indoor team sports, recreational and intramural activities. The tripartite massing contrasted with the unified block of the commercial arena, with its one principal internal activity space.

The favored exterior materials on campus included brick (often with stone trim) and stone rubble. The commercial and civic arenas tended toward finished stone of lighter value and reflective metals. On campus, natural light was welcomed inside, usually by a limited number of windows scaled to the large volume within. Harvard's Indoor Athletic Building (Coolidge, Shepley, Bulfinch & Abbott, 1929), covered with a riot of medium-sized windows, was an awkward exception. The concourse, inportant in the commercial arena, often was omitted in favor of athletic department offices, comparable to the armory's and the civic arena's ancillary meeting rooms. Points of

business transaction were likely to be incidental in the campus facility but increasingly integral to the commercial and the civic.

The campus facility of the inter-war period still attempted to provide the big competition space while meeting the demand for recreational uses. After the war, university administrations separated the big gymnasium from its appendages.

NOTES FOR CHAPTER 4

[1] *Civic Center Planning* (Chicago, IL: American Society of Planning Officials, 1956), 10.

[2] Published monuments of the literature of physical education facility planning during this period include Isabel C. Barrows, ed., *Physical Training: A Full Report of the Papers and Discussions of the Conference Held in Boston in November, 1889* (Boston, MA: G. H. Ellis, 1890), in which Barrows argued for the inclusion of group exercise in the school curriculum. Fletcher B. Dresslar, a specialist in school hygiene, reflected public administration's interest in gymnasia in his *American Schoolhouses* (Washington, DC: GPO, 1911) and *American School Buildings* (Washington: GPO, 1925). *Physical Education Buildings* (New York: National College Physical Education Association for Men, 1923), and *A Guide for Participants in National Facilities Conference* (Chicago, IL: Athletic Institute, 1947), both published in different eras of postwar recovery and boom construction, focus on facilities planning during a time when team play began to replace exercise. The publisher of *Physical Education Buildings* collected architectural plans and made them available to the profession. *College Architecture in America and Its Part in the Development of the Campus*, by Charles Z. Klauder and Herbert C. Wise (New York: C. Scribner's Sons, 1929), treated physical education facilities planning as an important element within the larger campus scheme.

[3] Photographs in the Brown University archives show Sayles Hall with perimeter seating arranged for floor events.

[4] Bainbridge Bunting, *Harvard: An Architectural History* (Cambridge, MA: Harvard University Press, 1985), 97, fig. 73.

[5] University of New Mexico, Center for Southwest Research, www.unm.edu/~unmarchv/Buildings/the_pit.html, accessed June 19, 2004.

[6] University Hall remained a truncated structure until the demolition of most of it in 1962. See Barry Bergdoll, *Mastering McKim's Plan: Columbia's First Century on Morningside Heights* (New York: Miriam and Ira D. Wallach Art Gallery, Columbia University, 1997), 42, 62-63.

[7] George Wilson Pierson, *Yale College: An Educational History 1871-1921* (New Haven, CT: Yale University Press, 1952), 12-13.

[8] See Fletcher Bascom Dresslar, *American School Buildings* (Washington, DC: Government Printing Office, 1925), pl. 25; "Movable Bleachers for School Gymnasia and Girls' Gymnasium Dressing and Shower Booths," *American Architect* 127, no. 2465 (Feb. 11, 1925): 135-36.

[9] Donald E. Hamilton, *Hoosier Temples: A Pictorial History of Indiana's High School Basketball Gyms* (St. Louis, MO: G. Bradley, 1993), 4, 9, 20.

[10] Though connected in a visual sense to Holabird and Roche's 1893 Livestock Pavilion for the Columbian Exposition (fig. 2.37), a relationship heretofore unacknowledged, Harvard Stadium was an open-ended and abstracted legatee of the antique hippodrome. But its series of punched and essentially plain arches retrieved for the general observer the familiar ranks of the elliptical Colosseum and demonstrated their capacity to become a sign system if arrayed on a surface which was, in this case, oval. With the function of arches changed from providing passage to providing image, later designers wrapped and sheeted them around a variety of venue shapes. For the development of the Charles River lands, see Karl Haglund, *Inventing the Charles River* (Cambridge, MA: Massachusetts Institute of Technology Press, 2003), 197.

[11] See Vincent Scully, Catherine Lynn, Erik Vogt, and Paul Goldberger, *Yale in New Haven*: *Architecture and Urbanism* (New Haven, CT: Yale University, 2004), 203.

[12] Leon Deming Tilton and Thomas Edward O'Donnell, *History of the Growth and Development of the Campus of the University of Illinois* (Urbana: University of Illinois Press, 1930), 37, 40, 50, 53.

[13] Keith Morgan, *Charles A. Platt, the Artist as Architect* (New York: Architectural History Foundation, 1985), 177-83; Tilton and O'Donnell, 138, 143-44.

[14] Sarah Bradford Landau, *George B. Post, Architect: Picturesque Designer and Determined Realist* (New York: Monacelli Press, 1998), 94-96, 98.

[15] *Baltimore Sun*, Feb. 1, 1996.

[16] See *Brickwork in Italy* (Chicago, IL: American Face Brick Association, 1925).

[17] Jeffrey Karl Ochsner, *H. H. Richardson: Complete Architectural Works* (Cambridge, MA: MIT Press, 1982), 114-23.

[18] See Brian Knox, *The Architecture of Poland* (New York: Praeger, 1971), fig. 170. For Schwechten's work in Berlin and Poznan see, respectively, Peer Zietz, *Franz Heinrich Schwechten: Ein Architekt Zwischen Historismus und Moderne* (Stuttgart: Edition Axel Menges, 1999), 56-57, and Jan Gympel, Wolfgang Jurgen Streich, and Volker Wagner, *Die Kultur Brauerei im Prenzlauer Berg* (Berlin: Bebra, 2001), 47.

[19] See Robert Bruegmann, *Holabird & Roche & Holabird & Root: An Illustrated Catalogue of Works, 1880-1940* (New York: Garland, 1991), 2: 343-45.

[20] Richard Guy Wilson and Sara A. Butler, *University of Virginia* (New York: Princeton Architectural Press, 1999), 82-83.

[21] See Steven Bedford, "The Architectural Career of John Russell Pope," Ph. D. diss., Columbia University, 1994, 8, 161-69, 350-53; *Yale and Payne Whitney Gymnasium: Fifty Years, 1932-1982* (New Haven, CT: Yale Sports Information, 1982), n.p..

[22] "New Indoor Stadium Under Construction," UPR 8.51, University Archives and Records Center Information Files, University of Pennsylvania, Philadelphia, PA.

[23] For the relationship between the athletic complex and the University of Pennsylvania's Museum of Archaeology and Anthropology, see Ann Blair Brownlee, Jeffrey A. Cohen, and Shawn Evans, *University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia, Pennsylvania, Historic Structure Report* (Philadelphia, PA: Atkin, Olshin Lawson-Bell Architects, 2005), 82, 83.

[24] Klauder was attuned to the costs and revenue associated with arenas and recommended that seating capacity be adjustable based on spectator demand. Floor seating was mounted on rollers and could be pushed back beneath the permanent seating. Klauder's published treatment of campus athletic facilities was a factor in establishing the Palestra specifically as a kind of model for the roofed arena of the period. See Klauder and Wise, 232-35; "The New Gymnasium and Indoor Stadium of the University of Pennsylvania," *School and Society* 24, no. 612 (Sept.18, 1928): 359-60.

[25] See Sandra L. Tatman and Roger W. Moss, *Biographical Dictionary of Philadelphia Architects: 1700-1930* (Boston, MA: G. K. Hall, 1985), 547-48.

[26] Sheet 7, May 11, 1931, architectural drawings from the office of Paul Monaghan, Athenaeum of Philadelphia, Philadelphia, PA.

[27] Klauder and Wise, 228.

[28] For Cameron Indoor Stadium, see Duke University, http://fansonly.com/printable/schools/duke/facilities/cameron.html, accessed Aug. 11, 2004; A. C. Lee, "Seats for Nine Thousand Fans," *Engineering News-Record* (Mar. 14, 1940): 58-59. For Reynolds, see www.fansonly.com/printable/schools/ncst/facilities/reynolds.html?frame=bottom, accessed June 19, 2004.

[29] See Sally Anderson Chappell, *Architecture and Planning of Graham, Anderson, Probst, and White, 1912-1936: Transforming Tradition* (Chicago, IL: University of Chicago Press, 1992), 199-207; Paul Cret, "Ten Years of Modernism," *Architectural Forum* 59 no. 2 (Aug. 1933), 91-94; "Gymnasium for Men, University of California, Berkeley, "*Architectural Record* 76 (Aug. 1934): 97-99; Roberta Park, "For Pleasure? Or Profit or Personal Health?: College Gymnasia as Contested Terrain," in Patricia Vertinsky and John Bale, *Sites of Sport: Space, Place, Experience* (London: Routledge, 2004), 199; and Lisa B. Reitzes, "Moderately Modern: Interpreting the Architecture of the Public Works Administration, Ph. D. diss., University of Delaware, 1989, 179-211.

[30] For the engineers and Bebb, see "Shall Architect or Engineer Predominate in Stadia Design," *American Architect* 118, no. 2333 (Sept. 8, 1920): 333.

Chapter 5

ASSERTION OF PUBLIC SPONSORSHIP

1918-1945

The expectation that the civic group with arena would constitute a valuable and widely-represented urban environment was only partially realized before World War I. Afterwards, commercial arena ventures aimed at capturing the entertainment market by building individual properties, whereas the public sector sought to effect change by placing civic buildings where they wanted to transform a site. The war interruption had delayed physical expression of the aspirations given voice by the plans and discussions from the early part of the century. Egerton Swartwout, who placed his unbuilt armory for the National Mall in Washington of 1911 inside a colonnaded exterior, wrote in 1928, the year of the erection of his auditorium for Macon, GA:

> Most auditoriums are treated architecturally on the exterior, and some are extremely good, but as a rule the interior is bare and barn-like, often with unsightly roof trusses showing, visually in effect like an oblong box with some applied architectural treatment on the side walls.[1]

Swartwout would have been aware of the inter-war progress in concealing auditorium roof engineering, beginning with the Cleveland Public Auditorium (1921-22) but in stronger evidence in Philadelphia's Convention Hall (1929-31), for example. In Philadelphia and elsewhere, the finished plaster ceiling was affixed to the lower chord of

the arched truss, which, in turn, connected to vertical steel integral to the seating bowl (fig. 5.1). In his observation, Swartwout was referring to past practice, the venerable exposed-roof norm utilized by Stanford White at Madison Square Garden in 1890 and given years of twentieth-century survival by White's acceptance of it.

Civic Projects

During the inter-war period, the privately-built and managed arena was most often part of a primary or secondary business sector of retail stores, services, offices, and banks. Opportunity and economic conditions determined its siting, usually downtown. As a built entity, it shaped the urban context by gathering to itself the harvest of its management's marketing--events and contests solicited, then advertised, but to the audience unseen except through surrender of value. The business sector developed private facilities in cities small and large across the country. Each of the ten most populous cities in 1940 had a substantial commercial building. The publicly-owned facility (often termed an auditorium but usually convertible to arena configuration with main-floor seating removed), was represented in only three of those largest cities (Cleveland, Philadelphia, St. Louis) but in many more locations in cities of mid-range population. It is distinguished here from the multitude of small arena-gymnasia built during this period in municipal parks by local authorities. Those buildings had a mission to serve citizens' recreational needs and were not, on the whole, agents of the civic agenda created for the large public facility.[2] These public ventures shared with the

commercial arena the essentials of substantial physical volume and ticketed entrance process.

But the authorities charged with responsibility for municipal planning entered the postwar era with unrealized objectives, for their own profession and for the localities in question. They intended to project the arena into the future of their communities as a civic instrument. The arena would be more than a venue to be filled by transitory events. Planners thought that the arena, sponsored and constructed by a public authority, could by its siting and architectural treatment contribute to the construction of the authority's conception of the civic self. City sponsorship envisaged the arena as a citizens' meeting place, an opportunity for the community--seated in the auditorium in front of (and perhaps interacting with) speakers on the stage or conversing in secondary meeting rooms--to bond. A proscenium stage was often provided, facing the arena from one of the ends, and sometimes bi-directional in nature, serving a smaller audience space on the other side. The generally poor sight lines available from level seating on the arena floor did not deter designers from specifying the combination repeatedly throughout the period. The exterior visibility of the required above-stage fly space varied according to the roof profile and the interior's height and width, dimensions that were determined by the size of the seating bowl. The bowl also created space underneath. An arched roof tended to mask the fly space.[3]

Municipalities used proceeds from the sale of general obligation bonds together with local public and private monies and, after 1933, Public Works Administration or Works Progress Administration support to fund construction. Facility

management attempted, but usually failed, to recoup operating expenses from rental income and concessions. Management depended on commercial tenants, especially sports teams whose local following, repeated appearances, and communications media representation made them particularly valuable.[4] With the auditorium seats removed, and an arena floor revealed, audience participation was altered, not ended. Inside the arena, competition and spectacle ruled. Some held that supporting the local team increased one's identification with city or country.[5] Marketing's gradual conquering of interior surfaces was certain. Visible messages overtook the capacity of pre-set hardware and moldings to accommodate signage. Outside, a civic, sometimes memorial architecture appealed to citizenship and often patriotism. More than one hundred principal buildings, many generated by city partnerships with business, resulted from the civic auditorium movement between the wars. Municipal planners, building on reformist thought developed earlier in the century, expected the clustering of public facilities to create democratizing repositories of artistic wealth, clear out underperforming city sectors, increase the public's access to its government, and transmit laudable values. It was, for this period, irrelevant that virtually all of the arena components lost money for their municipalities.[6]

The civic auditorium-arena clustered with other buildings in the civic center to form a discrete environment. Location was key. The setting was based on formal relationships among buildings and spaces placed along and astride axes. In that configuration, the arena-auditorium paired with other municipal buildings of comparable mass. Planar surfaces and clarity of form were characteristic features of this architecture.

Expression of structure was avoided. Interior roof support, especially, often was masked by a suspended and finished ceiling.[7] Depending on context, commercial skating facilities effaced the roof steel with lath, plaster, and colored lighting. The Iceland Skating Rink at 52nd Street and Seventh Avenue, New York (C. B. Comstock, 1922-23), was an example.[8]

In cities where the civic group did not include an auditorium, a contiguous street could tie the group with an auditorium sited on that same street in order to mark an urban division or close a visual sequence. The street was rarely on a diagonal or bias relative to the civic group, nor was it created for auditorium placement. In most cases it was an existing commercial street. That connective brought the auditorium into the civic system. The purposeful placement of the auditorium was characteristic of contemporary planning--as part of a group arrangement in a dedicated area; as a point along, or at the culmination of, a directed line segment or vector (i.e., a street); or independent of a formal siting. These locational models tended to position the auditorium apart from the central business district or at its limits, where planners found relatively low property values. The municipality's leadership, often an alliance of political and business figures, chose to use the auditorium's siting to achieve what it considered to be community objectives, which could include clearance of small-scale land uses the leadership considered undesirable.[9]

Group Siting

The civic group appeared in small and large scale during the interwar period. Throughout North America in the 1920s, the Classical Revival town hall was paired and grouped with associated buildings, including small arenas and gymnasia, whose architectural form was brought into some degree of coordination (fig. 6.3). For larger urban situations, where the scale of action was greater, it was not a matter of one building influencing another along a time line. As expressed in the public documents distributed prior to implementation, all was to be made new and in harmonious architectural relationship. The planners' hubris was evident; sometimes their urge for a diagrammatic solution overcame realistic appraisal. In 1919, for the proposed Victory Square and Civic Center in Bloomington, Illinois, the local business association hired architects to drop a new post office, city hall, auditorium, arts building, and other structures into a new square carved out of a single-block widening of a principal street. Writing for the architectural press, a participant was most casual in explaining need and cost. The arena element was cited in the planning but was not built, nor was anything else; evidently the town merely wanted to enjoy the presentation of its imagined future formal orderliness in print.[10]

The arena's attachment to the group varied. In Ottawa, where a civic improvement organization formed as early as 1899, sponsors placed the brick and concrete auditorium (Richards and Abra, 1923) on the "wrong" or railroad side of the Victoria Memorial Museum (David Ewart, 1905-12), the principal counterpart to Parliament at the opposite end of Metcalfe Street. The auditorium, advertised as Ottawa's

community hall, was part of the scheme, but barely.[11] The Sam Houston Coliseum and Music Hall (Alfred C. Finn, 1935-37), a Public Works Administration project, was on the edge of the Houston civic center area created in 1927 by vote of the residents.[12] The 1935 rendering for the proposed Los Angeles Civic Convention Hall, accomplished by the theater architect Dwight Gibbs, depicted the streamlined facility and forecourt but was ambiguous about connection to the slowly developing Civic Center.

The Cleveland facility's bond with its own group was tighter but not strong enough to form a cohesive whole. The Cleveland Public Auditorium (Frederick Betz, J. Harold MacDowell, with Frank R. Walker, 1921-22; figs. 5.4-5.5) was the first roofed arena to receive featured attention in the architectural press after World War I. Popular publications identified Cleveland as a forward-looking city and praised its public sector's capacity to move ahead while private building continued to lag following the war.[13] The auditorium, funded by a bond issue passed in 1916, was the fourth building to be erected in the Cleveland Group Plan, the 1903 scheme devised by Daniel H. Burnham, John M. Carrère, and Arnold W. Brunner. Tom L. Johnson, the good-government mayor at the time of the scheme's submission, wished to move the railroad off the lakefront and tear down acres of private and commercial buildings.[14] Government and civic buildings stretching south from Lakeside Avenue, between East Sixth and Ontario Streets, were to replace the frame structures. By the time auditorium construction began, the Group Plan's authority and symmetry had been diminished by the loss of the envisioned railroad station to a location at the corner of the Public Square, where the Van Sweringen brothers were clearing land for the Terminal Tower complex.[15]

The auditorium, possibly the largest of its type in the country at the time, occupied a plot comparable to those used for the city hall and county court and for years joined those structures as the only completed Group Plan elements between St. Clair Avenue and Cleveland Stadium (Frank R. Walker, 1931) on Lake Erie. The Public Auditorium's pitched roof was enclosed by a six-story exterior of light-colored stone, carried across length and breadth by a system of arched windows and rectangular openings rearranged from the Boston Public Library (McKim, Mead & White, 1888-92). The cornice of this granite and limestone block aligned with the other elements of the complex. Its frieze inscription identified the building as an explicitly non-memorializing representation of Cleveland's potential in a time of increasing population and expectation: "A Monument Conceived as a Tribute to the Ideals of Cleveland, Builded by Her Citizens and Dedicated to Social Progress, Industrial Achievement and Civic Interest."[16]

The city expected the auditorium (fig. 5.5), configured with U-shaped seating between entrance lobby and stage, to accommodate national conventions, exhibitions, and entertainment. The multi-purpose program included theater, which mandated an internal environment with "finished" appearance. Meeting rooms and convention service areas were provided north of the arena, with theatrical space to the south. The arena stage also served the smaller theatrical space. The basement offered exhibition spaces, and runways led to the arena floor. Interior surfaces of marble, tile, and plaster established the visible envelope. The bottom chord of the roof truss, though visible, fully blended into the ceiling's glass-paneled housing of lighting reflectors and diffusers. The architects'

conversion of roof support into a decorative element of finish, notable at the time, was trumpeted by advertisers and followed by other practitioners. The ceiling arrangement in Philadelphia's Convention Hall of 1929-31 (Philip H. Johnson), was almost identical. The Cleveland arena's substantial mechanical and electrical systems, masked behind the finish, included conditioned air, central vacuum cleaning, fire protection, and back-up systems.[17] Ventilation grates, disguising the mostly unseen machine world, extruded through the wall surface where necessary.

As a rule, in the larger public buildings of the period, engineering and finish were kept separate. The passenger concourse at Union Station, Chicago (Graham, Anderson, Probst and White, 1924) was all structure; the waiting room all finish. Throughout the 1920s, especially, advertisements in *Pencil Points* advocated the use of materials and equipment intended to dignify the building exterior (e.g., limestone) and control the building interior (e.g., air handling systems). The material was made visible, the equipment remained hidden though celebrated in the trade press. The development of heating, air conditioning, electrical controls, lighting, elevator service, and acoustics--together with the value placed on a neat envelope--required new coordination and overall planning between the architect and engineering teams.[18]

Site planning for the Municipal Auditorium and Community Center Building of St. Louis (Louis La Beaume and Eugene S. Klein for The Plaza Commission, Inc., Architects and Engineers, 1926-27; 1932-38; renamed Henry W. Kiel Auditorium in 1943; figs. 5.7-5.11) began in 1915.[19] The process followed in St. Louis was distinct from that pursued in Cleveland, though groups of civic buildings were envisaged in both cities

and their arena components were related in conception. In Cleveland, Burnham and Pierce Anderson established a very large controlling dimension for the group plan, which was followed. This measure challenged the cohesion between built spaces as well as the capacity of open space to bind elements. Buildings, including the Public Auditorium, were part of the overall zone of the mall but did not orient to it. Cleveland architect Frank Cudell criticized the scale of the group plan and offered his own scheme (fig. 5.6). Here, Cudell fronted the group's parts on a common open space in order to increase street-level comprehension of the whole.[20] This was the approach actually implemented in St. Louis.

In St. Louis the comparable buildings took positions along a shared space framed on the east by City Hall (Eckel and Mann, 1896) and by Union Station (Theodore C. Link with George H. Pegram, 1912) on the west (fig. 5.7). Cass Gilbert's Central Public Library (1912) and Isaac Taylor's Municipal Courts Building (ca. 1910) provided existing reference points within the project area, whose dense irregularity already had prompted the Civic Improvement League to advocate parkway-enabling clearance. Harland Bartholomew, engineer to the City Plan Commission, believed that public building projects (including civic art-inspired auditorium components) could help eradicate unwanted areas of modest-scale business development.

Bartholomew understood from city authorities the desire to reflect in their built projects something other than the commercial spirit, though commerce was important to a building's program. Given this perspective, the arena component's inclusion in the civic group made sense. An arena was attractive because it could project a message of civic refinement yet retain at least the possibility of making money.[21]

The firm Harland Bartholomew and Associates produced several hundred plans for local urban governments between 1919 and 1970. Bartholomew's plans valued government's right to condemn and control by clearance. His approach, which included classification of streets into radial, crosstown, and residential categories, recognized the demands of automobile access. Increasingly, Bartholomew recommended widening (he used the term improvement) traffic arteries to facilitate access to city centers.[22] Bartholomew zoned St. Louis into functional sections during 1915. The new street plan, derived from that project, created an extensive clear path to the Mississippi River and a series of building frontages along the mall. Bartholomew planned to service the buildings from Clark Street, south of a widened Market Street.[23] The City Plan Commission recommended in 1918 the construction of an auditorium but funding difficulties slowed development for several years. In 1923 the St. Louis General Improvement Bond Issue passed, aided by Public Works Administration monies in the 1930s, enabling the establishment of a new configuration in the project area.[24] Local opponents feared that removal of civic buildings from the downtown commercial district (e.g., the municipal court) would damage property values there. But others argued that St. Louis was large enough to support more than one group of public buildings.[25]

The city, moving past the opposition, asked the American Institute of Architects to recommend eight architectural and engineering firms; six of these would constitute the Memorial Plaza Commission. The site plan included the Municipal Auditorium, Civil Courts Building, and Soldiers' Memorial. The Municipal Auditorium was planned to include a large convention hall, opera house, exposition hall, and meeting

rooms. One stage would serve the convention hall and the opera house and close the open end of the facility's half oval. The promotional booklet touted the facility's planned capacity to accommodate conventions, exhibitions, concerts, opera, patriotic gatherings, and athletic meets.

The auditorium's colonnaded, stone north front on Market Street (fig. 5.8), mocked by Frank Lloyd Wright in the newspapers as a "shapeless mass" and "hopelessly dated"[26] and praised by Ralph Adams Cram as "good modernism",[27] was distinguished by an epigraph and independent quotations from German-born Carl Schurz (Civil War general, newspaperman and United States Senator) and Woodrow Wilson. Wilson's inscription spoke to the goal of excluding misunderstanding through the interchange of points of view in the wider world and in the present setting, the Municipal Auditorium. The mayoral proclamation issued upon the building's completion noted that it was "designed to enrich the peoples' lives and increase their enjoyment and add to the attractiveness and popularity of our City as it will bring to us great conventions and cultural activities."[28] The front entrance of base, column, entablature and attic admitted no possibility of interruption by a marquee within its visual system; instead, a ground-mounted standard offered space for manually arranged letters.

The interior (fig. 5.9) formed one-half of a Greek stadium, a configuration employed earlier in the Teatro Farnese, Parma (1618-28) and, for example, in the design for a customs house by Alphonse de Gisors for the 1823 Grand Prix (fig. 5.10) and the plan (but without the stalactitic interior surfaces) of Hans Poelzig's Grosses Schauspielhaus, Berlin, of 1919.

The half oval format was likely to produce a broad footprint in any event, but accommodating the ambitious program, providing fulsome attendee passages, and recognizing important differences in the nature of arena vs. stage presentation emphasized lateral expansion. The nature of the relationship between spectator and event differed between arena and theater and generated considerable additional design and building systems concern, expressed in dense schedules reflecting the programmatic complexity. The facilities provided could not always perform double duty, in part because of the necessity to provide for the possibility of presenting simultaneous events in the arena and opera house but also because of the reality of different needs. Arena spectacle involved large numbers of participants but did not often require the spectator to suspend disbelief. The nature of the event, the open dimensionality of the observed space, and the omniscient quality of the spectator's view all worked to make unnecessary the formation of an independent, fully dimensional world within the world inside the arena's portals. Even in its proscenium stage format (usually intended for lectures or meetings), the convention hall did not enable its audience to enter the imagined, but visible, environment behind the proscenium. That was what the opera house stage was for. The back-room space that was provided for opera house performance and performers generated sets of functional rooms detailed in long specification lists of subdivisions for closets; dressing, property, and check rooms, all with their own heating, ventilation and electrical requirements.

The Kiel Auditorium seating plan revealed the sponsorship's interest in deriving value from the upper reaches of the bowl. By dividing the balcony into

mezzanine and loge boxes (fig. 5.11) the facility serviced two price levels from a single upper level concourse: a large amount of lower-priced seating and a smaller amount of privileged loge seating. The extent of the mezzanine seating signaled management's expectation that sports events, not conventions, would constitute the major part of the business and that adequate view and event comprehension could be delivered to that level. At the same time, the range of color that could be projected from light positions in the cove ceiling onto ceiling surfaces was substantially reduced from the original specification.[29] This was an indication that management intended to rely less on the ability to create effects in shaping the interior environment and depend more on direct lighting of the arena floor.

Bartholomew's favored values of "order, simplicity, harmony" for civic buildings, combined with his rearrangement of urban streets in a hierarchy oriented toward automobile access, created a powerful theoretical frame for urban redevelopment process. His firm's urban plans, as well as the actions of the cities and state highway departments who implemented them or were influenced by them, constituted on the whole the practical, native expression of the Corbusian project to expand the urban scale and separate its components.

Corbusier had in 1922 projected the scheme "Ideal City of 3,000,000 at the Paris Salon d'Automne. Here he specified residential towers and slabs rising from areas free of streets and buildings. Corbusier's 1925 Voisin Plan for Paris separated automobile traffic from pedestrians. His Ville Radieuse (1922-35) developed hierarchies of roads for accessing individual buildings. The linking of traffic management with clearance of areas

designated as slums, articulated in Corbusier's *Des Canons des Munitions?* (Paris, 1938), provided a base for Bartholomew's contractual advice to cities throughout North America.[30]

Vector Siting

The placement of the auditorium at a point on a linear system occurred throughout the country during the entire interwar period. In at least one case, the architect coordinated the shape of the building with that of its site. The city of Lowell, MA borrowed $1,000,000 to erect a memorial to the servicemen and women of all of the country's wars. Lowell Memorial Auditorium (Blackall, Clapp and Whittemore, 1922; figs. 5.12-5.13) marked the eastern boundary of the city's central district along Merrimack Street and was a counterpoint to the city hall and library situated at the western end. Clarence Howard Blackall used seating, floor, and stage to form an ovoid which he placed within the triangle suggested by the site. Blackall had employed a comparable curvilinear plan with vestibule for his auditorium at the University of Illinois, Urbana-Champaign (1906-07). Attendees in Lowell moved through a formal approach and Hall of Trophies to reach a concourse and access to meeting rooms which occupied two corners of the triangle. The architect, responding to a multi-purpose building program for the auditorium, strained to allow seating for both proscenium stage and arena configurations while maintaining an overall unity of design. The configuration provided floor seating directed to the proscenium stage; balcony and gallery seating directed to the arena floor when cleared of seats, and compromised views from balcony positions close

to the proscenium. The broad splay of the upper seating was typical of several multi-purpose arena-auditoriums of the period, including the tile-crowned San Antonio Municipal Auditorium by the Paul Cret student Robert Moss Ayers (with Atlee B. Ayres, George Willis and Emmett T. Jackson, 1926). Blackall, a designer of theaters, aimed for an elegant, finished result. He used stone, plaster, glass, metal, brick, and marble to create a product that aligned with his own published preference for "good-looking" jobs – they rented, sold, and wore better.[31] Lowell's portico on granite oriented the entire structure to its irregular site. Brick and cast stone swelled behind the entrance in an ovoid, reflecting the form of the main auditorium within. Stone courses set against brick extended the temple front to each side. Horizontal medallioned panels echoed the shape of the entablature and assisted the transition from the temple front to the curves and diagonals in back.

Main Street in Worcester, MA was the link that connected City Hall and Worcester Commons with Lincoln Square, the site of Memorial Auditorium (Lucius W. Briggs and Frederick C. Hirons, 1931-32; figs. 5.14-5.15). The Worcester memorial was proposed initially in 1917 and considered for placement on the common with other new public buildings. This proved to be too expensive, delaying construction until another site could be found.[32] Limestone over a granite base enclosed a rich interior, with murals (Leon Kroll, 1939-41). Kroll's catalog of figures included wealthy citizens, laborers, farmers, military personnel, and people in various stages of life. The mural depicted a kind of literal diversity. Kroll wanted to express the community coming together in wartime. The combination of arts was considered to be a democratizing act itself. Hirons,

working with the local architect Briggs, positioned the auditorium's severe Doric face on the square, a Main Street closure and confluence point for several other streets. Hirons had recently won the commission for the George Rogers Clark Memorial (Vincennes, IN) with a design for a tempietto enclosing murals and statuary. The architects, in favoring the temple front of eight fluted Doric columns, accepted the narrow site between existing streets. In order to provide even the modest capacity of 3,446 persons, and an arena suitable for sports, the attenuated and level arena floor extended well back from the stage, resulting in poor views for many patrons. The procrustean length of the arena floor was the facility's controlling and distorting dimension.

In contrast to the Lowell building's purposeful arrangement of form and materials, the Worcester design suggested a less thoughtful importation of the academic classicism of the Lincoln Memorial (Henry Bacon, 1912-22) or the Federal Triangle, in formation under Edward H. Bennett after 1926. Worcester's colonnade and bronze doors projected an alien, if grand, presence.

The Lowell and Worcester buildings occupied points on streets. Their main entrances oriented toward approach paths originating from within the cities' primary circulation systems. Other municipalities sited their facilities along edge arterials in order to attract patronage from the suburbs and, in some cases, from developing exurbs. The Rhode Island State Auditorium in Providence (1925-26) was a pitched-roof shed derived from the earlier Boston Arena, whose management in fact participated in the governance of the Providence venue.[33] The building was located on North Main Street well east of the visually dominant State House but appearing to align with it. The median-prepared

North Main Street, designated U. S. Route 1 and near Route 44, served the outlying market in the directions of Boston and Hartford. When an arena was sited in an area once essentially residential, resulting dependant commercial uses brought jarring street-level alterations (fig. 5.16).

The larger Memorial Auditorium in Buffalo (Green and James, 1938-40; fig. 5.17) was a truss-roofed brown shed encased within the gray brick and limestone planes of modern classicism. Not simply a point of visual focus, the building commanded an entire area. The city placed the project at the foot of Main Street on a former market site near the old Erie Canal bed and Buffalo River. The Public Works Administration's financial assistance represented federal participation in an improvement scheme based on the clearance of property thought by the municipality to be underperforming.

The Buffalo Memorial Auditorium, a full oval, had no stage in the main hall. The focus of attention was the level or inclined arena floor, approachable from street entrances on two sides. The Buffalo sponsorship was aware of the success of 90 miles-distant Maple Leaf Gardens in Toronto and of the developing commercial potential of the Buffalo Bisons, a minor league team operating since 1928 in the Canadian Professional Hockey League. R. Maxwell James, writing for his professional colleagues, attempted to distinguish his building from the public and private examples he studied before arriving at his Buffalo design. The architect claimed that his building was like nothing he had observed, the examples including the Cleveland Public Auditorium.[34] In comparison with the Cleveland facility, whose oval was truncated by a proscenium stage, the Buffalo seating bowl was a full oval. Concourses surrounded the seating bowls in both buildings

with main entrances at one of the ends, as was common. James's treatment of the narrow window strips of the rounded corners on the north front was energizing. The strips rendered the corners as kinetic elements, reflecting the movement of automobiles around the building.

Revenue from sports and related concessions constituted the main revenue sources.[35] The New York State Thruway was finished in Buffalo by 1957, bringing to the Auditorium's terrace a building-isolating thoroughfare of size and speed. In this sense the Buffalo project was a precursor of the federal urban clearance practice of the succeeding decade, by which land was repurposed to accommodate highway access to downtown. The later schemes attempted to create new destinations for the public, including entertainment venues like the Buffalo "Aud."

Independent Siting

Roofed arenas with public sponsorship were also, of course, built outside of grouped and vectored configurations. The Philadelphia Municipal Auditorium (Convention Hall, Philip H. Johnson, 1929-31; fig. 5.18) was placed in the midst of an existing trade and manufactured products show facility established in 1894 at the close of the World's Columbian Exposition in Chicago. A series of buildings west of the Schuylkill River, well to the south of Market Street, had served as a kind of permanent display of the world of international trade and manufacture. In 1899 the buildings, labeled collectively as the Commercial Museum, accommodated the National Export Exhibition, an event intended to expand national and regional trade. Philadelphia, with

substantial uptown manufacturing and a longtime national role in wholesaling and retailing, sought to maintain and enhance its standing in the new international commercial environment in the new century. The Commercial Museum, whose primary building was dressed in white terra-cotta, was not in fact a museum but a city-sponsored foreign trade organization offering to the general population information and exhibits of manufactured materials and, to Philadelphia businesses, pragmatic help in carrying out international exchange.[36]

The city identified a site at the foot of 34th Street at Vintage Avenue, between buildings of the Commercial Museum and opposite Philadelphia General Hospital. The great bulk of the building, inserted in this space, claimed the visual focus at the intersection where it created a landscaped, curving forecourt in reflection of its own arched roof. The internal arrangement provided an oval floor truncated at the eastern end by a stage. Lobby, restaurant, and ballroom occupied the entrance area. Between the entrance and the stage two curving systems paired to form seating bowl and roof. Subdivided rectilinear space under the seating bowl supported the arena event by providing room for public and office functions. Electrical and mechanical building systems were masked behind and below bronze, terrazzo, and accented marble. Supplied light was apparent, with the light source usually unseen. Heavy and large exhibits could be accommodated by the rail siding connecting with the basement on the east side. Underground passages led from the new building to the existing ones, facilitating the coordination of space for exhibitions. Philip H. Johnson understood the construction of large and long-spanned buildings for the public sector, having designed at least five

armories in southeastern Pennsylvania (including in 1915-1916, with alterations in 1919, of the nearby pitched-roof 103rd Cavalry Armory at 32nd Street and Lancaster Avenue) and many facilities for the Philadelphia City Department of Public Health, including Philadelphia General Hospital.[37]

If the programmatic and service spaces were by this time well-defined for a building of this kind, the options for treatment of the limestone exterior afforded opportunity to apply landmark features. This included the building's river face. The Schuylkill River provided a highway-like progressive view of the series of buildings on the west side of the river beginning (or ending) at Convention Hall, the view not seriously impeded by the railroad. The progression, not available from the land side because of the street pattern, included the west court and rotunda of the Free Museum of the University of Pennsylvania (Wilson Eyre, Jr.; Cope and Stewardson; Frank Miles Day & Brother; 1893-99; additions and alterations by successor firms; 1912-14 and later); and two essentially adjacent venues of public assembly, the Palestra (Day & Klauder, 1925-28) and the Franklin Field upper deck (Day & Klauder, 1925). Convention Hall's applied elements supported the objectives set forth by the city and the Mayor Harry A. Mackey, who closely associated himself with the project and considered Convention Hall as a vehicle for Philadelphia's economic advancement. The arena's published prospectus presented the building, backed by Riverside Drive, as "overlooking the Schuylkill." The continuation of the frieze at the corner pilasters on the river side established the eastern end as something more than a service entrance and rail siding.[38] Convention Hall's river face was articulated by pilasters. A windowed pavilion was placed at the eastern end

above the stage's fly space possibly to house equipment and to underscore better the building's limit, just as was done in the stepped façades, concrete panels, and escutcheons of the Palestra and Franklin Field.

Convention Hall's allegorical figures, presented in medium relief across the building, gave some indication of the arena's project as a venue for display (following the Commercial Museum use) and performance. The entrance block carried the names of composers, together with symbols representing architecture, sculpture, and painting. The imagery of the medallions and frieze evoked industrial trades and the hemisphere of the Americas. Athletic imagery did not appear. The arena presented to the wider world the city's accomplishments in the arts, sciences, and technology, some of which were derived from the country's European heritage. Athletics played an increasing role in the business life of the venue. Yet its adequacy for the presentation of ice-oriented events, as well as the contemporaneity of its late stripped classicism, were called into question by the 1939 proposal made by the owners of the Philadelphia Arena, Convention Hall's commercial rival. Newspapers reported the Arena's planned reconstruction and transformation into a contemporary commercial package of brick and stone with vertically configured windows, in the manner of Boston Garden.[38] Convention Hall, with its contiguous exhibition facilities renewed or replaced in the 1960s, served for another thirty years.

Kansas City, Missouri, with favorable location, hotels, and transportation facilities, had long established itself as a convention destination by the time planning began for a new auditorium. In the postwar period the city's leadership defended against challenges from Chicago, Cleveland, and St. Louis by proposing a new facility for its

perceived "New West" audience but failed repeatedly to secure financing. A planned civic group did not include an auditorium component. After the election in 1930 of a new mayor the auditorium bond passed, and the components of the civic group pulled apart and deposited as independent elements in the central business district.[40] The Municipal Auditorium in Kansas City (Gentry, Voskamp & Neville; Hoit, Price & Barnes, Associated Architects, 1929-36; figs. 5.19-5.22), possibly influenced by the format of Kiel Auditorium in St. Louis, was initially to have included an oval whose open end would have been closed by a stage. Ultimately this was rejected in favor of establishing a stage in a smaller hall accessible from the building's lobby. The Municipal Auditorium's external presentation differed from Kiel's in its departure from the latter's street-centered, frontal alignment, colonnaded, classical revival presentation. At Kansas City, the designers created a blank-walled envelope with a tripartite, graduated profile and elevated central section and applied to it a modified Art Deco aesthetic. Wall expanses were treated as decorative fields, not embellished but set off as planar surfaces against zones of focused ornament, as was done, for example, on the river face of the Civic Opera Building in Chicago (Graham, Anderson, Probst & White, 1929). The Kansas City auditorium's external ornament included friezes celebrating the industry and agriculture of the Midwest, carved stone medallions, and aluminum flagpoles. The external planes of stone formed a volume encompassing the breadth and length of the pitched-roof auditorium and therefore dominating it.

Inside the auditorium, the plan (fig. 5.22) facilitated the paths of attendees through the foyer, around the concourse (and, notably, to its service spaces, including rest

rooms), into the arena, and to the subsidiary performance spaces. The dense plan implemented under the RCA Building, 30 Rockefeller Plaza (Associated Architects: Reinhard & Hofmeister; Corbett, Harrison & MacMurray; Raymond Hood, Godley & Fouilhoux, 1933) distributed transaction points (in this case, stores) around the concourse in the same manner without, of course, a core destination comparable to the arena inside the perimeter. Awareness of position and movement toward entrances, exits, and thresholds was aided by the clarifying views of light sources and the pace of motion of people as seen from a distance. Grand Central Terminal (Warren & Wetmore, Reed & Stem, 1903-13) offered such user perspectives through Charles Reed's management of ramps and passages in a related but much more complicated Beaux-Arts program.[41] Grand Central's scalable ramp deployment was followed in the Kansas facility and has since been used in other arenas and stadia.

Streamlined aluminum and stainless steel fixtures combined with marble and color to create a sophisticated environment lit extensively by installations facilitated by the Kansas City Power and Light Company and proudly advertised by that company in the *Kansas City Star*.[42] Following contemporary practice, the reflective surfaces of walls and ceilings were treated as secondary light sources. Taking temporary leave from their daily environment, visitors moved in gradually more subtly-lit spaces as they progressed from lobby through foyer and into the auditorium.[43] Cove lighting and roof finish masked all support and duct work (figs. 5.20-5.21). A number of street entrances provided approaches that channeled the visitor through key bisected built elements, including each half of the concourse. The Kiel Auditorium in Saint Louis expressed the

civic ideal through its placement within a dedicated environment, revived classicism, and exhorting inscriptions. Kansas City's auditorium included a program of carved images representing the realms of arena activities within and the region and nation on the outside. But the main appeal of Municipal Auditorium was not made on the basis of any specific applied element but on the overall sense that the visitor would be well treated in a modern, comfortable, and elegant environment. The nature of "civic" was changing. Kansas City was one of the first venues to market cleanliness, convenience and service.

The elements essential for a multi-purpose arena did not change significantly during the period. Sponsors wanted to see arena floor, seating, aisles, and concourses arranged in a generally functional manner. They desired a facility with a standard of mechanical installation and equipment that met or exceeded the expectation of the audience occupying the public spaces. Attendees would not see the technology but would experience its effect. Outside of the building committee, issues of architectural design carried less weight than the air conditioning, projection equipment, and the conference meeting rooms.[44]

The municipal arena of the interwar period relied on revenue generated by popular attractions to ease the public subvention of construction and operating costs. By their siting and architectural program, such facilities sought to project to their communities a message of the stability and fairness of local government and a citizenship ideal that rewarded responsible participation in society. Usually the civic group was near the business district but distinct from it.

Atlantic City was the resort destination for the workingman and the tradeshow objective for industrial manufacturers from Philadelphia and the nation. The municipal arena, part of the seaside commercial zone, addressed itself to the transient population served by the residents occupying the dense quarters behind the boardwalk. The municipality created Convention Hall (Lockwood Greene Engineers, Boston, Architects; Cook & Blount, Associated Architects, 1927-29; fig. 5.23), and the working population staffed it. The building massed on the boardwalk and beach in two mammoth elements, head house and auditorium. Contemporary printed views often were adjusted to distinguish the privileged head house pavilion from the less-favored exterior of the auditorium. The architects designed an entrance structure that would have appeared to vacationing attendees as exotic. The head house balanced towers on both sides of a ground-level entrance, above which rose a loggia inspired by sixteenth-century Venetian work, e.g., Sansovino's Library of St. Mark's (begun in 1537). The hinged trusses of the auditorium produced a blunt exterior whose utilitarian arching required application of distracting treatment. A colonnaded limestone entrance shared with the side walls of the auditorium a series of arches intended to reduce the visual effect of the auditorium's weighty arch. Gigantism was married with the amusement park characteristic of framing a commercial attraction within a derived classical form: in Coney Island, a recycled Greek Revival frame for a Dodg'em concession[45]; in Atlantic City, a commercial Italianate colonnade fronting a lowering barrel vault.

Inside, the Convention Hall architects offered transient business clients and convention attendees the pragmatic and the fanciful. Space was declared to serve the one

or the other purpose. The corridor outside the auditorium did not offer positions for concession business, as a concourse would have. Rented retail shops, though present and lauded for their revenue production by the Municipal Administrations Service[46] opened to boardwalk and street. This external stance reduced the shops' relation to the auditorium, where their role would have been more complex. The design reflected the facility's expected dependence on convention business by providing substantial storage space integral to the plan. Usually, the exhibitor found lesser storage in undesignated areas. But within the convention realm storage needs linked closely to revenue and were likely to be better served.

The auditorium trusses were encased in forms containing light sources designed to create a brilliant interior effect. Adler and Sullivan had treated roof support in a comparable manner in the Auditorium Theater, Chicago (1887-89). And there was plenty of supplied colored light in the theater palaces of the first decades of the twentieth century. But in Atlantic City, the great vault itself provided surface for illumination and projection, dematerializing agents whose intervention placed Convention Hall in a line of development of modern theatrical space with, for example, Joseph Urban's auditorium for the New School for Social Research, New York (1930); Corbett, Harrison & MacMurray's Bushnell Memorial Hall, Hartford, CT (1930), with flattened reflecting curves; and Radio City Music Hall (Edward Durrell Stone, design architect; Donald Deskey, interior design coordinator; with the Rockefeller Center Associated Architects, 1930-32). The lighting system's contribution was, however, transitory; it demanded too much maintenance attention and was abandoned.[47]

Agricultural Complex

The inter-war livestock coliseum was built largely by public interests to serve the state or regional agricultural industry. But in several instances, coliseum sponsors tried to attract the arena-entertainment audience, as well. In the larger cities, these facilities competed with other venues for that audience. Their contiguous cattle pens and associated buildings required locations removed, but not distant from, central urban districts and population centers. Agricultural expositions brought their own audiences, which were substantial in size. As the number of households with private automobiles increased, exposition facilities expanded parking accommodation and nearby road infrastructure.

Livestock arenas erected before the Depression generally followed the factory model but sometimes used new materials or were completed using new techniques. An arched or pitched roof enclosed a space entered through a portico at one of the ends or, as in the New York State Fair Coliseum at Syracuse, at the midpoint of the long dimension.

The Michigan State Fair Coliseum in Detroit (Lynn W. Fry and the State of Michigan Building Department, 1922-26; fig. 5.24) was representative of many of the fairgrounds arenas constructed during the period. The Detroit building, entered at one end, had a roof monitor and used the exposed arched truss. National trade-press advertisements for a new brand of precast roof plank with glass insert featured its use in the Coliseum. Each bottom chord of each truss sprung from amidst the seating bowl,

sometimes from the center of an aisle. The uninsulated structure allowed considerable natural light, was difficult to clean and expensive to heat, cool, and illuminate.[48]

The St. Louis Arena (Gustel R. Kiewitt with Hermann M. Sohrmann, 1929 (figs. 5.25-5.26), with adjoining buildings, was planned by the city's business community for the National Dairy Show, conventions, and livestock expositions. The entrance was marked by a pair of scaled-down, stepped towers employing widely-used Art Deco forms and super graphics comparable to the contemporaneous Richfield Building in Los Angeles (Morgan, Walls and Clements, 1928). Cantilever trusses formed a continuous curve along an oval model, creating a bulging fullness similar to Hermann Dernburg's Berlin *Sportpalast* main building (1909-10; fig. 5.27). The Berlin arena was situated behind a substantial headhouse. The St. Louis building's volumetric reflection of the internal oval had appeared in François-Louis Boulanger's 1835 project for a Winter Garden pavilion (fig. 5.28) and in a few other buildings in the southern United States.[49] The oval footprint, but with a different overall volume, was used after World War II in the Spectrum, Philadelphia (Skidmore, Owings and Merrill; Myron Goldsmith, Michael Pado, Albert Lockett; with Tizian Associates, 1966-67), Beard-Eaves Memorial Coliseum, Auburn University, Auburn, AL (Sherlock, Smith & Adams, Montogmery, 1968-69); Nassau Veterans Memorial Coliseum, Uniondale, NY (Welton Beckett and Associates; 1969-72); and elsewhere. In general, architects preferred rectilinear geometries between concourse and perimeter, which allowed more regular ancillary room subdivision.

Kiewitt and Sohrmann used a wooden roof system of latticed strips of Douglas fir to carry the roof upward from a monitor located at the highest point of the cantilever. The Lamella Roof Syndicate of New York marketed its "trussless roof" as a way to achieve a graceful and unobstructed interior [50] The steel and wood system may have allowed some savings in construction time but was not in fact trussless, given the composition of the box girder. In addition, the anchoring of the cantilever impeded some views of the arena floor. The Lamella Syndicate was willing to compete with the dominant continuous arched truss technology and imply through advertisements its supposed retrograde and graceless quality. Lamella's aesthetic critique of the arched truss was based on its expectation that architects (and audiences) preferred ceilings to be free of visible engineering elements and that laying a visible network of wooden strips was an attractive alternative to both visible steel or steel hidden above a false ceiling. Lamella's marketing ploy was specious in any event because of the increasing demand for interior temperature control and air handling in these buildings and the substantial below-the-roof duct work that required.

Abraham Epstein's International Amphitheater (1934; fig. 5.29), built for Chicago's Union Stock Yard and Transit Company, was a pitched-roof shed with monitor, located adjacent to the stockyard and used for the annual International Livestock Exposition and other events. Epstein's arena spread along the southern reaches of Halsted Street on the city's south side and was designed to host the livestock show. Outside, rail cars and penned cattle presented an impressive but confusing sight for visitors. During show dates the main arena and wings constituted an expository analogue of the

labyrinthine expanse outside. Industry decentralization and trucking took hold in the 1950s and 1960s and reduced the importance of stockyard operations. The facility lost its single-purpose calibration and became simply a large-capacity venue for occasional events. But even during its interwar heyday, the facility's architecture actually reduced its own capacity to produce revenue. Considered in plan, the arena was only a single element, if a central one, of the entire plant. The booths and aisles of the two exhibition wings began immediately outside the long dimensions of the arena, supplanting any concourse and thereby eliminating the capacity of a concourse to begin the process of changing arena attendees' normative behavior as they approached the site of spectacle. Building management lost the opportunity to extract value from attendees through their arena event-driven purchasing decisions made at management's rented or owned concourse concessions. The absence of this supporting zone diluted management's ability to bring customers within the event's sphere of influence.

Public projects of the late 1930s revealed increased sponsor interest in using the livestock arena to attract the general public on a year-round basis. The San Francisco Chamber of Commerce, surveying in the 1920s, identified community interest in bringing to the area a major livestock show. People remembered the success of the display at the 1915 Pan-Pacific International Exposition. Public confidence wavered and delayed construction, but the California Exposition Building or Cow Palace (W.D. Peugh, 1935-46; figs. 5.30-5.31) claimed attention by its arresting exterior and efficient interior plan. Peugh used cantilevers and centered the roof structure with a hinged arch. The exposed top chord of the cantilever, repeated across the roof, created an awkward contrast with the

building's surrounding hills as insistent in its way as that formed by the abstraction of Apollo's temple against the wild landscape at Bassae. The internal plan of the Cow Palace was comparable to that of the somewhat earlier Chicago Amphitheater but included a concourse populated with both exhibition booths and concession sites.

Pennsylvania's General State Authority, created in 1935 to facilitate the construction and modernization of the state's hospitals, teachers' colleges, prisons, armories, and other buildings, sold the bonds to fund the Farm Show Large Arena in Harrisburg (Verus T. Ritter, 1937-39; fig. 5.32). Ritter placed all functions within a pitched-roof enclosure supported by rigid frames. Piers, stonework, and theatrical marquees marked the entrance pavilions. In envisioning this state work, Ritter (recently emerged from his Philadelphia partnership with Howell L. Shay) understood the cost implications of dark calendar dates and the potential of operations to defray construction expense. With his winning bid, Ritter submitted to the Farm Products Show Commission proposals for converting the arena floor to an ice surface and for leasing the building to an operator responsible for obtaining rentals. But the arena's main purpose was to host the annual exposition and to project to the Commonwealth the achievement of its largest industry and to facilitate the exchange of information on marketing the agricultural product.[51]

The Indianapolis firm of Russ and Harrison used a similar pitched roof and rigid frame for the Indiana State Fair Coliseum of 1935-39 (figs. 5.33-5.34). Chicago Stadium owner Arthur M. Wirtz, the principal behind construction, recognized a market for presentation of glamorous figure skating. The architects covered the shed with a dour

kind of vertical streamlining arranged in a strong, enveloping horizontal which was intended to establish an institutional presence as seen from the street. Based on the built result, Wirtz was either inattentive or tolerated confusion between his management staff and the architect. First, the architect's arbitrary telescoping of the building at both ends reduced the amount of seating in no less than twelve sections. The inclusion of dedicated space for ten snack concessions demonstrated interest in encouraging discretionary spending. But the generous seating bowl cross aisle provided a continuous internal promenade and allowed attendees to enter any section, subject to whatever usher control might have been exercised. The cross aisle permitted those who did not need the rest facilities to move about without exposure to the concessions or regulation by portal ushers.

The Indiana Coliseum management expected the entrance turnstiles and lobbies to regulate crowd flow to their advantage.[52] The turnstiles and lobbies provided a staffed zone of controlled ingress. The metering of the arrival rate would have caused lines to form in the lobby and outside the building. This was an acceptable consequence. The guidelines published by the National Bureau of Standards in 1935 focused on configuration for egress. Incidence of mass craze and compressive asphyxia in arenas had not yet been documented.[53]

Forth Worth, Texas, civic and business leaders established in 1936 a livestock center. Unlike other complexes based on an arena flanked by cattle pens and stock chutes, the elegant Will Rogers Memorial Center (Wyatt C. Hedrick, Herman P. Koeppe, Herbert M. Hinckley, and Elmer G. Withers Architectural Co; 1936-37; fig.

5.35) offered arena, auditorium, and landmark tower, this last element almost a quotation from Eliel Saarinen's Helsinki Railroad Station of 1910-14. Auxiliary buildings were located behind. Its immediate purpose was to accommodate the activities of the Frontier Centennial, commemorating the one hundredth year of Texas. A Public Works Administration grant and municipal and private funds supported the Frontier Centennial construction and other local civic projects. Arena and auditorium shared convex facades, terrazzo floors, glass block, tile mosaic friezes, and Moderne motifs. The Pioneer Tower monolith bound together the ensemble. The Fort Worth arena replaced Northside Coliseum as the city's main venue for indoor spectacle. Engineer Herbert M. Hinckley's splayed arched roof trusses were not revolutionary, as has been claimed.[54] By the late 1930s there were a number of strategies available for achievement of column-free arena interiors. Hinckley implemented an existing roof solution used the previous year for the Swarthmore College Field House, Swarthmore, PA (Walter T. Karcher and Livingston Smith, with Robert E. Lamb,1935).

Civic identity was not a unique value that could be reflected and transmitted by set elements of an arena's architectural form. But the inter-war period's planners and architects tried to evoke it by using the generic associations of academic classicism or its stripped alternative. This allowed the temple front, generally suitable to encompass the breadth of an arena entrance, to dominate the non-agricultural field. Columns were expressed as full or shallow projections. A sameness resulted, due in part to the reuse of plans (e.g., the facilities in Memphis and New Orleans[55)], but in greater measure because of the capacity of past styles, rendered in generous scale, to confer a timeless quality on

the renewed civic precincts. For the administrators of municipal government, differentiation of the civic realm removed it from the periodic jeopardy of the business cycle. Arenas within agricultural complexes eschewed the revived Beaux-Arts temple but did accept bestigial columns expressed as groups of parallel strips and openings.

The arena, with its capacity to reshape underperforming urban sectors, its broad appeal, and its variety of hosted events, fit readily within the municipal projects of the period. Yet identity and expectations were mixed. The civic arena was conceived as a non-industrial, non-commercial instrument of public policy. Management collected rental income when it could. Located apart from the central business district, the arena was usually unable to sustain itself financially without subsidy. But it was useful to planners, such as the prolific Harland Bartholomew, as a large, scale-altering urban entity. Building footprints grew larger, streets of approach became wider. The larger municipal arenas often were part of group developments. But cities projected their smaller arenas' civic instrumentality, in many cases outside of group configuration, with no less expectation.

The civic realm built the arena to accommodate a mix of ticketed and free events. The circumstances of site varied but the facility projected affinity with the institutions of public authority and purpose. Classical exteriors proclaimed a timeless quality. The finished ceilings, floors, and hardware-rich walls and corridors reflected aspirations of stability and continuity. Ever more sophisticated building systems operated out of general view. The public weal swept away old structure in order to provide new venues and facilities. The arena's leverage gained the attention of urban enablers interested in operating on an even greater scale.

NOTES FOR CHAPTER 5

[1] Egerton Swartwout, "The Design and Plan of Auditoriums," *Southern Architect and Building News* 54, 11 (Nov. 1928): 43. For his own armory design, see "Washington Armory: Design," *American Architect and Architecture* 19, pt. 2, no. 1849 (May 31, 1911): 196-97.

[2] A few park-and-rec gyms with permanent seating achieved wide recognition. San Francisco Golden Gate Park's Kezar Pavilion (Willis Polk Company?; ca. 1923-25; fig. 5.2), a Mediterranean Revival-finished, tile-roofed concrete shed with blind arcading and arched windows, became nationally known as a television broadcast venue for Roller Derby. See Katherine Wilson, *Golden Gate: The Park of a Thousand Vistas* (Caldwell, ID: Caxton Printers, 1947), 116, 141. Works Progress Administration of Northern California, *San Francisco, the Bay and Its Cities*, 2nd. ed. (New York: Hastings House, 1947), 353-54.

[3] The bi-directional stage had been suggested by the position of "nave" (now Annenberg Hall) and "apse" (the deep well of Sanders Theater) in Harvard's Memorial Hall (Ware and Van Brunt; 1866-78), though Sanders' stage oriented only to one side, separated as it was from Annenberg Hall by the high volume of Memorial Transept.

[4] The International Association of Auditorium Managers, formed in 1924, tried to assist managers of individual facilities by facilitating information exchange within the industry. International Association of Auditorium Managers, *Auditoriums and Arenas: Facts from a Survey* (Chicago, IL: Publication Administration Service, 1961), 9-11; *International Association of Auditorium Managers 1925-1975: The First Fifty Years* (Cincinnati, OH: Amusement Business, 1976), 7; Farrell G. Symons, *Municipal Auditoriums* (Chicago, IL: Public Administration Service, 1950), 3, 15, 17, 31.

[5] See Ann Hall, *Sport in Canadian Society* (Toronto: McClelland & Stewart, 1992), 36.

[6] Arthur D. Little, Inc., *Report to the County of Los Angeles on a New Auditorium and Music Center* (Cambridge, MA: Arthur D. Little, 1956), 6; Ernest E. Means, *Planning a Municipal Auditorium* (Tallahassee, FL: Florida State University, 1955), 16; William B.

Munro, *Municipal Government and Administration* (New York: MacMillan, 1923), 2: 86; Lisa Reitzes, "Moderately Modern: Interpreting the Architecture of the Public Works Administration," Ph. D. diss., University of Delaware, 139; Symons, 2, 17. Later, in wartime, financial reports revealed one arena's substantial loss of income due to management's reluctance to bill at established rates the organizations (e.g., U.S.O, American Legion) working to meet national or municipal objectives: *Annual Operations Report 1941-42* (St. Louis, MO: Municipal Auditorium, May 15, 1942), n.p..

[7] In Europe, at least one important roofed arena built in the first decade of the century was renovated in the second, with roof engineering rendered invisible by application of decorative covering, in this case multicolored plaster lath: the Berlin *Sportpalast* of 1909-10 (Hermann Dernburg) with 1925 renovations by the theater architect Oskar Kaufmann. See Alfons Ahrenhovel, *Arena der Leidenschaften: Der Berliner Sportpalast* (Berlin: Ahrenhovel, 1990), 7, 9, 17; Antje Hansen, *Oskar Kaufmann: Ein Theaterarchitekt zwischen Tradition und Moderne* (Berlin: Gebr. Mann, 2001), 348-51.

[8] "Iceland Skating Rink, New York," *Architecture and Building* 55, no. 1 (Jan. 1923): 7, 8, pl. 12.

[9] Means, 16.

[10] Arthur T. North, "Proposed Victory Square and Civic Center, Bloomington, Illinois," *American Architect* 117, pt. 1, no. 2310 (Mar. 31, 1920): 400-402.

[11] J. W. Fitsell to author, Mar. 25, 1994.

[12] *Houston Architectural Survey* (Houston, TX: Rice University, Southwest Center for Urban Research, 1980), 1: 204-49.

[13] "Cleveland Auditorium," *American Architect* 119, no. 2350 (Jan. 5, 1921): 21-25; "Cleveland Public Hall," *Architecture and Building* 53, no. 1 (Jan. 1921): 8.

[14] Cleveland State University Library, "Tom L. Johnson's Story," http://clevelandmemory.org/ebooks/johnson/ch012.html, accessed Dec. 1, 2005.

[15] John J. Grabowski, *The Terminal Tower, Tower City Center: A Historical Perspective* (Cleveland, OH: Western Reserve Historical Society, 1990), 25-26.

[16] Eric Johannesen, *Cleveland Architecture, 1876-1976* (Cleveland, OH: Western Reserve Historical Society, 1979), 152.

[17] Ibid.

[18] Attention paid to building systems in theaters informed the development of systems for arenas. See Charles Merrick Gay and Charles De van Fawcett, *Mechanical and Electrical Equipment for Buildings* (New York: J. Wiley & Sons, 1935), 208. Harold MacDowell's experience with the Cleveland Public Auditorium allowed him to establish a consulting business in acoustical design and sound control. See the 1923 drawing (Athenaeum of Philadelphia HCR 139*019) prepared by Macoustic Engineering Company for alterations and additions to the Harcum School, Bryn Mawr, PA (John F. Harbison with Paul Cret).

[19] *The St. Louis Municipal Auditorium* (St. Louis, MO: St. Louis Convention Publicity and Tourist Bureau, 1932).

[20] Johannesen, 73.

[21] The encapsulation of commercial activity within a prominent civic envelope already had taken place in North America. In 1817 the Common Council of the City of New York granted the painter John Vanderlyn a lease of property near City Hall. Vanderlyn's pantheonic Rotunda, designed by Alexander Jackson Davis, housed painted panoramas for ticketed public viewing. See Kevin J. Avery and Peter L. Fodera, *John Vanderlyn's Panoramic View of the Palace and Gardens of Versailles* (New York: Metropolitan Museum of Art. 1988), 19, 21.

[22] See Eldridge Lovelace, *Harland Bartholomew: His Contributions to American Urban Planning* (Champaign, IL: University of Illinois Dept. of Urban and Regional Planning, 1993), 3, A-26, 53, 74; Jon A. Peterson, *The Birth of City Planning in the United States, 1840-1917* (Baltimore, MD: Johns Hopkins University Press, 2003), 307; Eric Sandweiss, *St. Louis: The Evolution of an American Urban Landscape* (Philadelphia, PA: Temple University Press, 2001), 212-19.

[23] Lovelace 7; St Louis, City Plan Commission, *A Public Building Group Plan for St. Louis* (St. Louis, MO: Nixon-Jones Printing, 1919), 5-7.

[24] St. Louis Heritage, "Physical Growth of the City of St. Louis," http://stlouis.missouri.org/heritage/History69/, accessed May 5, 2004.

[25] Sandweiss, 221.

[26] "Old Public Buildings of St. Louis, Jan. 8, 1939," scrapbook, Missouri Historical Society Library, St. Louis, MO.

[27] Norbury L. Wayman, *Kiel Auditorium: A Half Century of Civic Service*, photocopy, 14.

[28] Advertisement, ca. 2000, Kiel Center, St, Louis, MO.

[29] "Municipal Auditorium and Community Center Building Plan, 1932-35; set E Com. No. 2, sheet no. 13, Mar. 15, 1932, reel 16, St. Louis Public Library, St. Louis, MO.

[30] Sigfried Giedion, *Space, Time and Architecture* (Cambridge, MA: Harvard University Press, 1967), 838-40; Vincent Scully, *American Architecture and Urbanism*, rev. ed. (New York: Henry Holt, 1988), 164-71.

[31] Blackall celebrated the contemporary tendency of clients to sometimes award jobs to the highest bidder. See his "American Architecture Since the War: A Decade of Development," *American Architect* 133, no. 2536 (Jan. 5, 1928): 2.

[32] "Memorial Auditorium Anniversary Supplement," *Worcester Sunday Telegram*, Aug. 31, 1958, H2-4.

[33] "Rhode Island Auditorium Great Civic Asset," *Providence Magazine* 27, no. 3 (Mar. 1926): 144.

[34] R. Maxwell James, "Memorial Auditorium," *Empire State Architect* 11 (Jan.–Feb. 1942): 5-9.

[35] Symons, 44.

[36] See Frank H. Taylor and Wilfred H. Schoff, *The Port and City of Philadelphia* (Philadelphia, PA: Local Organizing Commission for the XIIth Conference, 1912), 129-33.

[37] Sandra L. Tatman and Roger W. Moss, *Biographical Dictionary of Philadelphia Architects: 1700-1930* (Boston, MA: G. K. Hall, 1985), 418-21.

[38] *Philadelphia Municipal Auditorium* (Philadelphia, PA: Office of the Mayor, 1931), n.p.

[39] See Jim Gallagher, "$800,000 Worth of Arena – and Men in Case," *Philadelphia Record,* May 12, 1939, 20. The proposed reconstruction did not occur.

[40] Eugene C. Zachman, ed., *The New Municipal Auditorium*, *Kansas City, Mo*.(Kansas City, MO: Fratcher Printing, 1936), n.p..

[41] John Belle and Maxine R. Leighton, *Grand Central: Gateway to a Million Lives* (New York: W. W. Norton, 2000), 48-52.

[42] Kansas City Star, Dec. 1 1935.

[43] See *Artificial Light and its Application* (Bloomfield, NJ: Westinghouse Lamp Division. 1940).

[44] Means, 10-11.

[45] Elliott Willensky and Norval White, *A. I. A. Guide to New York City*, 3rd ed. (San Diego, CA: Harcourt Brace Jovanovich, 1988), 712.

[46] Edna Trull, *Municipal Auditoriums* (New York: Municipal Administrations Service, 1931), 19.

[47] Leila Y. Hamroun, "Historic Atlantic City Convention Hall Auditorium: From White Elephant to Billboard Magazine #1 Hit," in *Preserve and Play: Preserving Historic Recreation and Entertainment Sites; Chicago IL. May 5-7, 2005, Conference Abstracts* (Northbrook, IL: Wiss, Janney, Elstner Associates, 2005), 69.

[48] J. Rosemary Peralta, Project Manager, Michigan State Fair, to author, July 3, 2002.

[49] E.g., John M. Parker Agricultural Center, Louisiana State University, Baton Rouge (Edward F. Neild, 1930-33); Barton Coliseum, Arkansas State Fair, Little Rock (Erhart, Eichenbaum & Rauch, 1948-52); Hirsch Memorial Coliseum, Louisiana State Fair, Shreveport (1952-54).

[50] St Louis Building Arts Foundation, http:// buildingmuseum.org/llibrary/wood/asp, accessed Des. 21, 2004.

[51] Dan Cupper, *75th Farm Show: A History of Pennsylvania's Annual Agricultural Exposition* (Harrisburg, PA: Pennsylvania Historical and Museum Commission, 1991), 37.

[52] Amy DeLong, Manager of Pepsi Coliseum Ice Operations and Skate Shop, to author, July 1, 2002.

[53] See Design and Construction of Building Exits (Washington, DC: U. S. National Bureau of Standards, 1935), John J. Fruin, "Crowd Dynamics and Auditorium Management," *Auditorium News* (May 1984), www.iaam.org/CVMS/IAAMCrowdDyn.doc, accessed Mar. 28, 2007; Paul L. Wertheimer, *Crowd Management: Report of the Task Force on Crowd Control and Safety* (Cincinnati, OH: City of Cincinnati, 1980), 1, 49, 51.

[54] Judith Singer Cohen, *Cowtown Moderne: Art Deco Architecture of Fort Worth, Texas* (College Station, TX: Texas A & M University Press, 1988), 128.

[55] International Association of Auditorium Managers, *Auditoriums and Arenas: Facts from a Survey* (Chicago, IL: Public Administration Service, 1961), 88.

Chapter 6

URBAN AGENDAS AND ORGANIZATIONAL OBJECTIVES, 1945-1968

Postwar Context

In 1949 the American Society of Planning Officials (ASPO) published a report designed to be used by city officials engaged in planning for new entertainment and meeting venues. *Municipal Auditoriums and the City Plan* placed the auditorium within the environment of the civic center, whose nature was in fact mutable. The civic center of the first half of the century was an assemblage of municipal departments envisaged and built as a representation of community pride. After World War II, planners disengaged the auditorium from the classical ensemble in order to vest it with new values for meeting postwar urban challenges. This agenda usually required the facility to operate as an element of a larger commercial equation tied to urban renewal efforts.

The report compiled construction and seating capacity data for 175 municipal auditoriums extant at the time of publication, together with advice to planners concerning the size of site; parking; and relation to nearby shopping, transportation, hotels, and

restaurants. The report made no comment on the commercial decline of the central business district, nor on the potential that decline held for the siting of future auditoriums on land condemned by the municipality, nor on the implications for auditorium construction of urban highway development and access. Yet the report was prescient in identifying the edge of the central business district as a favored location for new auditoriums.[1]

City managers wanted to make it new, differentiate, create destinations. New districts and striking visual landmarks seemed to facilitate the projection of image.[2] Paul Thiry's Seattle Center Coliseum (1962), marked by a low-angled roof draped over trusses, was a unique approach. More common were circular forms, sited in open space, and intended to replace or counter the old industrial or business landscape. Most larger municipal arenas built in the 1950s and 1960s were ovoid or circular.[3] The low arch remained as a budget alternative for smaller cities such as Manchester, NH, where the John F. Kennedy Memorial Coliseum was built in 1965.

After World War II, most of the buildings affiliated with the Arena Managers Association had been used for twenty years or less. Downtown shopping and entertainment districts retained appeal for the urban population even as plans developed for reconfiguration of the core areas. But by the early 1960s the performance of arenas built in the 1920s and 1930s was challenged not only by entertainment options delivered to the home by broadcast transmission, but by problems with parking, safety at night, reduced bookings, and declining public transportation. Facilities located at transportation nodes (e.g., Boston Garden) or in large entertainment complexes (e.g., Hershey Park

Arena) performed better. The independent property fronting a street (e.g., New Haven Arena) probably was struggling with deferred maintenance and an overall decline in appearance. Planners contrasted older commercial areas (where the independent arenas were likely to be located) with less dense, newer, "cleaner", redevelopment project zones.

Arenas constructed before 1940 dominated the roster of buildings attended by audiences until a series of new facilities began to appear in the late 1950s and 1960s. Management made incremental adjustments to the existing buildings in order to reach postwar families and capture a share of their sustained and increasing income.[4] Television, in place by the mid 1950s, disseminated the arena's live event. Most arena managements found space for television broadcast studios. Increased costs, as well as opportunities in the new entertainment environment, led operators to exchange trade information through a new directory publication[5] and seek new, and regular, attractions such as the games presented by the Basketball Association of America, founded in the summer of 1946.[6] Management modified the seating bowl to ease circulation. For example, new vomitories in the Eastern States Exposition Coliseum, added in 1946, facilitated crowd movement toward attendee services and attractions outside the bowl. The proprietors of Edmonton Gardens (Rollie Lines,1912; fig. 6.1) applied to its great gable end a curvilinear curtain wall, gaining some years of extended use before replacing the facility in its entirety.

With sponsors targeting an expanded entertainment audience, arena managers gained more influence in facility planning and operation. Hermann J. Penn's privately-published but landmark *Encyclopedic Guide to Planning and Establishing an*

Auditorium, Arena, Coliseum or Multi-purpose Building (1963) advised decision makers about a range of issues, from site selection and floor layout to electric connections and directional signs. The arena of Penn's era was a concrete-encased, steel-frame roofed structure with floor, seating, circulation routes. and offices. The building floor often was cast-in-place concrete, the walls stone, brick, metal, and glass, with rigid insulation. Interior partitions were made of concrete block and metal studs with drywall. Floor finishes varied, from vinyl tile or rubber to clear sealant over concrete. Much ceiling was exposed, though office space sometimes had suspended tiles. Smaller facilities often used a metal-based ceiling insulation, Aluma-Zorb being a popular brand. The building was heated by air handlers, radiators, fan coil units, and unit heaters using steam and hot water. Cooling to offices and public space was provided by a chiller plant. Exhaust fans ventilated the building. Floor, seating, and circulation occupied three-quarters of the building, with offices, mechanical, toilet, and custodial occupying the remainder. Concrete steps and sidewalk often surrounded the building. Foundation and framing were the significant components of total cost, together with lighting and power. Walls, roof, partitions, finishes and systems accounted for the remainder. Space definition and compartmentalization, encouraged by the fire code, created relatively larger sectors for attendees and administrators. Space for storage was generally scarce.[7]

Based on more than a decade of postwar experience, Penn's text and illustrations emphasized operational efficiencies and revenue-building service to attendees. Individual planners followed Penn's advice to greater or lesser extent. But the

fact of the book's publication indicated recognition of the arena's stature as a participating asset in the redefined urban setting.

Improvements to existing venues held little interest for municipalities or private developers. Increases in both suburban population and automobile ownership changed the landscape outside the city and reoriented its core. The street receded in importance, the artery prospered. City planners sought to build downtown by developing large entities on top of the existing street grid. In the postwar period the arena gained value in the urban environment because public policy included it in the investment formulas directed toward the rehabilitation of the central business district.

The roofed arena's transactional value, the work that it was expected to accomplish, became more complex when it was expected to act in the public realm and on land formerly occupied by structures condemned in the name of the public. The objective of private sponsorship was to generate revenue through the sale of event tickets. Public sponsorship generally included the expectations that the arena would return revenue but, more significant for the city, establish a substantial and anchoring presence. In the first half of the twentieth century an arena scheme with public backing was likely to have been an element of a civic grouping; in the second half, part of urban clearance and renewal. The integral relationship between arena and urban project tended to move arena design away from the rectangular production sheds of manufacturing, whose earlier value as visual symbols of prosperity had become depleted. Instead, arena architects used round forms to claim attention and assert originality.

The arena's capacity to participate in the development of the urban environment increased in a period during which the centrality of its live presentations decreased. Arena sponsor, designer, and manager sought to change the nature of the spectators' event-attending ritual. Upon approaching and finally penetrating arena space, the spectator began to focus less on arena floor activity, where sport or spectacle used to create the new, temporary world. Instead, the patron watched representations of the arena's activity, presented by electronic media, or acted on opportunities to yield value to arena management at concession stands.

Roof as Communicating Element

The arena, as a venue and as an accessible object of communications and information media, was subject to assessment by the public and by the professional community. The arena was on continual display, and solutions to structural problems did more than carry building loads to the ground. During the interwar period, developments in engineering created new opportunities for architects to use the technical solution as an element in creating a full program environment. For example, the concrete ceiling of the Hershey Park Arena in Pennsylvania of 1938, free of attached support elements external to the ceiling's surface, became part of the building's design envelope (fig. 6.2).[8]

At the center of space spanning in the second half of the twentieth century was the deployment of roof supports in tension, a system counter to dependence on the compressive forces of the arch. Such members could be thinner than those carrying compressive forces and would be assigned to do different work, thereby offering new

design options.[9] Moving from compression to tension, and advancing from the linear system of bridge suspension technology to the surface systems associated with tenting, architects found expressive possibilities outside the classical frame. Applied technology solved roof support problems in highly visible ways, attractive to clients interested in leveraging projects to accomplish institutional objectives.

Schemes for roofing theaters and other buildings with tensile elements were published and built well before the 1950s.[10] However, the critical, cable-based applications for roofed arenas occurred in that decade. A cable net, as a space structure, could provide both the internal fabric of a roof and, when installed, its own support. A cable under load could stabilize that cable net roof against the suction and flutter of wind pressure.

Matthew Nowicki (1910-1950) developed a surface system of tensile elements and placed them within a mathematical model to form the Livestock Judging Pavilion (Dorton Arena) at the North Carolina State Fair in Raleigh of 1949-53 (fig. 6.3). Nowicki's commission called for an overall site plan for the fairgrounds, an amphitheater, and an enlarged grandstand and exhibition building. The clients, according to William Henley Deitrick, one of Nowicki's collaborators on the project, wanted a pavilion that would advertise North Carolina as a progressive state. In the postwar period, public assembly architecture of the agricultural fair, as exemplified by the Michigan State Fair Coliseum of 1922 (fig. 5.24), for example, was considered archaic and in need of reinvention. North Carolina's ensemble had to be new.[11] Nowicki and Deitrick, with Severud, Elstad & Krueger engineers, found the building's volume by intersecting two

parabolic arches of reinforced concrete. Cables in tension resisted the compression of the arches. The cable net stretched over the area between the arches to form the roof.[12] The Dorton Arena, as it came to be known, was the one element of the commission to be built. The parabola already had been used to project a sense of advancement. Eugene Freyssinet's dirigible hangar at Orly Field (1916) housed a new transportation mode from which much was expected. Nowicki lifted Freyssinet's earth-anchored curve, doubled and planed it.

Nowicki's placement of the arena floor at the center of the intersection maximized the seating at the midpoints of each side. That was a favorable consequence of his design, but not a controlling objective. Nowicki's primary concern was to use the form of the parabola as a visual metaphor. In plan, the arena floor occupied the space formed by two parabolas beginning their extension into limitless space. By framing the arena in this way, Nowicki located his client's building and, by inference, the state of North Carolina at the center of a constructed universe.

Nowicki's approach influenced later buildings outside the arena realm, including Hugh Stubbins's Berlin Congress Hall (1958), and was developed further by others in a series of arenas sited in fields of automobile parking. Eero Saarinen's hockey rink for Yale (1956-59), sited in a more interventionist manner, was part of this development. To the casual observer, the roof systems of these buildings, if slouching and swooping, were as unexpectedly rigid as the tip of Claes Oldenburg's *Lipstick (Ascending) on Caterpillar Tracks* (1969; fig. 6.4) was surprisingly limp. Like

Oldenburg's monumental public sculpture, but entirely without irony, Nowicki's potato-chip arena took forcible possession of one's attention.

Arena as Agent of Downtown Renewal: Detroit

Central business districts were losing commercial tenants and customers. Government used public resources to address the aging and weakening core and enacted statutes to establish the legal foundation for urban redevelopment. The Housing Act of 1949 targeted the elimination of substandard housing by means of clearance of "slums". Federal urban renewal policy provided private developers improved city land at reduced cost. City officials anticipated increased tax revenues generated by the improved base. Project design often included arterial highway construction in order to facilitate regional automobile access to redeveloped office and retail zones in the central districts. The creation of the Highway Trust Fund in 1956 increased the fiscal capacity of all states to build interstate highways.

After World War II, government's role in urban redevelopment, housing, and highway construction also created opportunities for arena proponents to build in or near downtown central business districts. The Housing Act identified removal of substandard housing as an instrument of urban policy. Clearance of areas in difficulty, coupled with federal subsidy of highway construction and the emergence of the private automobile as a dominant element in planning, changed downtown's spatial scale. Civic leaders from the private and public sectors tried to rehabilitate the business core by establishing new

facilities and providing suburban access to them. The Highway Act permitted private contractors to develop land acquired with public funds.

The removal of the apparently obsolescent street grid encouraged cities to envision and implement projects of public assembly and entertainment without reference to the limiting boundaries of the block. As a result, large projects proliferated. Sometimes the constituent elements of arena, exhibition, office, retail, and parking were physically connected; if not, they were usually in close proximity and sited for access from highways and major streets.[13] In company with world's fairs, most projects aimed at creating their own "complete" landscapes. Because the formal system required a variety of volumes or packages, the architect often specified a rounded form in order to both accent and bind the environment's boxy shapes. These conditions invited inclusion of an arena component.

Postwar planning theory invited radical change in the fabric of cities; action on a large scale was both dynamic and liberating. Prevailing opinion favored clearing irregular plots, broadening streets, creating highways and placing large building masses in large spaces. Perhaps, as Christopher Tunnard and Boris Pushkarev argued in 1963, the highway could be aesthetically pleasing if the straight road transitioned gradually to the exit arc.[14] But the main work of the highway brought the suburbs to the city, often to zones of massive rectilinear and curvilinear forms. Pittsburgh's was commercial and residential. Other cities employed the redevelopment process to revive the grouping of municipal administration, courts, libraries, and public assembly facilities. Existing arenas attracted some municipal interest for their potential to anchor large complexes and

superblocks of commercial uses. Planners assigned such roles, for example, to both Boston Garden and Chicago Stadium.[15]

In central Detroit, the zone formed by intersection of street and river attracted developers' attention. In 1890 Detroit's mayor proposed siting a group of civic buildings at the city's riverfront. Project realization followed a deliberate pace. With sponsorship from the American Institute of Architects, Eliel Saarinen in 1924 envisioned the construction of municipal offices at the foot of Woodward Avenue. The Detroit City Plan Commission began a master plan in 1941. As part of this process, the Common Council selected in 1944 a ten-block site at the foot of Woodward Avenue for a cluster of public buildings. This Detroit River site, occupying 47.5 acres between industrial areas, would accommodate a war veterans' memorial, government administration buildings, convention facilities, and a public auditorium. At the instigation of one of Eliel Saarinen's students at the University of Michigan, and on the recommendation of the Detroit chapter of the American Institute of Architects, the city in 1946 engaged Eliel and Eero Saarinen to develop the arrangement of buildings and to review individual building treatments.[16] The assignment for Saarinen, Saarinen and Associates was to provide physical facilities but also to "manifest in steel and stone the dynamic drive characteristic of this great metropolis" and to project a "show window" of Detroit.[17] The Mayor, Albert E. Cobo, needed the Saarinens and community, business, and professional leaders to address transportation, traffic, parking, redevelopment, stabilization of property values, the relationship with suburban communities, and, as a specific charge, establishment of a convention hall and exhibits building.[18]

The Saarinens' initial design of 1946 provided a cleared plaza gated by administrative buildings on either side of Woodward Avenue (fig. 6.5). A convention hall dominated the axial composition. Eliel Saarinen, working with Edmund Bacon, had included a fan-shaped cultural center to counter the rectilinearity of his plan for Flint, Michigan, in 1936. Such a juxtaposition of shapes appeared in the work for Detroit, as well. The deployment of large, relatively simple forms in space, free of nonconforming uses and "disorderly compactness," reflected his urban design philosophy. Yet he criticized what he termed the "thoroughly unimaginative civic center type" of axis-based planning.[19] The Memorial Plaza development in St. Louis, with the block-like Kiel Auditorium (1934) fronting its main axis, represented a tradition that Saarinen considered outdated and ineffective. For Saarinen, decentralization and organization into functional concentrations of related activities answered the need of the decaying urban body.[20] In that sense, his approach retained the earlier conception of scale but filled the cleared space in a way dependent upon the balancing of different shapes. Saarinen's search for form, consonant with the city's aspiring to renewal, sought the creation of large units of space, within which he placed buildings related in purpose.[21] The design and placement of a roofed arena, newly conceived by the Detroit redevelopers as a civic element with commercial potential, became part of Saarinen's means to realizing his urban objective. The plan published in October, 1946, marked by the convention hall's change from rectilinear to circular form (fig. 6.6), served as the basis for the model displayed in 1949 at the Detroit Institute of Arts and the J.L. Hudson department store (fig. 6.7).

Hudson's then took this Civic Center idea and transformed it into a suburban shopping mall. Indeed, the design for Hudson's Northland (opened 1954; fig. 6.8), Victor Gruen's first large center, had characteristics recognizable in Detroit Riverfront planning: superblock organization of rectilinear forms around one dominant curvilinear form, highway node location, pedestrian and vehicular separation.

The circular arena, useful to the Saarinens as external formal counterpoint within the plan, was not extensively studied for its internal design, though contemporary information indicated it was prepared to receive 17,500 spectators.[22] The Saarinens were providing here a municipal counter to the privately-owned Olympia Stadium (C. Howard Crane, 1927) on Grand River Avenue, a cavernous brick structure the city had designated for replacement by residential housing. More likely, the circular form fit the Saarinens' construction of an ordered world for the Civic Center, one that they continued to protect during planning.[23] However, as the project developed, accommodation for trade shows, consumer exhibitions and parking became dominant. Automobile shows, particularly, required extensive floor space. The convention hall became complementary space to a vast exhibition hall and parking deck (fig. 6.9).

These problems were also explored in other cities, too. In Cincinnati, for example, the proprietors of the privately-owned Cincinnati Gardens were opposing an effort by the Cincinnati Convention and Visitors' Bureau to build a downtown municipally-financed convention building. But Cincinnati was losing convention business because of the inadequacy of the Gardens' space for commercial exhibits.[24] Pittsburgh's leadership equivocated about space for exhibition and designated

surrounding areas for parking. Detroit's plan gave primacy to exhibition accommodation and provided parking within the facility. In later years, in New Haven, Kevin Roche, in his Veterans Memorial Coliseum (1965-72; fig. 6.10), placed parking even closer to the center of the composition. Essentially, he filled the space underneath the arena's roof truss with automobiles. Floor and seating received less attention. The seating ranks were pinched between the garage supports. Putting parking in the air eliminated resources for developing the decorative program, including contemplated tile cladding of concrete surfaces.[25]

Giffels, Vallet and Gino Rossetti, associated engineers and architects, transformed the Saarinens' convention hall concept into a smaller, 10,000-seat facility for entertainment and assembly, encompassing the form of an open-ended oval.[26] The city wanted the "best and most modern design in acoustics, sightlines, lighting and air conditioning."[27] The facility, Cobo Hall (1956-60; figs. 6.11-6.13), could be used in conjunction with the exhibition hall or independently. Flexibility and relatively modest seating capacity made possible higher overall percentages of event attendance. The building could not replace Olympia Stadium in each of its functions, though the Detroit Pistons basketball team moved from Olympia in 1961. The nature of the new building was set in purposeful contrast with that of Olympia.

Under construction by late 1956, Cobo Hall's design contained visual features that indicated the architects' intention to affect the audience's experience of the space. The arena interior (fig.6.11) was a complete package of finished surfaces, as Olympia Stadium was not: floor and carpeted tier seating with red, blue, and gold

upholstered seats; cove-lit acoustical plaster ceiling hung below the roof supports; and rainbow-illuminated decorative panels positioned at the arena's open end. The lower panel, a magnified abstraction derived from the shape of tiered seating, appeared to float. This panel was imposed on everyone's view and provided a proscenium-like focal point for stage shows and a surface for projection of color effects. The arena's stage was integral to the whole; its frequent use (several times each week during the initial years of the facility's existence[28] did not force the masking or relinquishment of seats. The architects positioned the seating bowl's lateral U-shape so that the stage would complete the open end. Management could, for example, book events using only the first tier and, by adjusting lighting in the upper tiers, reduce the apparent size of the interior, creating the impression of full capacity attendance.

The arena exterior projected the business community's desired dignified city image, a face of dark green slate and gray granite, aluminum and glass panels, and marble piers. It was the corporate variant of the circular public pavilion of the period, capable of appearing in varied contexts from public administration (e.g, the New Jersey Turnpike Authority administration building, Woodbridge, NJ, ca. 1965) to fair exposition (e.g., United States Pavilion, Brussels World's Fair; Edward Durell Stone, 1957-58). The City of Detroit, through the efforts of its Report and Information Committee, distributed photographs designed to situate the arena within a technologically advanced corporate world. One image presents an ordinary workman managing an apparently complex arena and exhibition hall building control board (fig. 6.12); another, community leaders

celebrating the realization of the Civic Center project, with the arena positioned by the photographer at the point of emphasis (fig. 6.13).

The civic center retained in Detroit its 1920s definition as an assemblage of buildings dedicated to providing administrative, cultural, and commemorative services to a city's population. In other situations, the arena retained the civic purpose of a center for relaxation, entertainment, and recreation without attachment to a larger complex. Whether constituent element or independent facility, the arena often acquired the commemorative function of war veterans' memorial, frequently barrel-vaulted, through about 1960, as, for example, the Onondaga County War Memorial, Syracuse, NY (Edgarton & Edgarton, 1950-51; fig. 6.14). The Syracuse War Memorial was a later entry in the series of thin-shell, concrete-roofed structures. The arched main spaces and side entrance followed Washington, DC's Uline Arena (1940-41; figs. 3.28-3.29), but with the addition of a monumental entrance built of light brick at one end and an external housing for theatrical fly space at the other. The architects used the entrance pavilion to mitigate visually the lowering effect of the arch and to provide a principal interior path. Attendees moved through corner extrusions to the functionally dominant side concourse. The Syracuse building shared the configuration of monumental entry pavilion and corner passageways with Buffalo's Memorial Auditorium (1938-40, fig. 5-17).

Pittsburgh: A Case Study

The situation in Pittsburgh epitomized the post-World War II development and bears closer attention. The city's educational and business community used federal

urban policy and its own energetic commitment to remake much of the city at the time. The Civic Arena (James A. Mitchell and Dahlen K. Ritchey; Ammann & Whitney; Robert A. Zern; Simonds & Simonds, 1958-61) was one of the principal elements of the new Pittsburgh. Its siting and design were calculated to accomplish specific objectives for the city: clear an area considered to be detrimental to the city, create a regional destination in support of the central business district, and provide a visible symbol of Pittsburgh's developing renaissance.

The project was not the first instance of the city's aspiring to accommodate indoor meeting and entertainment business. In 1925, with endorsement by Pittsburgh's newspapers, the Chamber of Commerce resolved to support construction of a public arena; and in 1928 the County of Allegheny budgeted $6 million for an auditorium. Both plans failed.[29]

Before the Civic Arena, Pittsburgh's active venues of this kind included Exposition Hall, whose availability ended in 1918; the East Liberty Market House (Peabody & Stearns, 1900) for trade shows, sports, and display of automobiles; and, in later years, Duquesne Garden, a converted street transit car barn near the Oakland district. The Garden, home to the Pittsburgh Hornets hockey team between 1936 and 1956, was identified in contemporary fire insurance mapping as a "Theatre and Artificial Ice Skating Rink."[30] The structure had a stone entrance, iron roof trusses, steel posts, and a partial monitor on the roof. Icemaking equipment was installed in the basement. John H. Harris, a Pittsburgh entrepreneur with influence that carried into the period of the design of the Civic Arena, was initially a tenant of the Gardens and later its manager. He owned

the Hornets, signed Sonja Henie to performance contracts, conducted business with the founders of the Ice Follies, proposed the creation of the Ice Capades, and, with other arena operators seeking attractions to play their buildings, created the Arena Managers Association in 1940.[31]

The long development of the Civic Arena project is best considered as part of the larger redevelopment process that began in the 1930s but accelerated during the war and after. The presidents of the Carnegie Institute of Technology and the Mellon Institute, together with Richard King Mellon, established in 1943 the Allegheny Conference on Community Development. This body brought together business leaders to identify issues they recognized as important for the city's postwar development. Pittsburgh's business community leaders understood that the planning and data collection work of technical staff and the cheerleading by elected public officials were necessary to the survival and development of the city's commercial center. Pittsburgh's planning apparatus was similar to that found in other cities of comparable situation: the city's planners, operating within a state legislative act and recognizing regional factors, generated property inventories and developed master plans for land use, highways, transportation, and recreation. This planning was forwarded by the 1949 law, which funded project studies, made loans, and provided public grants to facilitate private development.[32] But the larger process of directing public powers and resources in support of economic vitality was undertaken by a nonpartisan, overarching group incorporating the heads of Pittsburgh's principal institutions. Such an "expediters" group, representing

a partnership between private enterprise and local government, it was felt, could spur the attack on the city's problems. The Allegheny Conference set the agenda for Pittsburgh.[33]

In 1945, the 300-acre triangle of land at the confluence of the Allegheny and Monongahela Rivers was still the community's center of activity. Yet the capacity of the Golden Triangle to sustain that role in the postwar period was perceived to be limited by the presence of the outdated and physically deteriorated infrastructure of nineteenth- and early twentieth-century water and rail transportation. There had been little major office building construction since the early 1930s, assessed valuation diminished by more than one quarter between 1938 and 1947, and the downtown's share of the region's retail sales was declining.[34]

Pittsburgh's leadership had long wanted to facilitate regional access to the downtown business district. A 1926 city planning report proposed building a cross-town thoroughfare at the eastern edge of the Triangle.[35] In 1934, Edgar Kaufmann, department store owner, business community leader, and architectural patron of Frank Lloyd Wright, invited Wright to advise the city on making improvements to roads, wharves, and bridges. In 1939, Kaufmann became chair of a new committee of the Regional Planning Authority to study and promote capital improvements in the Triangle. In that year, too, Robert Moses completed a highway study for the Authority. His *Arterial Plan for Pittsburgh* recommended constructing a new system of highways around the Triangle which, in turn, would connect to the surrounding counties. City bridges functioned as connectors to highways. All of this thinking recognized the private automobile as the

principal means of downtown access and private investment as the key to the Triangle's survival and improvement.[36]

Edgar Kaufmann's standing in the business community and his service with the Urban Redevelopment Authority and the Regional Planning Authority, coupled with his personal commitment of time and money, allowed him to press a cause for which he had particular enthusiasm and in which the public had an interest.[37] The Pittsburgh Civic Light Opera Association needed a dedicated performance venue. In the 1940s the company played its summer dates at Pitt Stadium and suffered considerable financial losses from each rained-out performance. Abraham Wolk, a Pittsburgh city councilman and fellow enthusiast for light opera, was familiar with the reconstruction of the St. Louis Municipal Theatre's open air facilities, completed in 1939 (Murphy & Wischmeyer).[38] With the assistance of the Public Works Administration, St. Louis had erected a roofed colonnade along the perimeter of its existing 12,000-person open amphitheater. The Muny, situated in a city park, was an open-air venue offering some protection from weather. These attributes, more than the specifics of the design, indicated what Wolk wanted for Pittsburgh, as the facility began to be discussed in 1946. At that time, he proposed its distinguishing feature, a retractable roof.[39] Wolk's roof had no building, site, or sponsor.

Yet Wolk's vision of the roof's special capability persisted through years of subsequent discussion. A movable roof, however it was to be achieved, would display Pittsburgh's accomplishment in precision engineering. The novelty appealed to Mayor David Lawrence. "We should be very reluctant to surrender the idea of a movable roof,"

he noted during design discussions; "it will be heralded the length and breadth of the world." Wolk hoped the facility would be the "eighth wonder of the world."[40] The city was emerging from decades of problems with flood and industrial smoke and was confronting the more recent challenge of declining economic performance. Pittsburgh's leadership groups were attracted to the market potential of a new public facility with a strong distinguishing design feature. Mayor Lawrence, a "do it now" manager, wanted to develop as much as he could as soon as he could.[41]

Edgar Kaufmann shared Wolk's views about the nature of the roof on a future light opera facility, and he was in a position to forward such a project. In 1946 Kaufmann arranged for Frank Lloyd Wright to present to the Allegheny Conference ideas for a civic center to be located at Pittsburgh Point at the confluence of the rivers. Kaufmann paid Wright's fee for the further development of the ideas, which included Kaufmann's request for an arts center to include a 10,000-seat enclosable amphitheater.[42] Wright's plans presented Point Park as a regional destination for automobiles. The "Cantilever Development in Automobile-Scale" or "Point Park Coney Island" consisted of a large circular building sited at a vortex of bridges and highways (fig. 6.15). Serviced by spiraling ramps, it enclosed a convention hall, sports arena, amphitheater, planetarium, and concessions. The building exterior, in offering no one primary view, was oriented to the changing perspectives of passing automobiles. The public venues appeared as domes distributed around structural supports and connected by platforms and bridges. Wright had not provided the requested separate outdoor roofable facility, describing his arena as an "undersky" facility, convertible for a variety of sports and circus as well.[43] On the

basis of sections and sketches, the indoor amphitheater was only partially studied. Placement within the whole is shown, but the seating bowl is indistinct, if present at all. Wright's placement of the amphitheater deep within the complex did not correspond to Kaufmann's vision of a freestanding venue. Wright was more interested in breaking up the concept of civic centers as classicizing arrangements of buildings, in the manner of St. Louis. He presented in this response a regional and multi-purpose civic center oriented to automobile access and commercial use.[44]

Kaufmann infused his business sense with a strong interest in community development, recognizing a responsibility of business and industry to forward the interests of the city in general and of its cultural development in particular. In his view, Kaufmann's Department Store gained by appealing to the public's appreciation of color and form through store furnishings and presentation and, in a larger sense, by associating the store with plans and events relating to the city's future.[45] Kaufmann's was not alone in expressing such interest. Downtown department stores elsewhere participated in this effort to maintain attention on the central city by associating themselves with exciting future plans for downtown. The 1947 "Better Philadelphia" exhibition, for example, was co-curated by Edmund Bacon at the Philadelphia Gimbel's. In the same year Kaufmann's hosted the "Pittsburgh in Progress" exhibition on one of the upper floors of its downtown store. The department store venue was the natural place to mount an exhibit expressing the city's interest in assuring suburbanites improved automobile access to downtown.

The architects Mitchell and Ritchey prepared the show, a significant opportunity for the firm.[46] The exhibition presented in drawings and models the main

elements of future Pittsburgh, including Point Park, Golden Triangle, Lower Hill, North Side, and South Side. It was an elaborate production featuring flowing rivers. The architects visualized in general form the composition of each project area based on contemporary discussion and the overall direction provided by Park Martin and Wallace Richards, advisors to Richard King Mellon. Point Park and Golden Triangle, relieved of rail facilities, were all now landscaped sites for office buildings, apartment towers, and civic structures. Lower Hill was envisaged as a cultural center with a separate convention hall or arena, symphony hall, and open-air amphitheater. Richards viewed Lower Hill as the connecting entity between the Oakland district and downtown. The center was rendered as an extension of downtown and as the gateway to an apparently infinite series of rectilinear slabs leading to Oakland (fig. 6.17). The arena appeared as a roofed sphere, the focal point of a mall-like forecourt beginning at the eastern edge of the Triangle and covering a planned Crosstown Expressway. It was the plan's principal built element. As a form and as automobile objective, the arena evoked Wright's arena in Broadacre City, the 1935 exhibition of whose model was supported by Kaufmann.[47] Mitchell and Ritchey's model amphitheater for the Civic Light Opera was rendered as a depressed seating bowl covered by a scalloped roof of flexible segments fanned out from a pivot. Behind the amphitheater a series of low office structures approached downtown. The model was published in *Progressive Architecture*.[48]

Wright prepared another scheme for Point Park in which the sports arena and amphitheater were eliminated and a dominant bridge configuration introduced. In a January, 1948, memorandum to Kaufmann about this second Wright proposal, Wallace

Richards suggested reinserting the Civic Light Opera's amphitheater at the tip of the Point. Kaufmann, disappointed by Wright's two responses but still wanting him to build for Pittsburgh and rating the outdoor amphitheater as his preference, asked him for that in March 1948, to the exclusion of the other elements present in the earlier plans. Kaufmann, acting counter to his own preference in this third request, dropped the movable roof feature. Wright had begun preliminary designs when Kaufmann asked him to stop work.[49] By that time, in mid-1948, the product of Kaufmann's parallel strategy for the light opera had taken hold of the public consciousness. By contrast, Wright's efforts received little circulation, even within the Allegheny Conference committee that had requested them.[50]

Ultimately, the Conference, through the Equitable Life Assurance Society as developer, created a world of steel, aluminum and glass just inside the Point State Park tip of the Golden Triangle (fig. 6.16). The cruciform office towers of Gateway Center (Eggers and Higgins, with Irwin Clavan, 1950-53) were placed within a landscaped plaza. Evocative of Le Corbusier's Ideal City for Three Million People (1922), Gateway established a node countered on the other side of the Triangle by the development of Lower Hill. In both situations, bridges and highways accessed isolated buildings in space, connecting secondarily with local streets.

Kaufmann, disappointed by Wright's Point Park proposal, placed himself at the center of the project's development. In early 1949 he pledged one-half-million dollars (later doubling the amount) for the construction of an arena, with an folding fabric roof, suitable for the presentation of light opera.[51] At that time, the question of site was not

settled, though Mitchell and Ritchey's 1947 envisaged placement of the facility in Lower Hill was a powerful suggestion. Kaufmann sought to expand the development parameter beyond the limited acreage of the Triangle in order to provide a better opportunity for a Light Opera facility to claim its own space and profile in the new Pittsburgh.

Mayor Lawrence recommended acceptance of the gift, and the Allegheny Conference offered to perform a site selection study at no cost to the city.[52] The architectural press cheered Pittsburgh's renewal plans by praising the auditorium's plastic umbrella together with the objective of eliminating industrial smoke and investing in expressways. Wright, fully bypassed, blasted "the big plastic circus tent hung on a big ugly concrete pole."[53]

After considering a park location, the city settled on the Lower Hill site.[54] It provided ample land and access from the new Crosstown Expressway. More important, a large public facility could anchor the area's greater development as a revenue-producing zone of the city. In a process repeated throughout the country, the city received a Federal guarantee of credit to buy property designated for demolition. The land was cleared and sold to developers at a subsidized rate intended to attract private investment.[55] In Lower Hill, the city (with the support of state and federal government, the Allegheny Conference, and private developers) replaced 100 deteriorated acres with commercial and public facilities and defined those elements as dramatic agents of the Triangle's expansion (fig. 6.17).[56]

Wolk and Kaufmann envisaged the retractable roof as a core function of the arena's principal role as the home of the Civic Light Opera. From the city's perspective,

the facility's roof configuration was attractive not primarily because it offered an open or closed environment for the performance of opera, but because it provided a closed, controllable environment for a variety of revenue-producing attractions. In early 1953, together with the Allegheny Conference, the city sought and received approval from Kaufmann to define the opera facility as an auditorium with a broader purpose.[57] John Harris, hockey team owner and promoter, pressed his case for accommodating the hockey fans in the new facility. Harris was successful because he brought a core group of pre-sold attendees.[58] The Public Auditorium Authority of Pittsburgh and Allegheny County, with Mayor Lawrence as Chair, emerged in late 1953 as the civic coalition empowered to build and operate the facility.

Pittsburgh's leadership expected the arena, along with other new facilities, to generate activity which would "neutralize" the continued growth of establishments in the suburbs.[59] The project's reapportionment of space underscored the radical change of scale brought by the arena to that part of the city, by means of its own footprint and by the access configuration it required. Of the total acreage, more than one-third was given to automobile thoroughfares. No other single element of use, including the arena, exceeded that proportion. The thoroughfares connected to the Triangle and to the depressed Crosstown Expressway, the latter exemplifying the recommended urban arterial highway of the period in its routing through an area which, having declined in value, would be subject to redevelopment (fig. 6.18).[60] The city expected the Expressway to give visual first impressions of the Triangle from its eastern border. The looming arena, visible at automobile speed from partially buried highways, marked this

approach.[61] The building's bulk and sleek modernity projected from a position outside the existing city grid. By the fall of 1954 the arena's distinguishing features and accommodation of opera and sport were established.[62] In September of the following year the Federal Housing and Home Finance Agency approved the plans for the Lower Hill project. The Mitchell and Ritchey firm received the arena commission (figs. 6.19-6.22). The architects placed the building within a triangular plot intended to represent the eastern boundary of the central business district. The building sat on a slope and required a platform to establish its position. A tenuous connection to downtown depended on roads bridging the depressed arterial (fig. 6.23).

The critical reception was mixed. One commentator observed that the building was "not grand," and that the site work did not redeem the situation.[63] The arena's immediate environment included reflecting pools and a landscaped esplanade between Centre Avenue and the main arena entrance facing downtown. The architects worked with the city's Park and Recreation Department to achieve a nominally green setting within a concrete expanse.[64] The stainless steel roof, with six movable and two fixed leaves, and supported by a box girder, was the Civic Arena's notable feature. The roof's novel mechanical features were developed to meet the building's programmatic requirements, as they were understood at the beginning of the project. The dome and bowl met to form a whole sphere, a powerful shape of universality not achievable by a seating bowl surmounted by a rectilinear wall and roof.

Dahlen Ritchey had had an encounter with auditorium design at the beginning of his career. His 1934 Harvard thesis presented a music hall memorial to

Stephen C. Foster. Ritchey placed the concert hall proper within a dome whose exterior shape described a curve comparable to the Civic Arena's profile, but encased within an elevation of stripped classicism. As partners, Mitchell and Ritchey had written about the difficulty of finding architectural expression for their age and of negotiating between academic classicism and modernist imperatives.[65] Ritchey included a hydraulic lift for the hall's orchestra pit, a feature present in Pittsburgh, as well.

At the time of the roof's design, the steel industry was preparing to market itself as a producer of a variety of products extending beyond standard mill output. Under increasing pressure from competitors in aluminum, concrete, and plastic, and from steel importation, the industry recognized the potential benefit of appealing directly to the consumer. An image of the gleaming roof appeared in the professional literature, together with the Barcelona chair of Mies van der Rohe and the stainless pots and pans of Raymond Loewy.[66]

The dome's profile was similar to that suggested by Wright in his cursory studies for spectacular venues within Pittsburgh Point Park (fig. 6.15). But dome sources and applications were widespread. The Pittsburgh building's declamatory purpose, to give form to its community's progressive trajectory, was attempted also by the earlier Dome of Discovery at the Festival of Britain in London (Ralph Tubbs and Powell & Moya, 1948-51). A form from the prewar period was part of the background of the Pittsburgh dome. The dome may be seen as an exemplar of the industrial design aesthetic cited by Walter Dorwin Teague in his book of 1940, *Design This Day,* and realized in Teague's own collaboration with York & Sawyer for the New York World's Fair of

1939. His United States Steel Building for the Fair's Plaza of Light (fig. 6.24), a visual motto of his creed and his world, is a sleek hemisphere with external truss support placed on the surface and painted blue. Teague argued for a fundamental redesign of the world, using masses free of embellishment. Drawing comparison with Brunelleschi's domed Santa Maria del Fiore in Florence, Teague equated the trusses with the Duomo's masonry ribs in their capacity to create rhythmic accents and support the major form.[67]

Teague, a member of the fair's steering committee, sought to present technology and industry as servants of civilization and democracy, with machine precision creating unity and serene harmony. He favored the scheme of forms, set in space, free from confusion.[68] The nature of Teague's project was consonant with Pittsburgh's desire to render newly visible the Golden Triangle, which, before redevelopment, was defined as a dense commercial sector given shape only by the gathering rivers. Pittsburgh's leadership, with the participation of highway planners and the Federal government, excised the unruly masses of small-scale commercial and residential structures in order to gain Le Corbusier's aesthetic of dominant, machined forms.[69]

Mitchell and Ritchey followed the trend of counterpoising spheroids and quadriforms as elements of large projects. The composition appeared in many different program environments. Eero Saarinen used such an arrangement at the General Motors Technical Center, Warren, Michigan (1948-56); as had Harrison and Abramowitz at Rockefeller University, New York (ca. 1956-58), and Central Intelligence Agency Headquarters, Langley, Virginia (with Frederick King, ca. 1958-1961) For Saarinen, the

rounded forms of water tank and styling auditorium complemented the horizontality of the other buildings to form, in Saarinen's words, a "spacious grouping".[70]

A geometric derivation without applied decoration, and interrupted only by the supporting girder on the side opposite the view from downtown (fig. 6.21), Pittsburgh's arena roof projected a vision of resurgence and pride, though the low dome also conveyed downward force.[71] Mayor Lawrence wrote in 1964:

> The city welcomes tomorrow, because yesterday was hard and unlovely. Pittsburgh likes buildings that glisten with stainless steel and aluminum, and it has little time for the niceties of architectural criticism when it compares what it gained with what it lost.[72]

The dome's streamlining differed from the attenuated forms developed by the railroads in the 1930s, yet these new products of the steel industry had the shared purpose of creating a dynamic public impression. Ralph and Edward Budd's Burlington Route Zephyr used streamlined form to suggest speed and victory in competition for transportation consumers. The Pittsburgh dome, essentially static despite its retractable roof, was a fixed point within a system of continuous automobile movement. The regional population converged on that point to transact its entertainment business. On the railroad and in Pittsburgh, steel attracted consumers in recovery from economic hardship and war.

The roof's design and functionality required group expertise. The Pittsburgh press assigned credit to James A. Mitchell.[73] Others, including Admiral Ben Moreel (Chairman, Jones and Laughlin Steel and head of the arena committee) and Moreel's

recommended roof engineer, Amman and Whitney, participated as well. Moreel had been Chief of Yards and Docks for the Navy and was familiar with spanning issues and fitting large spaces with motorized enclosures.

Six leaves moved on rails along a ring girder of reinforced concrete; two were stationary. The movable leaves, fitted with neoprene to achieve sealing, rested on top of the stationary ones in open position. When fully nested, three-quarters of the facility opened to the sky. Civic Light Opera seating concentrated in the area underneath the fixed leaves, facing the stage and the city beyond. A curved box girder with end pivot, positioned to be masked by the dome when viewed from the downtown side, allowed the leaves to move. This cantilever frame was anchored by a concrete ring girder. Reinforced concrete frames supported the ring girder from the ground. Each roof leaf was pinned to a clevis which delivered the thrust to the cantilever.

The dome of 415-foot diameter created the building's volume. Not masked by supporting steel work or elaborate rigging grid, the roof interior was part of the attending public's visual experience. The dome communicated stasis, protection, and creation of environment for the activity within. Its off-white surface of acoustic panels was interrupted by dark squares of inlaid lights. Contemporary reports mentioned the red padded seats and gray-, yellow, and white-tiled concession stands, but likened the roof interior to a planetarium.[74] The architect's color choices were subject to approval by the city's fine arts commission.[75]

The dome read as a closed form, in contrast to the open volume of Daniel Burnham's carriage concourse in front of the nearby Pennsylvania Railroad station and

office building (1898-1901), where the entrance canopy spreads to welcoming arches. Yet, for the viewer from outside, there was promise of wonder held within. The seating bowl appeared as a continuation of the internal form defined by the great sphere, but, unlike in many circular buildings (e.g., Dallas Memorial Auditorium), the seating plan itself was oblong and afforded better views (fig. 6.22). A concourse led to upper and lower seating tiers. The arena sat about 11,000 for hockey and basketball, 6,700 for the Civic Light Opera. Placed within the sphere, the rectilinear format of the playing field determined the essential shape of the seating. The sphere did accommodate an additional tier of seating above the long sides, the architect wishing to maximize the number of good seats.[76] One section of seats lifted hydraulically to form a proscenium for the stage beneath. The arena offered exhibition space on the lower level, along with locker rooms and mechanical storage. The exhibition component, given separate accommodation in Detroit, for example, was not emphasized in spite of its potential to generate revenue. Its size and semicircular shape prevented it from becoming a significant operational asset.

By the end of the 1960s, the Civic Arena was established as a successful sports venue. Its performance as a multi-purpose facility was less strong. The movable roof was used sparingly; its main tenant, the Pittsburgh Penguins hockey team, had no need for it. The movable leaves complicated installation of necessary rigging. The Civic Light Opera moved out after several years because their concerts could not be heard well enough in the arena's open position.[77] The programming flexibility afforded by the roof lost relevance. Although there had been no local questioning of the roof's special features, the Allegheny Conference enjoyed the national acclaim generated by the roof.[78]

In the decades following construction, the Civic Arena and neighboring high-rent apartments and hotel continued to inhabit a downtown borderland, separated from the central business district by a roaring expressway whose isolating potential had not been transmitted by the drawings and models.[79] Retail development along streets leading from the Triangle to the arena did not achieve the desired physical and pedestrian link. Regional highways, which were not buried to the degree originally planned, held a much stronger connection to the arena than did streets leading to downtown.[80] In fact, the connections to the arterials confounded the Civic Arena's downtown approaches by forcing upon them the highway's curvilinear geometries.

The Allegheny Conference and the city worked to locate projects in Lower Hill, defining the Civic Arena as the anchoring entity, representative of the region's considerable investment. The Conference viewed Lower Hill as a potentially generating force of linkage from the Triangle and connecting with Upper Hill and eastward to the educational and cultural center of the Oakland district.[81] An arts center funded by the Heinz interests did not materialize. The city wanted to build a stronger bond between Lower Hill and the Triangle by encouraging retail development between the two areas and enhancing the visual linkage between the arena and Richardson's Court House.[82] Little of this happened. William Zeckendorf and Ritchey met with I. M. Pei, but Zeckendorf's firm of Webb & Knapp could not follow through. The black community developed a stronger voice in planning for the area and opposed additional clearance.[83]

Postwar planning in Pittsburgh considered the Golden Triangle as a tripartite form: Point State Park at the focal point of the rivers' confluence; the central business

district of renewed corporate health and retail activity, bounded by arterial highways on all sides; and the eastern front, marked by the Civic Arena and its intended collateral development. Renaissance Pittsburgh was based on the revival of a competitive business sector where physical fabric was a collection of corporate office towers. In contrast, the Civic Arena (analogous to Point State Park in its relative position to the central business district) developed a symbolic identification as a notable building of the new Pittsburgh. The Pittsburgh example aligned fully with Alexander Doxiadis's view of desirable urban formal synthesis based on clusters of rectilinear and curvilinear buildings in association (fig. 6.25).

The stewards of the Pittsburgh Renaissance placed the Civic Arena outside the congested city grid. Its retractable roof of stainless steel projected utility and progress. Situated on the edge of the city's business district, the Civic Arena was a product of a postwar effort to establish Pittsburgh as a regional destination for Western Pennsylvania, Eastern Ohio, and West Virginia. Promotion of regional assets was part of a larger strategy undertaken by Pittsburgh's leadership, designed to support the city's continued viability as a place in which to live and work in the period following World War II.

The Civic Arena's program extended well beyond providing a venue for the presentation of events. Its dome, the overwhelming formal characteristic, served the immediate function only sporadically. The local leadership exploited its gimcrack singularity while it could, featuring its image in planning documents together with the other favored landmarks: the bridges, Point Park fountain, Allegheny Court House and Jail, and the Cathedral of Learning (fig. 6.26). The novelty and utility of the retractable

roof faded after a few years, whereas the focus on serving the demand for presentation of professional sports increased. The cultural purpose intended by Edgar Kaufmann was subsumed by an entertainment application of broader appeal. The Civic Arena's sponsors, planners, and builders spent the building's urban leverage in its years of becoming. The building's enduring legacy was only the clearance of the landscape into which it was set.

Establishment of Urban Renewal Scale

The civic center retained in Detroit its 1920s definition as an assemblage of commemorative buildings dedicated to providing administrative and cultural services. Cobo Hall's integration within the ensemble released it from the responsibility of establishing project scale. Such expectation was present in other contemporaneous situations, notably in Baltimore and Providence.

The Baltimore Redevelopment Commission was established in 1945 but activity depended on the involvement of the private sector. Business leadership drove the development of the Baltimore Civic Center, beginning with the formation of a downtown partnership in 1954 and a regional entity, the Greater Baltimore Committee, the following year. The objectives were ambitious. Collectively, a federal administration building; office and retail space; theater; housing; hotels; recreational and dining facilities; sports arena; and parking were to bridge a gap between the existing financial and governmental centers on the east side of downtown and the aging Howard Street shopping district to the west.[84]

The city's planning staff had suggested only modest linkage between what they called the Civic Center, defined as a sector of primarily administrative buildings based at City Hall, and the shopping corridor (fig. 6.27). But the business community declared its preference for developing a series of parcels fronting Charles Street, the city's principal commercial thoroughfare. These parcels, to be brought together as Charles Center, would anchor the downtown and connect to supporting, revenue-producing elements.

Political and business leadership expected Charles Center's theater, office buildings, public plazas, and hotel to revitalize downtown Baltimore. By the time the Maryland General Assembly and Baltimore City Council established the Civic Center Commission in 1956, the Civic Center, now moved to the west and linked with Charles Street, had shed both its definition as a collection of municipal facilities and its contemplated location near City Hall (fig. 6.28). The civic connotation, removed from the domain of municipal management, was attached to a new project element. The Baltimore Civic Center, whose construction was funded by public bond issues, was planned as a profitable venture for hosting sports, performing arts, trade shows and meetings. Promotional literature presented the building as the contemporary entry in a long series of city venues of public assembly, ranging from inns and beer gardens to churches, community halls, and armories, especially the Fifth Regiment Armory of the Maryland National Guard (1901; expanded 1934). The new arena's footprint, contiguity and economic significance would support the development of Charles Center.[85] Site planning

for Charles Center emphasized elements of substantial size. The arena began the sequence.

Charles Center's modernist review board (Pietro Belluschi (MIT), Joseph Hudnut (Graduate School of Design, Harvard), and G. Holmes Perkins and David A. Wallace (both University of Pennsylvania) selected the design by A. G. Odell, Jr., for the Baltimore Civic Center (1961-63; figs. 6.29-6.31). The building was completed early in Charles Center's development, settling as a great white pad amid the small-scale verticality of downtown Baltimore. Odell dressed the box in attenuated metal forms derived from the visual heritage of industry and the contemporary design vocabulary of the space age. The roof treatment evoked the saw-tooth skylights of past industry (fig. 6.32) but in a translation already used to decorative purpose by Heinrich Rosskotten and Edgar Tritthart in the Rhein-Main Hall in Wiesbaden, West Germany, of about 1955 (fig. 6.33). The blank sides received a series of riveted aluminum strips. These tapering vertical shapes created a program of decorative framing and subdivision when applied to (or positioned in front of) the exterior surfaces of, for example, New York's Philharmonic Hall (Max Abramovitz, 1962); Yale's Beinecke Rare Book and Manuscript Library (Gordon Bunshaft, Skidmore, Owings and Merrill, 1962); and the Houston Astrodome (Wilson, Morris, Crain & Anderson; Lloyd, Morgan & Jones; Walter P. Moore & Associates; 1962-65). The sleek metal pattern had a progressive bearing and aligned with the city's developing view of its harbor basin area as a site for public attractions rather than produce storage and food processing. The aluminum used here was also a material of choice for space exploration.[86] The business community understood the

importance and popular appeal of the region's advanced technology industries. The Civic Center began to be built in the year of the merger of the Glenn L. Martin Company with American Marietta, creating near Baltimore the national center of design and construction for the Gemini program's Titan rocket.

The Civic Center provided an arena with permanent proscenium stage, exhibition space, banquet facilities, and meeting rooms. Following the example of Cobo Hall, the designer made visible each principal element within the main space. The exterior's tapered forms reappeared inside on the wall and ceiling surfaces. The sponsorship intended the stage to provide the venue with flexibility. Actually, it may have appeared awkward from the beginning, for, in fact, the stage reduced the building's seating capacity and injured the city's chances to attract professional sports franchises.[87] The bright lighting program used during sports competitions emphasized the stage's truncation of the seating bowl. The narrow concourse pitted concession customers against bathroom patrons. The operator was providing food as a customer service, not unlike its provision of sanitary facilities. Steps to the arena interior began in front of the vomitories, occupying floor space and impeding traffic.[88]

In Providence, a roofed arena was not part of the city's initial thoughts on rehabilitating the downtown but was added later by a contract architect performing site planning. Ultimately, the built arena established the scale for most later construction in the project area, a series of sites located near the state capitol grounds separated by railroad and highway rights of way.[89] The publication *Downtown Providence 1970*, the 1961 product of municipal staff work and local business, envisaged the Civic Center as a

complex of governmental buildings with a theater and museum. This plan stalled and was superceded by a 1963 study written by I. M. Pei and Associates and published by the Providence Redevelopment Agency. Pei's recommendations included an arena for 10,000 spectators as well as properties for office, residential, exhibition, and hotel use.[90] Pei had just emerged from years of collaboration with the developer William Zeckendorf, for whom Pei had specified placement of profitable enterprise on many properties considered fallow.

City government could not fund the entire package but favored construction of the arena. An arena offered to the strong mayor a symbol of progress for public consumption and a destination venue that offered good business. Mayor Doorley and Governor Chafee ordered a feasibility study, lost a statewide bond issue but eventually won a local referendum in order to move the project forward.[91] The owner of a regional bus line with an interest in downtown renewal helped by purchasing the Rhode Island Auditorium (1925-26) in order to remove it from competition with the new venue.[92]

The resulting building, the Providence Civic Center (Ellerbe Architects, 1971-72), asserted size and severity in the southwestern corner of a broad strip of development land stretched across railroad property near the capital (fig.6.34-6.35). Ellerbe's metal box was cradled by concrete braces and framed by concrete piers in a Brutalist scheme of hermeticism and repetition of forms. Braces, piers, and corner cuts provided a minimum of articulation. Inside, the scarcely perceptible roof pitch allowed the truss system no visual sweep and therefore no role beyond its essential performance of roof support.

The Baltimore and Providence civic projects depended on the substantial arena footprint to create scale appropriate to their objectives. The form could be relatively open, as in Baltimore, or closed, as in the locked compartment in Providence. Both arenas delivered to their contexts blunt instrumentality useful to the consummation of wholesale makeover.

Civic Center as Retail Center

In postwar Hartford, CT, consolidation of insurance companies and banks weakened the downtown as jobs and customers decamped to suburban sites or other regions of the country. The early relocation of the Connecticut General Life Insurance Company to a campus in Bloomfield and the establishment of Lord & Taylor and G. Fox in West Hartford reduced Hartford as a business center. Nevertheless, the commercial leadership, drawn mainly from the principals of the Aetna and Travelers insurance companies still headquartered downtown, took action. Envious of New Haven, its urbane if struggling neighbor, Hartford expected its Civic Center (Vincent G. Kling and Associates, Philadelphia; Harry Danos and Associates, Hartford; Fraoli, Blum and Yesselman, 1971-75; fig.6.36) to serve state, region, and city. The Hartford Civic Center would replace displaced sidewalk retail with stores of comparable scale oriented to new space created within the block.

First efforts in the 1950s, arising from discussions within the Committee for Hartford, concentrated on reorganizing components within the city using the block as the controlling measure. Working with the city's planning staff, Rogers, Taliafero & Lamb

produced in 1959 a plan for a progression of commercial buildings, retail stores, and arena trending westward from Main Street near the Connecticut River (fig. 6.37). The architect's use of the words "town center" to identify the arena site indicated not only an early indication of planners' intentions to place suburban shopping opportunities in a city center but a statement that arena attendees were good targets for retail transactions. The Greater Hartford Chamber of Commerce endorsed the firm's work in the following year and published it in 1960 as the *Renewal Program for Downtown*. The kernel of the sequence was built as Constitution Plaza (Charles du Bose, Hartford; Sasaki Walker and Associates, Sausalito, California, 1960-64.[93] A planned elevated platform of stores between Constitution Plaza and the arena site was abandoned as impractical. The proposed arena complex, which included at least three large and separate retail stores, occupied the block defined by Asylum, Ann, Church, and Trumbull Streets (fig. 6.38).

The public's 1959 narrow rejection of the arena only encouraged its advocates to persist.[94] At the time, developing interest in Hartford's relationship to its larger regional context resulted in a new wave of planning and discussion. The "Town Meeting for Tomorrow," held in 1964 and chaired by Aetna chair Olcott Smith, based its deliberations on an acknowledged interdependency of the city and the capital region.[95] The city fathers had little confidence in Hartford as a sports town but kept the arena project alive by voicing hopeful results for convention business. The facility would bolster the city's "evening personality," attract shoppers, frame the central business district by countering Constitution Plaza, and supply a performance and competition venue better than the Connecticut State Armory.[96] Arena property acquisition went

forward in the years of Constitution Plaza's construction and first years of use, a period during which the Plaza, as well as the clearance of a swath for Interstate Route 84, commanded the public's attention.

In 1969 Olcott Smith and others organized the broad coalition of the Greater Hartford Corporation but, just as important, provided the impetus for the formation of its implementation arms, Greater Hartford Process and the Greater Hartford Community Development Corporation. Greater Hartford hired James W. Rouse to develop scenarios of activity applicable to downtown Hartford. Rouse, a real estate developer and planner, had placed in 1958 one of the first enclosed shopping malls east of the Mississippi in Glen Burnie, Maryland, and had been working on creating the new town of Columbia, Maryland, financed by Connecticut General, since 1963. Rouse's study for Hartford, done via his American City Corporation, appeared in 1972 but surely was shared with principals well before publication.[97] American City Corporation envisaged the Hartford Civic Center as a mall site for shopping, entertainment, and business. The 1950s local connotation of civic center, the cluster formed by the Wadsworth Athenaeum, Hartford Public Library, municipal buildings and Prospect Street clubs, had long passed. Kling's Norfolk, Virginia, Civic Center (with Oliver and Smith, 1961-65) was just that kind of municipal group, arranged as rectilinear forms on a tight grid. But his ideas for Hartford were altogether different, at least in the beginning.

Kling's initial plans showed Rouse's influence. Kling positioned the arena as the focal point of a diagonal progression beginning at the main corner of the block. His angular concrete mass, comparable to the profile of Ellerbe Architects' Providence Civic

Center arena, allowed the arena exterior to participate in the studied irregularity of the landscaped common in the block's interior. Kling's evocation of "village green" afforded entrance to retail shops from the treed common in the manner actually implemented by Rouse, Richard C. Stauffer, and the Toronto firm of Murray and Fleiss in the retailing zones built within the Village of Cross Keys (1964) in northern Baltimore City.[98]

As built, the Hartford Civic Center, for which Aetna acted as co-developer, comprised four principal elements: a retail-office space in mall configuration, the arena, a hotel and a parking garage. Kling replaced the earlier oblique plan and its outdoor common with an interior arrangement better suited to managing convention business. His lowered seating bowl increased the retail space. Exhibition and assembly space was readily serviceable by truck and bus. The design represented a somewhat dour counterpoint to the open, depopulated landscape created by Constitution Plaza to the east. Kling stretched textured but otherwise blank concrete along the sidewalk to underscore his interest in building an internal environment for throngs of attendees from the suburbs. Lewis Eisenstadt of Kling's staff invited attendees to drive to the Civic Center, stay at the hotel, shop in the stores arranged along what the architect called "indoor streets," and see an event in the arena – all without venturing outside.[99] Though the arena was adjacent to, but not integral with, the retail offerings, the Hartford Civic Center represented a relatively early instance of arena management's strategy of encouraging discretionary spending by fans before, during, or after an event.

Sites Outside the Core

Building in the urban center still offered prestige location for public assembly but required significant financial commitment from supporting sponsors. Municipalities constructed where they could, sometimes using edge areas where earlier uses were ending. For example, in 1957 the city of Greensboro, N.C., purchased the county fairgrounds for erection of its entirely conventional War Memorial Coliseum (McMinn, Norfleet & Walker, 1959). The Coliseum's arched roof rose from within a low surrounding base. The emphatically non-urban site was part of the attraction. Over time, the city added ancillary facilities to the Coliseum's sector of the fairgrounds. Suburban culture, supported by the automobile, produced such site placements.

The illustrated cover of the 1965 volume of *Arena, Auditorium, Stadium Guide* projected the arena trade's vision for sponsorship, facility design, and marketing in the 1960s (fig.6.39). The image employed was an altered rendering of a photograph of the 1964 Mid-South Coliseum in Memphis, TN, a gathering place for the city's communities during a period of change in attitude and practice pertaining to race and integration. The sponsors built the Coliseum without the once-expected separate entrance for blacks. The cover, less progressive than the built fabric, depicted moderately affluent white families driving new automobiles arriving at, and leaving from, a shining, white, saucer-like enclosure.[100] The circus attraction was hinted at by the vendor's display board and by the foregrounding of parents and children. The circus provided arena managers

with considerable business after the war. Ringling Brothers had played Madison Square Garden beginning in the nineteenth century. Outside of New York, the show remained a tented circus until the 1944 Hartford fire brought to light unsafe performance conditions. But the big top persisted, even as Ringling experimented with outdoor performances and, in 1947, with inside dates at the Cow Palace in San Francisco, the San Antonio Coliseum, and the St. Louis Arena. John Ringling North ended the tented circus in 1956, declaring it "a thing of the past."[101] Promoter Irvin Feld understood before others the economic potential of placing the core elements of the disparate circus experience within the arena. The move indoors was coincident with the arena trade's effort to put families in the seating bowl and family entertainment on the arena floor. The sideshow and menagerie disappeared. The 1957 dates at the Charlotte Coliseum were financially successful. In 1967 Feld and Judge Roy Hofheinz purchased the Ringling show from the family interests. The complete alignment of circus and arena was underscored by Feld's staging the signing ceremony in the Colosseum in Rome.[102]

As rendered in the 1965 cover, the multi-purpose, curvilinear building stood alone in a large space free of restriction by street grid and without proprietary identification. The arena was part of the public realm and, in fact, was built with significant public investment. However, the public must pay to attend a variety of events. Arena managers no longer focused on creating or building up professional sports leagues or depended on maintaining relationships with monopolistic syndicates in order to attract spectators, as the operators had done with basketball and boxing after World War II.[103] By contracting for the cover illustration, the energized auditorium management

leadership attempted to persuade its own membership to revise its collective understanding of the arena form as the country emerged from the postwar period. Downtown municipal auditoriums and smaller privately owned arenas were challenged by suburban possibilities. But the industry was in fact conflicted. Some individuals associated with facilities operation continued to prefer downtown locations because of the potential spending by attendees at establishments near the arenas. Urban mayors, taking the same view, looked to the facilities to attract people downtown. In a speech to the 1960 Convention of the International Association of Auditorium Managers, de Lesseps S. Morrison, Mayor of New Orleans, cited the sports arena as a magnet for the downtown.[104]

However, development followed the population, and new venues were not likely to be sited along city streets, or continue to resemble factories, warehouses, office buildings or movie theaters. The new arena would command its own placement, be distinctive and appealing in shape, and not look like a three-dimensional projection of a rectangular playing field.

At an edge site, the arena's surrounding plaza provided acres of parking, sometimes connected to the arena by covered walkway, as in the Mobile, AL. Municipal Auditorium (Palmer & Baker; succeeded by Edward D. Slater, Slater& Slater; 1964). Architects of the period, if presented with a large plot outside a dense urban grid, turned to circular or elliptical designs. Though promoted by the trade as progressive, the curvilinear schemes did not always well serve the operational program which, increasingly, required the venue to house a variety of events. Building managers favored

the oblong configuration for its capacity to accommodate a variety of types of events and the simpler divisibility of ancillary space into rectangular rooms.[105]

The circular format impeded the presentation of events requiring a proscenium stage. Tom Parkinson, amusement business journal editor, facility manager, and cheerleader to the trade, encouraged his colleagues to accept the multi-purpose building but to press architects to design solutions to operational problems, such as finding space for storage and staging.[106] He felt that the architect could invade the showman's domain. At the same time, the public demanded more comfort and convenience. A 1966 survey of managers revealed the most common improvements to existing arena plants to be related to the buildings' heating, ventilation, and air conditioning systems and to parking.[107]

In the United States and Canada concerns for the continued viability of the downtown business district were broadly shared. Even as planning progressed for new downtown facilities associated with renewal projects, arenas constructed during the interwar period initiated their own renovation efforts in order to align with preference changes in the marketplace. For example, between 1964 and 1967 the Philadelphia Trade and Convention Center added substantial exhibition and meeting space to the complex west of the Schuylkill anchored by the Municipal Auditorium (Convention Hall) of 1929-31 (fig. 6.40). The Montreal Forum's 1968 reconstruction (Ken Sedleigh, fig.6.41) suggested that its owner's apparent embarrassment at brick and pitched roof caused the old building to be crated inside an obliterating blank box. However, activity external to

the central districts was increasing, and Cincinnati offered an early example of outward migration.

In Cincinnati, business interests established a facility without linking it to downtown renewal. Here, public and private sectors did not form a community of interest. The municipal authority indicated its preference for a downtown facility but could not follow through. The city's generally weak stance allowed private interests to dominate the process. In the 1930s, when efforts began, investors were clear about their overall orientation: "We wish to strongly insist that there is no desire on the part of this group to appear entirely in the civic or philanthropic light in this connection. We are convinced of the probable financial success of this undertaking."[108] The prewar project to build something "on the type of Madison Square Garden in New York" and connect it with city-owned exhibition space failed; however, business leaders revived it quickly after the war and pitched the project to the Ohio Valley community as a regional resource.[109] None of the sites considered by the investors was downtown, though the city's master plan called for a river location.

The city's planners wanted the building to spur redevelopment of Cincinnati's Basin and Riverfront: "An arena . . . is a must in future planning, but it will be wasted unless it is located on the downtown riverfront."[110] Such public statements, together with neighborhood opposition in other proposed sites, led one owner of riverfront land to offer his property to the city in exchange for leasing rights to an arena if built there. Vested interests in at least one possible site did not want an arena, fearing that increased traffic would hasten the decay of that neighborhood. These interests accused

the city of scrapping the plan if it allowed the arena at that site. A site at the Carthage fair grounds was also considered, with the thought that the arena's winter operations could complement the fair's summer activity.[111] But the federal government had not yet codified its partnership in urban renewal; therefore, no assistance was forthcoming that might have made a riverfront "bottoms" location attractive to the investors' group.

The proprietors' suburban site, eight miles north of the city, was characterized by the architects as occupying the "ideal median position" relative to the city's population. Here they would build a profitable entertainment venue. During the period, Sears, Roebuck identified many comparable sites for its postwar expansion.[112] The planning commission changed the zoning from Residence "B" to Business "A". The Mayor, on the City Council's passing the ordinance, told the sponsoring group "we are proud that private enterprise has done what the City of Cincinnati has failed to do these many years."[113]

The entirely privately-financed Cincinnati Gardens (A.M. Kinney; Max Bohm) opened in 1949. The multi-purpose building, a nightly destination for private cars, buses, and taxis, was the precursor of the suburban arena established widely in the 1970s, though its rectilinear form contrasted with the contemporary interest in circular buildings. The Gardens looked much like a postwar Sears, sited in a suburban parking lot, with an expansive plain façade and applied graphics. Spectators entered under a marquee framed by mounted concrete bas-reliefs of athletic figures. Vehicular access was crucial to successful operation (figs. 6.42-6.43). Two four-lane highways and several smaller roads gave access to the property. The newspapers defined this venture of private business,

which developed without municipal sponsorship, as a civic asset: "The building is the latest word in such construction. But it is more than that. It represents a faith in community development. The opening of the Garden is a definite sign that Cincinnati is going ahead."[114]

The buildings remained viable throughout Cincinnati's downtown renewal planning of the 1960s. The city's published plan provided for a convention center but no arena, indicating the Garden's success in meeting community needs and planners' preference for the convention center as a powerful renewal agent.[115]

Postwar Philadelphia's arena developed as a product of the relocation of the Philadelphia Phillies baseball enterprise after years of tenancy at Shibe Park, later Connie Mack Stadium, at the corner of 21st Street and Lehigh Avenue in North Philadelphia. Public and private will drove the establishment of new sports venues along Broad Street in South Philadelphia, south of a dense residential district. Beginning in the 1920s, the area developed a suburban quality within a boundary of rail lines and terminal facilities. The city reclaimed and graded 300 acres of marsh to form League Island Park. Eventually, the foot of Broad Street became something more than the entrance to the Philadelphia Naval Shipyard. Municipal Stadium, built for the Sesquicentennial Exposition of 1926, occupied a site along Broad just north of the rail connection to the Delaware River piers. After World War II, highway and bridge access tied the area to the swelling regional population, facilitating the development of regional attractions.[116]

In 1954, the Athletics baseball team left Philadelphia and Connie Mack Stadium for Kansas City. The Phillies remained under increasingly difficult

circumstances. The ballpark's seating capacity could not easily be expanded. It was far from highway interchanges and offered regular automobile parking nightmares and, by the 1960s, a reputation as a dangerous and depressing venue for fans. Richardson Dilworth, Mayor from 1955 to 1962, advocated municipal sponsorship of a new multi-purpose facility at the South Philadelphia location.[117] Philadelphia's interest in building a suburban destination inside the city (but apart from the city center) was shared by other municipalities. New York's Flushing Meadow Park (Shea Stadium) of 1964 and Washington, DC's District of Columbia Stadium (later Robert F. Kennedy Stadium) of 1965 challenged Philadelphia to establish a competitive facility.

The voters approved two bond issues, and ground was broken for Veterans Stadium in 1967. A joint venture of the Phillies, football Eagles and the city, Veterans Stadium occupied a site at the northern end of the South Philadelphia project area, balancing Municipal Stadium (John F. Kennedy Stadium) and inviting the development of a smaller parcel between them (fig. 6.44). In 1965 the National Hockey League announced its intention to expand. Ed Snider, a Washington, DC, entrepreneur, obtained a franchise for Philadelphia. At the same time, the National Basketball Association entry, the 76ers, expressed unhappiness with Convention Hall. Mayor James Tate recognized that private enthusiasms and dissatisfactions could be converted to what he considered to be to the city's benefit. Tate's deals with the winter sports teams enabled him to reduce the debt on Veterans Stadium by collecting rent from the arena's builders and owners for the land and parking lots.[118]

The scheme for the Philadelphia Spectrum (Skidmore, Owings & Merrill; Myron Goldsmith; Michael Pado; Albert Lockett; Tizian Associates, 1966-67; fig. 6.45) encased an unremarkable precast concrete seating bowl within a reinforced concrete frame and skin of glass and brick. The roof structure, worked out by Myron Goldsmith, employed steel trusses and joists in a web configuration. Goldsmith had worked in the office of Mies van der Rohe from 1946 to 1953, then studied with Pier Luigi Nervi. Goldsmith's particular interest was designing buildings of long span such as hangars for United Airlines in the late 1950s and the Oakland Alameda County Coliseum Arena (1966-68). Brick, the characteristic material of Philadelphia's nineteenth-century industrial achievement, was specified but made subsidiary to the system of surface divisions. A continuous, exterior plane curve dropped vertically from roof to pavement. The curtain wall, familiar as an expression of corporate elegance, was here applied to an arena program for the first time. Concrete mullions presented frames of vision to the exterior. These frames were filled with brick, the opaque, impenetrable material of Philadelphia's past, or with the illuminated view of the interior, Philadelphia's commercial, but non-industrial, present.

By this choice of presentation, management sought to eclipse the collective memory of the city's older venues by associating the new arena with the Philadelphia of Vincent Kling's Penn Center. In the 1960s arena sponsors and builders often pursued erasure and redefinition of form even while evoking the past, sometimes the deep past. Thus in 1959 Welton Beckett and Associates wrapped in blue metal the seating bowl and standard truss roof of the Los Angeles Memorial Sports Arena (fig. 6.46). The Forum in

Inglewood, CA. of 1967 (fig. 6.47), also located in the Los Angeles metropolitan area outside of downtown, was surrounded by a continuous canopy of attenuated column-like forms intended to both recall and supersede the Colosseum of Rome.

Connie Mack Stadium and the Philadelphia Arena at 46th and Market Streets had been identified with times past and losing teams. True, Convention Hall accommodated varied uses, and the Palestra hosted elite citywide basketball. Yet, Convention Hall's marble grandeur and the Palestra's factory form represented depleted value. In contrast, ownership and city presented the sleek Spectrum, whose anagrammatic name apparently derived from the words Sports, Entertainment, Concerts, Theater, Recreation and Relaxation, and Stadium. Built in fifteen months beginning in May, 1966, the Spectrum promised a world within. By day, the building was an opaque surface. By night, the visible interior became activated with movement. Inside, colorful chairs dominated the bowl which, in turn, determined the dimensions of the entire building. It was "tight." Seating began close to the arena floor. The cylindrical volume produced a bowl with relatively little splay, generating a narrow concourse. The roof, unseen from the outside, was supported inside by a network of latitudinal and longitudinal members. A scoreboard carried the only advertisement.

Site has influenced arena footprint from the earliest period of the building type's history. Postwar arenas designed for placement outside the downtown core often were generally curvilinear forms free from predefinition mandated by block and set within traffic flow-based environments. Wright failed to impress circling forms on downtown Pittsburgh, but that project's echo was realized outside the core. The potential

of regional markets developed as a determining factor in placement of new facilities. Technological innovation encouraged formal variety in roof shape and cladding and contributed to market appeal. Multiple architectures could accommodate multiple purposes; however, the relationship with the audience required cultivation.

Institutional Objectives on Campus

In the postwar period colleges and universities renewed and expanded facilities to meet new demand. Bradley University purchased and modified an airplane hangar. In Philadelphia, St. Joseph's University built Alumni Memorial Field House (Emile G. Perrot, 1941), a rectilinear gymnasium. State universities constructed large buildings.[119] Universities built arenas to strengthen institutional identity, as they had done after World War I. Brown University's Meehan Auditorium dome (Perry, Shaw, Hepburn & Dean; Nichols, Norton and Zaldastani; 1962) provided multi-purpose space and a notable shape. Variance from norms served the institutional objective of commanding attention.

The new collegiate arena could surprise by approaching, then veering away from, a familiar shape. Rupert Thompson Arena, Pier Luigi Nervi's barrel vault (with precast concrete units) for Dartmouth College (1967; 1973-75; fig.6.48) was visually arresting due in part to its parabolic, rather than circular, cross section. Nervi's presence was part of the European architecture community's publication and competition activity in the 1950s and '60s. The work appeared in new or revived professional publications reporting on architectural work in nations in the latter stages of postwar recovery, or on

the use of materials fabricated abroad in large quantities, which included steel. International awareness increased and influences flowed between North America and Europe as individuals, firms, and communities sought to design and build visually compelling arenas free of dependence on disguised industrial forms.

Roland Rainer's Municipal Hall for Vienna won the Council of Vienna's 1953 competition for the design of a multi-purpose sport, entertainment and recreation center. In section, the arena's profile was not substantially different from many contemporary large halls with transverse principal members. Rainer's external profile expressed no roof pitch but described in its roof line the essentially flat bottom chord of a standard truss (fig.6.49). Rainer's subtraction of a familiar visual element caught the attention of designers of large and small arenas constructed throughout Europe for specific international athletic competitions or for public recreation and spectatorship. A skating rink at Lyons of 1967 by Batton and Roustit took its form, as did the arena at the University of Dayton, Ohio (Pretzinger and Pretzinger, 1967-69).

In the 1950s some university presidents embraced modernist architecture as a corrective for the eclectic prewar campus. Operating with this conviction, A. Whitney Griswold encouraged Eero Saarinen's planning and design activity implemented at Yale in mid-decade.[120] Eero Saarinen's initial efforts at tensile construction happened in the 1940s. They included a radial, cable-stayed structure for a community center in 1941 and a tent for music performance in Aspen, CO, of 1949.[121] His commission to design a new hockey rink for Yale University (David S. Ingalls Rink, with Douglas Orr, Associate

Architect; Severud-Elstad-Krueger, Engineer; 1956-59; figs. 6.50-6.53) gave him the opportunity to explore the aesthetics of long spanning.

As Saarinen noted, "We have an urge to soar great distances with our new materials and to reach upward and outward . . . Our architecture is too humble. It should be prouder, more aggressive, much richer and larger"[122] In reference to his Kresge Auditorium for the Massachusetts Institute of Technology (1950-55), he observed "I feel now that the building is not enough of a lifting form."[123] Saarinen's interest in plastic form was a continuing theme in his work, from his figural sculptures of the late 1920s through Ingalls Rink, TWA Terminal (1956-62) and Dulles International Airport (1962). At the same time, Saarinen credited the Yale job with giving him the confidence to manage large roof applications associated with those later commissions.[124]

Yale had used the New Haven Arena of 1927, a small, commercial facility, for many years. By the 1950s, the situation had become unfavorable for the University. The Arena's management limited Yale's ice time, and the University wanted to withdraw in favor of a new facility of its own.[125] Yale awarded the commission in April, 1956, without any real idea about what Saarinen would produce. The University assumed that he would design a facility appropriate for the designated site, not at the athletic complex to the west of downtown but near the center of campus. The building was to accommodate not only hockey but large university gatherings and events, including graduation in case of bad weather. The arena would be sited next to important campus science buildings designed in the historicizing styles Yale traditionally favored but was abandoning under the leadership of President Griswold. With the support of the Yale

Corporation, Griswold welcomed contemporary work to the campus. His intention, "to trust the creative spirit and impulse of the greatest architects of our generation," allowed him to direct institutional attention and donor involvement to campus areas where future developments in academic program would require renewal of facilities.[126]

Saarinen's communicated to Griswold the hope for a "modest and neat space" respectful of its neighbors. But one of Saarinen's site sketches (fig. 6.51) revealed his tight focus on the placement and landscaping within the block. There was little or no reference to the existing built environment. Saarinen observed that he would be visiting some hockey rinks and "could hardly wait to get his hands and feet into the problem."[127] During the next months, Saarinen manipulated Griswold, succeeding in persuading Yale to increase the project budget: "The original figure would have given you only the simplest barn, and I feel convinced that such a structure placed so close to the permanent part of the Yale Campus would not have been in the University's interest in the long run."[128] The correspondence is characterized by a general dismissal of pitched and arched configurations. The revealed low arch of Bowdoin College's Dayton Arena (Barr, Gleason and Barr, 1956; fig.6.54) was the kind of shape Yale wished to avoid. Later public comments by Saarinen referred to "run of the mill barn-like or Quonset-type hockey rinks," thus reducing the existing types of pitched and arched forms to the denigrated classes of barns and Quonsets, respectively. Yale had erected colonies of Quonsets after the war for married student housing.[129] Earlier, in 1940, Saarinen had designed the barn-like Berkshire Music Shed at Tanglewood, in Lenox, MA..

Griswold, taking Saarinen's cue, used the same fear of barns in his letter to the donor, adding a pejorative reference to the facility used by Yale's rival: "The conventional style of hockey rinks seems to me so ugly and barn-like--witness the Harvard rink--that we all concluded it would be a mistake to put such a building on a site that will soon be developed as an integral part of the campus proper."[130]

One of Saarinen's sketches (fig. 6.52) revealed his interest in the potential of cable net roof support to fulfill the internal and external program and, combined with the qualities of reinforced concrete, to develop a formal language of roof design. The sketch demonstrated his awareness of the Raleigh work of Matthew Nowicki, his former Cranbrook Academy colleague, as well as his familiarity with the kind of support systems published in Frei Otto's 1954 book *Das Hängende Dach*.[131] The sheet's central image was a building with three cable net sections hung from two tilted arches; Otto depicted just such a configuration, as well as a single arch with a partially developed cable system (figs. 6.55-6.56).[132] At the bottom of the sheet, Saarinen included a smaller view of the central image from a different position; a cable net suspended from a single arch. The images are bold, contrasting with the later rendering of the project in which the building's domination of the site is mitigated by placement within a landscaped environment (fig. 6.51).

In order to work the technical solution as an aesthetic element, Saarinen modified the arch and net configurations to allow the building to meet the ground and push out and up. The thrust of the concrete arch's reverse curve cantilevers denied the arch's downward push. The roof itself, calculated for Saarinen by the firm of Severud-

Elstad-Krueger, was a network of pre-stressed cables suspended between the arch and walls.[133] The exterior walls acted as counterparts to the arch and took the lateral thrust from the cables that spanned between them and the arch. The cables were independent of the net and were included as a safety measure against roof flutter induced by wind.[134]

Inside, the lyre shape (fig.6.53) allowed Saarinen to increase desirable seating at the midpoint of the arena's length. View of play in the corners of the ice surface was unavailable to spectators seated at the far ends of the same side. On the order of the fire authorities, Saarinen's project designer added a plaster soffit around the perimeter.[135] Florescent lights hung from the ceiling to form a plane over the arena and illuminate the ceiling through spill. Concrete, ice and lights appeared to work in concert to create Saarinen's objective, a sense of luminosity within.[136]

The public reacted with enthusiasm.[137] Yale's History of Art faculty congratulated Griswold on Saarinen's solution of "the classic architectural problem of covering practically, and with visual effectiveness, a large enclosed space." The faculty suggested that a "really fine" group of science buildings "in the same idiom" could be developed around the building.[138] The modest seating requirement allowed Saarinen to plan essentially one level of spectator space, from which all else rose. The attendees' visual experience of arch and roof was unimpeded, even by the fully exposed air handling equipment suspended below the roof in each corner. Here, as with Nervi at Dartmouth, roof components and shape were visible and integral to the overall program.

Ingalls Rink developed independently of the pitched- and arched-roof traditions as well as the circular configurations then evolving, with Saarinen energizing

the pairing of cable net and concrete[139] The design functioned as an example for his use in design work for Dulles[140] and for close study by Kenzo Tange (with Koji Kamija and Urtect, and Yoshikatsu Tsuboi, Engineer) for the Yoyogi National Gymnasia in Tokyo of 1961-64 (fig. 6.57). The two buildings revealed Tange's acceptance of Saarinen's overall inspiration and, specifically, Tange's own interest in Saarinen's arched wall anchorages. In place of Saarinen's central arch, Tange used columns to fly the cables. In Ingalls Rink, Saarinen's entrance provided a central point from which lines of movement diverged. The arch sprang from its animate base as the spectators moved along the sides to their seats. Tange's generating node was a large sculpture at the comparable point in the larger of his gymnasia[141] Later deployment of the cable net included Frei Otto's German pavilion at Expo '67 in Montreal (with Rolf Gutbrod), where a masted net supported a synthetic roof membrane.

Saarinen's unicum could not provide a formal pattern for university administrators desirous of making a big splash with a new sports facility. The circular configuration, more accessible within the profession, was a popular option. It projected a bold, if closed, quality in contrast to Saarinen's rink, which opened at two ends. The Assembly Hall at the University of Illinois in Champaign (Harrison and Abramovitz; Ammann and Whitney; 1959-63; fig.6.58) was a closed form. But the arresting shape, dominated by a poured concrete dome resting on perimeter concrete held together by jacked steel tendons, conveyed to campus a sense of omniscience and modernity. Abramovitz's roof folds modulated the surface and tempered the monolithic effect[142]

In terms of the number of large campus facilities built (with spectator capacity of at least 10,000) the family of domed or drummed round or ovoid arenas constituted the dominant group in the postwar period (see Appendix). The flat truss or space frame and the arched form followed in number. Most smaller facilities were built in one of those modes. But for the big venues, program and available space drove the choice of form. Campus expansion after World War II enabled universities to erect the round or ovoid statement buildings, which required relatively large expanses of land in order to maintain proportionate setback from existing structures and roads. In contrast, the regular angles of the space frame and, to a lesser extent, the arched-roof building allowed them to be placed in closer quarters. Universities that placed their expectation in bulk and versatile, rectangular interiority were satisfied by the boxy gym.

Controlled Environment for Revenue Production

Hermann Penn's *Encyclopedic Guide* of 1963, the handbook for arena siting, construction, and operation, emphasized purposeful planning and establishment of clear objectives. If the arena was expected to sustain itself, if not produce net gain for the sponsor, management had to do more than use guest services to manipulate attendee behavior. For example, trying to protect concession sales by restricting the number of water fountains was a widespread but ultimately minor initiative. Instead, Penn argued, each element of built fabric and policy, from aisle width and turnstile placement to reduction of seating bowl size by temporary curtaining, should contribute to maximizing revenue and controlling cost[143]

The curvilinear or spherical arena projected an external appeal that overwhelmed practicality concerns. It seemed to be capable of accommodating multiple kinds of activities. Sponsoring groups with a mandate to serve growing regional populations, often outside the industrial Northeast, identified a powerful aspect in the coliseum form, already revived by Pier Luigi Nervi in his work for the Rome Olympics, including the elegant Palazzetto dello Sport (with Annibale Vitellozzi, 1956-58)[144] The businesses of professional sport and trade exposition were expanding into Sunbelt cities whose entrepreneurs were claiming sites to serve territories of marketing and influence. The example of Roy Hofheinz demonstrates how the act of bringing an outdoor sport inside established a promotional medium affecting city, region, and country.

The Houston business community wanted to bring major league baseball to the region. The Houston Sports Association sought help from Judge Hofheinz, whose biography suggests had been aware of the extensive press coverage of Nervi's work. In any event, Hofheinz's biographer reported his subject's moment of inspiration: "Standing there looking back on those ancient days, I figured that a round facility with a cover was what we needed in the United States and that Houston would be the perfect spot for it because of its rainy, humid weather.[145] Not coincidentally, Hofheinz had previously been interested in developing a shopping center enclosed for customer comfort.

Hofheinz's Harris County Domed Stadium, the Astrodome of 1962-65 (fig. 6.59), was a ramped and skylit, luxury-boxed entertainment dome set in a drained swamp south of Houston near regional highway connections. Lloyd, Morgan & Jones, Hofheinz's architect, knew about the difficulties presented by the Pittsburgh Civic

Arena's roof opening and closing mechanisms and rejected that model. The Astrodome's Lucite panels were intended to admit natural light but exclude nature. The Astrodome's greater revolution was the passive spectatorship and active consumption it sought to induce among event attendees, states of lesser involvement with the live presentation and greater orientation to the messages of communications media delivered to television screens throughout the stadium's clubs and restaurants. These aspects distinguished the Astrodome from domed venues erected in the recent past, including the otherwise comparable Palazzo dello Sport in Bologna (Rocatelli, Valle, and Allegra, 1956-57)

Rhetoric about size and primacy characterized the Astrodome's public relations. The sports or entertainment event taking place on the arena floor was the object of the attendees' distant view and imperfect understanding unless aided by audio and visual description. As a consequence, the spectator was likely to shift attention to the $2 million animated scoreboard or spend time in one of several smaller, comprehensible environments placed within the dome. Impressed by past and present example from Europe, but excited and inspired by the capacity of spectators to yield value beyond the price of admission, Hofheinz derived in Houston the first superstadium which, in turn, spawned the Louisiana Superdome (Curtis & Davis; W. Norman Nolan and Nolan; Edward B. Silverstein and Associates; Sverdrup & Parcel; 1967, 1971-75; fig. 6.60)

Madison Square Garden Center (Charles Luckman; Severud Elstad Krueger; figs. 6.61-6.65), occupying the western two-thirds of the site between Seventh and Eighth Avenues from 31st to 33rd Streets in New York, opened on February 11, 1968. Its name had long since lost its reference to specific Manhattan geography. Madison Square

Garden had become a branded economic good through its physical actuality and the projection of its hosted events by broadcast and print media. Yet location mattered to spectatorship because attending audiences continued to generate revenue.

Pennsylvania Railroad office correspondence from the 1920s demonstrated the company's longstanding interest in developing the value of the rights above Pennsylvania Station in New York, but the economic pressure felt by the railroads after the World War II intensified the company's need for cash[146] In 1952 the president of the Hotel Governor Clinton proposed to take over the station above street level in order to erect a large amphitheater, office buildings, retail stores, hotels, and parking garage.[147] This proposal, though not attractive to the railroad, demonstrated the market's understanding that the transportation facility could be defined as a below-street use. By 1960 the railroad had undertaken an engineering survey of the station footings and columns in order to prepare for air rights development and had worked out possible schemes emphasizing office buildings.[148]

By late November 1960 the Pennsylvania Railroad was negotiating with the Graham-Paige Corporation, owners of Madison Square Garden, for the removal of the existing street-level portion of Pennsylvania Station and the rebuilding of the underground station and associated facilities. On and above a concrete slab Graham-Paige planned to develop an integrated sports, entertainment, and business complex.[149] Graham-Paige, incorporated as an automobile manufacturer in 1909, was by the late 1950s an investment company. In 1959 Graham-Paige took advantage of the Garden's weakness in relying on boxing events, acquiring the stock owned by Garden president

James D. Norris, whose International Boxing Club had been ruled a monopoly. Irving Mitchell Felt, president of Graham-Paige, took advantage of the failing railroad and, with the support of the hotel, realty, and business community, drove the Garden's relocation[150] Felt recognized the economic limitations of the old Garden at 49th Street and Eighth Avenue, net income in 1959 having declined to a little more than $400,000.[151] The claim of Madison Square Garden's public exhibition, that success in the 1950s prompted relocation in the 1960s, is incorrect.

Pennsylvania Railroad management recommended to the railroad board in June 1961 the acceptance of the air rights proposal advanced by Graham-Paige. The Graham-Paige entity would become Madison Square Garden Center, a new corporation in which the Pennsylvania Railroad would receive twenty-five percent ownership. The railroad planned to demolish the existing structure to a plane just above street level. The corporation was prepared to lease the air rights and construct a new arena and associated facilities above street level. Upon the opening of the new arena Graham-Paige agreed to demolish or remodel the old Garden so that it could not be used to compete[152]

Interviewed in July, 1961, Charles Luckman, Felt's architect, emphasized the office facilities and placed them at the head of the project on the Seventh Avenue frontage[153] The visual conception for the arena, as published in the New York press at the time of the initial public announcement, was of an intentionally "futuristic" kind superficially resembling Nowicki's earlier work for the North Carolina State Fair at Raleigh (fig. 6.3). In any event, Charles Luckman and his engineers moved away from any arresting parabolic forms in favor of the radial geometry Luckman had recently

employed in California for Marineland of the Pacific (Pereira & Luckman, 1959). The commercial reach increased as the design developed; the entrance court depicted in an early site plan (fig. 6.64) later became an enclosed mall (fig. 6.63).

Madison Square Garden Center, an affirmatively commercial site with a circular drummed arena for 20,000, office tower, exhibition and meeting space, 5,000-seat amphitheater, cinema, museum, and bowling center occupied the site of Pennsylvania Station. The rectilinear forms of the office tower (to the east) and United States Post Office (across 8th Avenue to the west) framed the arena. The area above ground, designated Pennsylvania Plaza, was divided into two zones of use new to the location: entertainment and office real estate. The new Pennsylvania Station, a third zone positioned below the street level slab divider installed by the Pennsylvania Railroad, continued to service commuter and long distance rail traffic. Escalators led down to the station. Upper and lower promenades, indicated by a marquee over Seventh Avenue, brought the attending public from transportation to the arena box office lobby.

The arena cylinder was free of internal support. It was roofed by a system of cables, anchored under the exterior sidewalk, connecting a peripheral compression ring with a central tension ring. The architect claimed that this was the largest building to use such a support system[154] Lev Zetlin, with Gehron & Seltzer, had deployed cables between compression and tension rings for the Utica Memorial Auditorium of 1959. The cables were pre-stressed by jacking apart two central tension rings. At the Garden, precast concrete panels clad the steel. A series of earth-tone-pebbled panels was offset

from the drum's concrete surface, just as the peripheral ring was separated from the drum's rim.

Overall, management asserted private control of the new Garden environment and diminished the public realm--or rather sought to redefine it. The progression to the arena, through 20,000 square feet of colonnade and glass-enclosed mall, enforced attendees' exposure to permanent retail stores and event-related concessions. This was in contrast to the previous Garden's comparable approach, the Eighth Avenue entrance arcade, which harbored petty sports gambling by fans and created no revenue for management. The new Garden was effectively a stack of group and individual discretionary spending opportunities with the arena at the top. The plaza level contained the mall, box office, amphitheater, cinema and retail locations. An intermediate level offered the bowling facility (probably held over from the old Garden), an art museum and "Madison Square Garden Hall of Fame." The upper level held the arena floor, staging and exhibition areas. The arena itself, visited by people already committed to spending for admission, did not need exposure to generalized floor traffic but held within it a separate world of impulse purchasing[155]

Madison Square Garden Center was conceived as a versatile commercial property, accommodating business real estate uses measured in leases and entertainment functions gauged in mass attendance at events and individual purchases at concessions. Management's architecture directed an undifferentiated public rather than subdividing the audience into targetable preference groups. Arena spaces and installations addressed the potential of the audience mass.

Arnold van Gennep, in *Rites of Passage*, discussed the encounter with threshold as a transformative activity: "To cross the threshold is to unite oneself with a new world.[156] The arena attendee negotiated a series of portals on the way to the interior, passing from street to lobby, lobby to concourse, and concourse to seating bowl. Yet the attendee's temporary new world was itself contested as arena management attempted to extract even more value by means of additional transactions. The spectator found that the cost of entering the seating bowl not only allowed him to experience the diachronic competition and entertainment projected from the arena floor, but forced him to be exposed to the synchronic barrage of visible and audible commercial messages from signage and electronic systems[157] The ambiguity of the attendee's condition, within the transitory new world as an event spectator yet outside it as a potential consumer, strengthened management's hand in both limiting the group's abandonment of normal rules of behavior and encouraging individual purchasing impulses. The objectives of disarming groups and stimulating individuals were projects of building design and management.

Beginning with Stanford White's building, each Madison Square Garden included configuration designed to facilitate extraction of additional value from attendees. White built an arcade over the sidewalk in order to extend the building's reach and increase advertising space. In Lamb's building, patrons entered under a marquee framed by retail businesses along Eighth Avenue. The passageway functioned as entrance to the amphitheater. But Luckman, in the new location, wanted to capture significant discretionary dollars for his client by creating spending opportunities on multiple levels.

Luckman placed the amphitheater on the block's western edge, requiring attendees to move through an elevated passageway situated above a comparable retailing passage on the lower level leading to Pennsylvania Station. The lower passage included a circular exhibit area, echoing the amphitheater's drum above. Luckman's progression, interrupted by the lobby of the office tower fronting Seventh Avenue, moved attendees past restaurants and retail businesses before depositing them at the box office and amphitheater. He coordinated his entrance spaces with commuter railroad and rapid transit passenger flow. This longstanding railroad practice had been followed also by the Grand Central Terminal architects, who completed the main concourse's western stair decades before its eastern counterpart was built. Luckman placed the main entrance system on the busy side, where McKim had located his own arcaded entrance. Luckman's funneled ingress moved everyone into an underground chute, programmed to provide pathways to national and suburban service as well as retail spending opportunities. Individual progression through any one of many doors into expanses of interior space was superseded by the directed movement of a stream.

After World War II the roofed arena became a participating asset in urban public policy. The arena, with its automotive accommodations and connections, cleared underperforming land and produced income. The industrial legacy of the pitched roof weakened; circles and ovoids proliferated. Project sponsors considered the curvilinear structure attractive to the family audience: the drum or dome connoted entertainment and display. The drum's surface took applied decoration in the form of visually assertive, repeating forms. Such volumes and textures, considered to be progressive in the public

mind, could convert the costs of site, construction, and operation by means of the commercial transactions they accommodated. Cantilever, tension ring, and even the boxy space frame facilitated the departure from the shed.

Management's performance expectations brought new attention to interior arrangements around and above the arena floor. The floor remained the object of view and locus of action but its relative stasis was apparent. By the time customers had entered the arena, they already had paid to view the floor. What else could they do and pay for? In answer, management populated the perimeter, approaches and surroundings with new places to spend time and money.

NOTES FOR CHAPTER 6

[1] *Municipal Auditoriums and the City Plan* (Chicago, IL: American Society of Planning Officials, 1949), 2, 4.

[2] For discussion of the perception of city form, see Kevin Lynch, *The Image of the City* (Cambridge, MA: Massachusetts Institute of Technology Press, 1960).

[3] E. g., Albuquerque, Dallas, Detroit, Fort Worth, Jacksonville, Long Beach, Nashville, Oakland, Pittsburgh, San Antonio, St. Paul. The pitched-roof form, used in Des Moines and Rochester for war memorials, and in Ottawa, was much less favored in postwar civic initiatives. See Appendix.

[4] See Farrell G. Symons, *Municipal Auditoriums* (Chicago, IL: Public Administration Service, 1950), 1.

[5] *Arena, Auditorium Stadium Guide*, first published in 1954. The editors, p. 9, noted "the up to date arena is not a haunt for the men folks on their night out."

[6] Naismith Memorial Basketball Hall of Fame, "A New League Arrives: The 1946-47 Basketball Association of America," www.hoophall.com/history/first_league.htm, accessed July 17, 2006.

[7] See Ohio State University, Department of Physical Facilities, "Facility Audit Report, St. John Arena Bldg 076," June, 1996.

[8] In the 1960s, advertisements for Ruberoid roofing membrane veered from extolling the product's capacity to eliminate the arena roof as an object of attention because the roof has been made leakproof, to featuring the product as complementary to the strong contours of unconventional roof design. See, e.g., *Construction Specifier* 14, no. 12 (May, 1962), and 15, no. 6 (Nov. 1962).

[9] See Daniel L. Schodek, *Structures*, 3rd. ed. (Upper Saddle River, NJ: Prentice Hall, 1998), 141.

[10] Nineteenth-and twentieth-century projects, including the use of a movable awning by Josep Sert for the auditorium of the Spanish Pavilion at the Paris World's Fair of 1937, are discussed in Philip Drew, *Tensile Architecture* (Boulder, CO: Westview, 1979), 142-50.

[11] "Matthew at the Fair," *Student Publications of the School of Design, North Carolina State College* 1, no. 1 (Winter 1951): 23-24.

[12] Tony Robbin, *Engineering a New Architecture* (New Haven, CT: Yale University Press, 1996), 12.

[13] See *The Civic Auditorium for San Diego: A Report* (San Diego, CA: City Planning Commission, 1953), 17.

[14] Christopher Tunnard and Boris Pushkarev, *Man-Made America: Chaos or Control?* (New Haven, CT: Yale University Press, 1963), 177, 179, 206.

[15] *A Planning Study of the North Station Area* (Cambridge, MA: Advance Planning Associates, 1960), 19; *Near West Development Area* (Chicago, IL: Chicago Department of Development and Planning, 1967), 3.

[16] Eric Hill and John Gallagher, *AIA Detroit: The American Institute of Architects Guide to Detroit Architecture* (Detroit, MI: Wayne State University Press, 2003), 12-18; "1949 Architects Show," *Weekly Bulletin of the Michigan Society of Architects* 23, no. 8 (Feb. 22, 1949): 93.

[17] *The Civic Center Plan: A Master Plan for Detroit* (Detroit, MI: City Plan Commission, 1946), 5; *Detroit Tomorrow Committee: A Report and Review Compiled for the Information of Committee Members and Interested Citizens* (Detroit, MI: Detroit Conference on Civic Development, 1958), 15.

[18] *Detroit Tomorrow Committee*, 9, 11, 26.

[19] Eliel Saarinen, *The City: Its Growth, Its Decay, Its Future* (New York: Reinhold, 1943), 134.

[20] Ibid., 144, 151, 175.

[21] Ibid., 127, 253-54.

[22] See *Master Plan Technical Report, Second Series, June 1954: Redevelopment Study: Selection of Areas and Assignment of Priorities* (Detroit, MI: City Plan Commission, 1954), 10D; fig. 3.

[23] Harold Schachern, "Lounge Area Planned for Civic Center," *Detroit News,* Oct. 17, 1955, 1-2.

[24] "Visitors' Bureau Taken With Garden," *Cincinnati Post*, Jan. 15, 1954, 14.

[25] David Powrie, interview with author, Feb. 24, 2001.

[26] See "Cobo Hall, Detroit, Mich.," *Michigan Society of Architects Monthly Bulletin* 34 (Oct. 1960): 17-22.

[27] "Convention-Exhibition Building; Preliminary Planning Documents, Giffels & Vallet, Inc., L. Rossetti; Associated Engineers and Architects, Dec. 1, 1954: Job No. 54-125," Detroit Municipal Reference Library, 2.

[28] Patrick Skaggs, Assistant Director of Operations, Cobo Arena, June 28, 2002.

[29] *Financing the Civic Auditorium* (Pittsburgh, PA: Pennsylvania Economy League, 1956), 4; Scrapbook "Pittsburgh Redevelopment," Carnegie Library of Pittsburgh, Pittsburgh, PA.

[30] *Insurance Maps of Pittsburgh, Pennsylvania*, vol. 13 (New York: Sanborn Map Company, 1925); Randy Roberts, *Pittsburgh Sports: Stories from the Steel City* (Pittsburgh, PA: University of Pittsburgh Press, 2000), 40-41.

[31] *Tom Scallen Presents Ice Capades: Golden 50th Anniversary Edition* (Hollywood, CA: International Broadcasting Corporation, 1989), n.p.; scrapbook "Pittsburgh Redevelopment," Carnegie Library of Pittsburgh, Pittsburgh, PA.

[32] Martin Anderson, *The Federal Bulldozer: A Critical Analysis of Urban Renewal, 1949-1962* (Cambridge, MA: Massachusetts Institute of Technology Press, 1964), 22; *Consolidated Report for 1951 – 1952* (Pittsburgh, PA: City Planning Commission, 1952), 1, 25.

[33] *Pittsburgh and Allegheny County, Planning to Reality: An Era of Progress and Accomplishment* (Pittsburgh, PA: Allegheny Conference on Community Development, 1956), 1. See also Robert C. Alberts, *The Shaping of the Point: Pittsburgh's Renaissance Park* (Pittsburgh, PA: University of Pittsburgh Press, 1980), 65-67; John J. Grove, "Pittsburgh's Renaissance: Industry's Role in the Rebirth of a City," *U. S. A. Tomorrow* 1, no. 1 (Oct. 1954): 15; 16; Roy Lubove, *Twentieth Century Pittsburgh: Government, Business, and Environmental Change* (New York: John Wiley & Sons, 1969), 106-08;

Franklin Toker, *Pittsburgh: An Urban Portrait* (Pittsburgh, PA: University of Pittsburgh Press, 1994), 21; and Michael P. Weber, *Don't Call Me Boss: David Lawrence, Pittsburgh's Renaissance Mayor* (Pittsburgh, PA: University of Pittsburgh Press, 1988), 205, 233.

[34] Grove, 14; *A Plan for Pittsburgh's Golden Triangle* (Pittsburgh, PA: Regional Planning Association, 1962), 23, 39; Weber, 199.

[35] *Consolidated Report for the Years 1947, 1948, 1949, 1950* (Pittsburgh, PA: City Planning Commission, 1950), 16.

[36] Alberts, 46, 55; Richard Cleary, "Edgar J. Kaufmann, Frank Lloyd Wright, and the 'Pittsburgh Point Park Coney Island in Automobile Scale,'" *Journal of the Society of Architectural Historians* 52 (June 1993): 141, 143; Lubove, *Twentieth Century Pittsburgh*, 193; Robert Moses, *The Influence of Public Improvements on Property Values* (New York: Triborough Bridge and Tunnel Authority, 1953); Toker, 21.

[37] He contributed almost $163,000 for design work on municipal projects between 1947 and 1956. Box 1, folder 3, MSS #154, Records of the Edgar J. Kaufmann Charitable Foundation, Historical Society of Western Pennsylvania, Pittsburgh, PA.

[38] Pittsburgh Civic Light Opera, "History," www.pittsburghclo.org/history.html, accessed April 21, 2001.

[39] Rich Gigler, "The Civic Arena . . . Wonder or Blunder," *Pittsburgh Press*, Aug. 5, 1979, 4; Marvin E. Holderness, *Curtain Time in Forest Park: A Narrative of the St. Louis Municipal Opera 1919-1958* (St. Louis, MO: St. Louis Municipal Theatre Association, 1958), 104-05; Dahlen Ritchey, interview with author, Feb. 3, 2001; "Wolk Recalls Arena 'Inspiration,'" *Pittsburgh Press*, Oct. 12, 1960, scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA.

[40] Gigler, 4; "Court Upholds City in Light Opera Site Case," *Pittsburgh Press*, Jan. 3, 195, scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA.

[41] Dahlen Ritchey, interview with author, Feb. 3, 2001.

[42] Board minutes, 47th meeting, Mar. 10, 1947, Allegheny Conference on Community Development; Cleary, "Edgar J. Kaufmann," 145.

[43] Alberts, 92.

[44] Wright's concept was realized by others in later complexes, e.g., the Hartford Civic Center (Lewis Eisenstadt; Vincent Kling & Associates; Harry Danos & Associates, 1958, 1971-75) contained an arena within a retail mall and integrated parking.

[45] Christopher Wilk, *Frank Lloyd Wright: The Kaufmann Office* (London: Victoria & Albert Museum, 1993), 27, 30.

[46] Ritchey worked in the design department of Kaufmann's department store. The firm of Mitchell and Ritchey (1938-1957) was responsible for the design of Mellon Square (1955) and other Pittsburgh projects.

[47] David De Long, ed., *Frank Lloyd Wright and the Living City* (Weil am Rhein, Germany: Skira, 1998), 64, 163; Dahlen Ritchey, interview with author, Feb. 3, 2001.

[48] Gilbert Love, "Giant Center for Sports, Conventions Proposed for Pittsburgh of Tomorrow," *Pittsburgh Press*, Oct. 30, 1947, 22; "Pittsburgh in Progress: Toward a Master Plan," *Pencil Points* 28, no. 6 (June 1947): 67-72.

[49] Cleary, "Edgar J. Kaufmann," 149, 154-55.

[50] Wright's proposals were exhibited at the Carnegie Institute of Technology in 1949. See Alberts, 96.

[51] "Amphitheater Umbrella Unfolds in 2 ½ Minutes," *Architectural Forum* 91, no. 5 (Nov. 1949): 72; board minutes, 68th meeting, Feb. 14, 1949, Allegheny Conference on Community Development.

[52] Weber, 266.

[53] Board minutes, 74th meeting, Aug. 1, 1949, Allegheny Conference on Community Development; Cleary, "Edgar J. Kaufmann," 155; "Pittsburgh Renascent," *Architectural Forum* 91, no. 5 (Nov. 1949): 59; Dahlen Ritchey, interview with author, Feb. 3, 2001.

[54] *Consolidated Report for the Years 1947, 1948, 1949, 1950,* 24.

[55] "Multi-Million Dollar Face-Lifting for Hill District," *Pittsburgh Press*, March 26, 1951, scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA.

[56] *Consolidated Report for 1951 – 1952*, 4, 13; Weber, 200, 274.

[57] Board minutes, 113th meeting, Jan. 19, 1953, Allegheny Conference on Community Development; "Opera, Arena Plans are Progressing; *Pittsburgh Post Gazette* Jan. 29, 1953, scrapbook, Carnegie Library of Pittsburgh; "Opera, Sport Auditorium is Step Nearer," *Pittsburgh Post Gazette*, Feb. 7, 1953, scrapbook, Carnegie Library of Pittsburgh; Weber, 271.

[58] Dahlen Ritchey, interview with author, Feb. 3, 2001.

[59] *Plan for Golden Triangle*, 58.

[60] *Consolidated Report for 1951 – 1952,* 10, 33 (note); *Pittsburgh and Allegheny County, Planning to Reality*, 12; *A Policy on Arterial Highways in Urban Areas* (Washington, DC: American Association of State Highway Officials, 1957), 7; Urban Advisors to the Federal Highway Administrator, *Freeway in the City* (Washington, DC: U. S. Government Printing Office, 1968), 30.

[61] The New Haven Veterans Memorial Coliseum, with its associated Knights of Columbus tower (Kevin Roche, John Dinkeloo, and Associates; 1965-72) performed a comparable function as marker of the central business district limit.

[62] Grove, 21.

[63] Patrick Horsbrugh, *Pittsburgh Perceived: A Critical Review of Form, Features and Feasibilities of the Prodigious City* (Lincoln, NE: Woodruff Printing, 1963), 245.

[64] The 1947 Kaufmann store exhibit forecasted an "invasion of Pittsburgh by greenery: Nature will be as much a part of the city as it is of the country." See "Pittsburgh in Progress: Toward a Master Plan," *Pencil Points* 28, no. 6 (June 1947): 67-72. See also "Landscaping Adds to Arena's Beauty," n.d., scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA.

[65] James A. Mitchell and Dahlen K. Ritchey, "Impressions and Reflections, Part I," *Charette* 17, no. 7 (July 1937): 2; Mitchell and Ritchey, "Impressions and Reflections, Part II, *Charette* 17, no. 8 (Aug. 1937): 1-2; Dahlen Ritchey, "Thesis Program: A Memorial Building to Stephen C. Foster," A. M. thesis, School of Architecture, Harvard University, 1933.

[66] For the profession's marketing of steel, see "Architectural Beauty in Steel, Traveling Exhibition," *Architectural Record* 122 (Sept. 1957): 28.

[67] *Official Guide Book: New York World's Fair 1939* (New York: Exposition Publications, 1939), 195; Walter Dorwin Teague, *Design This Day: The Technique of Order in the Machine Age* (New York: Harcourt, Brace, 1940), 1, 76, 170.

[68] Helen A. Harrison and Joseph P. Cusker, *Dawn of a New Day: The New York World's Fair, 1939/40* (New York: New York University Press, 1980), 12.

[69] See Jeffrey L. Meikle, *Twentieth-Century Limited: Industrial Design in America, 1925-1939* (Philadelphia, PA: Temple University Press, 1979), 29-30.

[70] "Architect's Statement; General Motors Technical Center," series VII, box 13, folder 98, Eero Saarinen Papers, Manuscripts and Archives, Yale University Library, New Haven, CT.

[71] "Pittsburgh's Magic Dome with its mammoth movable roof is a real step in Pittsburgh's plan for a new look. Local 3 members are happy and proud to have a hand in rebuilding their favorite city." From James "Bill" Lee, "Civic Arena: Local 3 Has Hand in 'New Look' for Pittsburgh," *Ironworker* (Sept.1960), http://www.info-ren.org/oral-histories/manchester/bidwell/lee/lee7b.html, accessed April 21, 2001.

[72] Roy Lubove, "City Beautiful, City Banal: Design Advocacy and Historic Preservation in Pittsburgh," *Pittsburgh History* 75, no. 1 (Spring 1992), 32. The city wanted to create an overall design image. See Meikle, 29-30; *1962 – 1963 Community Renewal Program: A City Rebuilds* (Pittsburgh, PA: Department of City Planning, 1962), CR 121-33.

[73] "13-Year Dream Realized in Arena," *Pittsburgh Press*, Sept. 17, 1961 scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA.

[74] "Color Order of Day in New Auditorium," *Pittsburgh Press*, n.d., scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA

[75] Dahlen Ritchey, interview with author, Feb. 3, 2001.

[76] Ibid.

[77] The author of the only published handbook of arena operation predicted such problems. See Herman J. Penn, *Encyclopedic Guide to Planning and Establishing an Auditorium, Arena Coliseum or Multi-Purpose Building* (Greenville, SC: Penn-Fleming Publications, 1963), 110-11.

[78] Board minutes, 160th meeting, Apr. 15, 1957, Allegheny Conference on Community Development.

[79] See *Pittsburgh and Allegheny County, Planning to Reality*; *Pittsburgh Sun Telegraph*, Oct. 30, 1947, scrapbook, Carnegie Library of Pittsburgh, Pittsburgh, PA.

[80] Dahlen Ritchey, interview with author, Feb. 3, 2001.

[81] Box 4, folder 4, MSS #154, Records of the Edgar J. Kaufmann Charitable Foundation, Historical Society of Western Pennsylvania, Pittsburgh, PA; see also Toker, 79-83.

[82] *Plan for Golden Triangle*, 83, 102, 115, 118.

[83] By 1961, 1551 families, 458 individual householders and 416 business concerns had

been relocated from the project site. See *Community Renewal Program Relocation Report: Social Aspects,* (Pittsburgh, PA: Department of City Planning, 1963), 24. See also Lubove, *Twentieth Century Pittsburgh*, 130,132; and William Zeckendorf with Edward A. McCreary*, The Autobiography of William Zeckendorf* (New York: Holt, Rinehart and Winston, 1970), 228-29.

[84] John R. Dorsey and James D. Dilts, *A Guide to Baltimore Architecture*, 3rd ed. (Centerville, MD: Tidewater Publishers, 1997), 45, 63; Greater Baltimore Committee, Report (Baltimore, MD: GBC, 1964), n.p..

[85] *Baltimore Civic Center for Dedication Week Souvenir Book* (Baltimore, MD: Baltimore Civic Center, 1963), 12.

[86] Sean Topham, *Where's My Space Age? The Rise and Fall of Futuristic Design* (Munich: Prestel, 2003), 57.

[87] Jay Greenberg, *Full Spectrum: The Complete History of the Philadelphia Flyer Hockey Club* (Chicago, IL: Triumph Books, 1996), 5-6.

[88] Frank Remesch, Assistant General Manager, Baltimore Arena, to author, July 10, 2002.

[89] For the subsequent substantial developments, see William Jordy, *Buildings of Rhode Island* (New York: Oxford University Press, 2004), 39.

[90] I. M. Pei & Associates, *Weybosset Hill, Providence, Rhode Island*, (Providence, RI: Providence Redevelopment Agency, 1963).

[91] See Francis J. Leazes and Mark T. Motte, *Providence, the Renaissance City* (Boston, MA: Northeastern University Press, 2004), 60, 61, 164.

[92] "Providence Civic Center," www.provcc.com/new_site/history.htm, accessed July 23, 2003.

[93] See Greater Hartford Chamber of Commerce, *Renewal Program for Downtown, Hartford Connecticut* (Hartford, CT: Greater Hartford Chamber of Commerce, 1960), 1-7; *Hartford, Connecticut, Interim Plan for Downtown*. Hartford, CT: Rogers, Taliaferro and Lamb,1959, 1, 2, 43, 44, 52; Anne Crofoot Kuckro, *Hartford Architecture: Volume One: Downtown* (Hartford, CT: Hartford Architecture Conservancy, 1978), 91.

[94] Greater Hartford Chamber of Commerce, *Renewal Program for Downtown,* II-19.

[95] Aetna, "Aetna At A Glance," www.aetna.com/history/1963all.htm, accessed Nov. 10, 2003. See also Robert H. Salisbury, *Governmental Reorganization: Prospects for Action* (Hartford, CT: Greater Hartford Chamber of Commerce, 1964).

[96] Greater Hartford Chamber of Commerce, *Renewal Program for Downtown,* III-17.

[97] American City Corporation, *Greater Hartford Process* (Hartford, CT: Greater Hartford Process, 1972), 63-64.

[98] Dorsey and Dilts, 376-77.

[99] *Hartford Civic Center Opening January 9, 10, 11, 12: Official Program* (Springfield, MA: Nolan Publications, 1975), 8; Kuckro, 96-97.

[100] The saucer attracted the attention of designers working in a range of public assembly contexts, from O. Roy Chalk's monorail proposal for Washington, DC, to Shurcliff and Shurcliff's zoo building for Franklin Park, Boston.

[101] Stewart O'Nan, *The Circus Fire* (New York: Doubleday, 2000), 276, 333.

[102] See Tom Parkinson, "Ringling's Rebuilding Feat Rivals Best Circus Stunts," in *Arena, Auditorium Stadium Guide 1961* (New York: National Sports Publication, 1961), 104-05; Patricia Schwab, "Irvin Feld: The Greatest Showman on Earth," in *Ringling Bros. And Barnum & Bailey Circus 109th Edition*, n.p..

[103] Benjamin G. Rader, *American Sports: From the Age of Folk Games to the Age of Televised Sports*, 3rd ed. (Upper Saddle River, NJ: Prentice-Hall, 1996), 234, 256.

[104] Quoted in Penn, 6.

[105] Lisa Panetta-Alt, Manager, Crisler Arena, to author, Sept. 10, 2002.

[106] Penn, 30-33, 48.

[107] *Arena, Auditorium Stadium Guide 1967* (New York: National Sports Publication, 1967), 44.

[108] "Papers Filed on Sports Arena," *Cincinnati Enquirer*, May 3, 1938, 8.

[109] "Huge Sports Arena Assured for Cincinnati," *Cincinnati Enquirer*, Nov. 30, 1946, 11; "Local Group Would Build Sports Arena," *Cincinnati Post,* Feb. 23, 1938*,* 22;

[110] "Reeder Insists Arena Should Be by River," *Cincinnati Post*, Jan. 24, 1947, 1.

[111] "'Bottoms' Arena Site Offered as Gift to City," *Cincinnati Times-Star*, Mar. 28, 1947, 1; "Carthage Fairgrounds Sought for Arena Site," *Cincinnati Times-Star*, June 19, 1947, 1; "Plan Board Approves Arena Location," *Cincinnati Enquirer*, May 20, 1947, 2A.

[112] See Richard Longstreth, "Sears, Roebuck and the Remaking of the Department Store, 1924-42," *Journal of the Society of Architectural Historians* 65, no. 2 (June 2006): 238-79. David L. Ames has provided criteria for the interpretation of suburbanization in "Interpreting Post-World War II Suburban Landscapes as Historic Resources," in Deborah Slaton and Rebecca A. Schiffer, *Preserving the Recent Past* (Washington, DC: Historic Preservation Education Foundation, 1995) and "A Context and Guidelines for Evaluating America's Historic Suburbs for the National Register of Historic Places," circulated for review and comment in 1998. See NPS.gov, "History & Culture," http://www.cr.nps.gov/nr/publications/bulletins/suburbs/text1.htm, accessed Feb. 7, 2007.

[113] Geoffrey J. Giglierano, Deborah Ann Overmyer and Frederic L. Propas, *The Bicentennial Guide to Greater Cincinnati: A Portrait of Two Hundred Years* (Cincinnati, OH: Cincinnati Historical Society, 1988), 565; "Site Near Bond Hill Rezoned to Allow for Construction of 11,000 Seat Sport Arena," *Cincinnati Enquirer*, Nov. 13, 1947, 1; "Site of 20 Acres Bought for Arena," *Cincinnati Times-Star*, July 15, 1947, 4; "Zone Changes Approved For Site of New Arena," *Cincinnati Enquirer*, Sept. 30, 1947, 2A.

[114] *Cincinnati Times-Star*, Feb. 22, 1949, 6.

[115] *The Plan for Downtown Cincinnati* (Cincinnati, OH: City Plan Commission, 1964).

[116] See *Pattison Avenue East Redevelopment Area Plan* (Philadelphia, PA: City Planning Commission, 1955.

[117] The stadium and neighborhood issues are discussed in Bruce Kuklick, *To Every Thing a Season: Shibe Park and Urban Philadelphia 1909-1976* (Princeton, NJ: Princeton University Press, 1991), 131-37.

[118] Greenberg, 2, 4.

[119] See Rader, 270.

[120] See Vincent Scully, Catherine Lynn, Erik Vogt, and Paul Goldberger, *Yale in New Haven: Architecture and Urbanism* (New Haven, CT: Yale University, 2004), 306.

[121] Drew, 158.

[122] Eero Saarinen, *Eero Saarinen on His Work*, rev. ed. (New Haven, CT: Yale University Press, 1968), 5.

[123] Ibid., 5, 6, 40.

[124] Ibid., 60.

[125] DeLaney Kiphuth to Alfred Whitney Griswold, Aug. 8, 1956, folder 332, President's Office box 36, Manuscripts and Archives, Yale University Library, New Haven, CT.

[126] See statement by Griswold in Don Metz, *New Architecture in New Haven* (Cambridge, MA: MIT Press, 1966), n.p..

[127] Saarinen to Griswold, Sept. 7, 1956; Saarinen to Griswold, Sept. 24, 1956; folder 332, President's Office box 36, Manuscripts and Archives, Yale University Library, New Haven, CT.

[128] Saarinen to Griswold, Sept. 24, 1956, folder 332, President's Office box 36, Manuscripts and Archives, Yale University Library, New Haven, CT.

[129] See "Architect and Engineer Speak," *New Haven Journal-Courier*, Oct. 14, 1958, 2.

[130] Griswold to David S. Ingalls, Dec. 28, 1956, folder 332, President's Office box 36, Manuscripts and Archives, Yale University Library, New Haven, CT.

[131] In an interview with the author on Feb. 24, 2001, David Powrie, a designer in Saarinen's office on this job, cited the influence of Nowicki's structure.

[132] Two similar Saarinen sketches are identified as alternative "tent" versions in Peter C. Papademetriou, "David S. Ingalls Hockey Rink, Yale University, New Haven, 1956-59, di Eero Saarinen. Intenzioni in tensione," *Casabella* 63, nos. 673/674 (Dec. 1999 – Jan. 2000): 99.

[133] Fred Severud had also helped Nowicki with the Dorton Arena, Raleigh, NC, of 1952. See Jayne Merkel, *Eero Saarinen* (New York: Phaidon, 2005), 124.

[134] See Drew, 172; Frei Otto, *Tensile Structures* (Cambridge, MA: MIT Press, 1969), 2: 55.

[135] David Powrie, interview with author, Feb. 24, 2001.

[136] "Architect's Statement; Jan. 1959," series VII, box 13, folder 99, Eero Saarinen Papers, Manuscripts and Archives, Yale University Library, New Haven, CT.

[137] Bill Ahern, "Yale vs. Northeastern," *New Haven Register* Dec. 3, 1958.

[138] Yale art history faculty to Griswold, Dec. 12, 1956, folder 332, President's Office box 36, Manuscripts and Archives, Yale University Library, New Haven, CT. Signatories of the letter included Vincent Scully, who later changed his mind, citing the building's "structural pretension" and "disastrous urbanistic effect." See Scully, *American Architecture and Urbanism*, rev. ed. (New York: Henry Holt, 1988), 198; Scully, et al., *Yale in New Haven*, 307.

[139] See Maritz Vandenberg, *Cable Nets* (Chichester, West Sussex: Academy Editions, 1998), 15, 16, 29.

[140] Sketches for Dulles quoted the Ingalls Rink spine. "Dulles International Airport pencil sketch, terminal and roof, ca. 1960, MSRG 593, Digital Image Collection Image 3126; box 1, folder 1, Eero Saarinen Papers, Manuscripts and Archives, Yale University Library, New Haven, CT.

[141] See Kenzo Tange, "Zum Entwurf der Sporthallen in Tokio," *Bauen und Wohnen* 19 (Oct. 1965): 119-27.

[142] John Harwood and Janet Parks, *The Troubled Search: The Work of Max Abramovitz* (New York: Miriam and Ira D. Wallach Art Gallery, Columbia University, 2004), 123-25; Frederick Koeper, *Illinois Architecture from Territorial Times to the Present: A Selective Guide* (Chicago, IL: University of Chicago Press, 1968), 34.

[143] Penn, 168.

[144] Pier Luigi Nervi, Buildings, Projects, Structures, 1953 – 1963 (New York: Frederick A. Praeger, 1963), 6, 20-21, 32-39, 66-83; Edgar W. Ray, *The Grand Huckster: Houston's Judge Roy Hofhenz Genius of the Astrodome* (Memphis, TN: Memphis State University Press, 1980), 230.

[145] Ray, 231.

[146] Pennsylvania Railroad, Vice President of Finance, General Office Files 0136-2, "Pennsylvania Station Development of Air Rights," box 257, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE.

[147] Pennsylvania Railroad, Vice President of Finance, General Office Files 0136-2, "Pennsylvania Station Development of Air Rights," J. T. Ridgely to engineer, treasurer, attorney, July 11, 1952, folder 10, box 257, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE.

[148] Pennsylvania Railroad, Vice President of Finance, General Office Files 0136-2, "Pennsylvania Station Development of Air Rights," J. B. Jones to T. M. Goodfellow,

President and General Manager Long Island Railroad, Feb. 23, 1960, box 257, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE.

[149] Pennsylvania Railroad, Vice President of Finance, General Office Files 0136-2, F. N. S. to D. C. B., Apr. 19, 1961, box 257, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE.

[150] Zander Hollander, *Madison Square Garden: A Century of Sport and Spectacle on the World's Most Versatile Stage* (New York: Hawthorn Books, 1973), 45; Pennsylvania Railroad, Passenger Traffic Department Office Files, V. H. M. to F. C., Sept. 18, 1962, box 1128, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE; Gene Smith, "Personality: Breathing Life Into a 'Shell'," *New York Times*, June 18, 1961;

[151] Pennsylvania Railroad, Vice President of Finance, General Office Files 0136-2, "Pennsylvania Station Development of Air Rights," F. N. S. to J. B. J., Nov. 30, 1960; F. N. S. to J. B. J., Nov. 30, 1960, folder 12, box 257, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE.

[152] Pennsylvania Railroad, Vice President of Finance, General Office Files 0136-2, J. B. Jones to A. J. Greenough, President, June 26, 1961; Pennsylvania Railroad to Luckman Associates, Mar. 28, 1962, box 257, accession 1810; Passenger Traffic Department Office Files, J. B. Jones to I. M. Felt, President, Graham-Paige Corporation,, Oct. 31, 1961, folder 15, box 1128, accession 1810, Manuscripts and Archives Dept., Hagley Museum and Library, Wilmington, DE.

[153] "New Madison Square Garden to Rise atop Penn Station," *New York Times*, July 25, 1961.

[154] "New Garden in $75 Million Center to Seat 25,000," *New York Daily News*, July 27, 1961.

[155] See *Madison Square Garden Center: A New International Landmark at Pennsylvania Plaza, New York* (New York: Madison Square Garden Center, ca. 1966).

[156] Arnold van Gennep, *The Rites of Passage*, transl. Monika B. Vizedom and Gabrielle L. Caffee (Chicago, IL: University of Chicago Press, 1960), 20, 24.

[157] Concession stands changed from off-hand inclusion as service points in narrow concourses to privileged placement throughout the facility. The University of Maryland's Cole Field House of 1955 had a concourse of ten-foot width. Concourses in agricultural fair arenas tended to be somewhat wider.

Chapter 7

CONCLUSION

This account has demonstrated that institutions of the nineteenth-century industrialized world revived the ancient condition of observed competition established within a purpose-built structure. Arena floor, bowl, roof and mechanical and electrical systems in conjunction provided the environment necessary to the controlled presentation of events. Individuals secured the right to witness by paying an entrance fee. This "live" transaction was central to the arena's immediate utility but became a progressively lesser part of the arena's instrumentality, which extended beyond the physical reality of site and enclosure. The characteristics of the main volume within that enclosure did not change much. For a time, clients and architects felt compelled to mask the buildings' engineering and roof-mounted mechanical systems. The architects shaped the arena's internal form and space to align with transactional expectations. The head-house format of the early twentieth century provided direct entrance to the seating bowl, the aisles of which functioned as nominal pathways. The perimeter concourse started as a common express route to any one of multiple seating destinations around the bowl. Later, as best practices were developed and shared among facility managers, the concourse began to provide points of convenience service and commercial exchange. These business opportunities dismantled the community into individual potential customers. Goethe's "noble body" of spectators had been atomized by visual and aural transmissions offering apparent product

and service choice. Both facility management and attraction sponsorship used broadcast media, advertisements and printed matter to build value exchange external to the venue. Much of this potential depended on the formation of an arena of the mind. The event's actuality was displaced by its media-based representation. The customer was no longer just attending, but absorbed, as well, in other activities.

We have seen that mass and physical fabric did not disappear. In some cases, the powerful associations produced by external form invited the spectator to enter an alternate, if transitory, environment. Or, retrieved form, such as a temple front, utilized an ideal thought to be both common and timeless. Yet the site was potent, as well. Understanding the arena as autonomic or component is useful in assessing its context upon the ground. Was the building conceived as a free-standing entity or as part of a campus of interdependent structures of associated purpose? Of course, the attributes are not absolute indications. The arena entrepreneur of the 1920s often sited his single project near hotels and public transportation. It well could have been part of a commercial block. But it was still an independent venue. It is true that the arena in a 1930s civic group acquired its own audience independent of the population served by the other elements of the complex. But its placement and form were part of a planned whole.

Site, sponsorship, and purpose revealed an arena as apart-from or part-of. The data collected on arenas with capacity of 10,000 or more persons built between 1874 and 1968 (see Appendix) showed the autonomous facility yielding its initial primacy during the decade of the 1910s. After that time, componency exceeded autonomy in the number of buildings constructed. Both types spiked in the decade of the 1920s and

declined in the 1940s. The postwar building boom boosted building generally, with the number of component arenas greatly exceeding stand-alone venues by the end of the 1960s.

Most independent facilities were sited on streets until after World War II, when the entry of highways into cities began to generate arterials and new, often direct vehicular connections to venues of assembly. In the 1960s, a number of autonomous facilities occupied space within significant expanses of land. Usually, the site planner located the arena at the center of density, determined by the movement patterns of pedestrians and motorized transportation. But not all siting was done in this centroidal manner. The location of many buildings appears to have been entirely incidental and arbitrary. Within the component group, the number of facilities at colleges and universities began to rise in the 1920s, quickly overtaking the number of arenas in civic, agricultural, or fairgrounds complexes. The development of intramural opportunities for students, administrators' interest in building support for the institution in the community and the nation, and the presence of a captive student audience were factors in expanding construction on campus.

In the city, the arena project allowed for some exercise of individual will in siting and design. But that project was forwarded mainly by assertive public policy that, before World War II, mandated public construction and, afterwards, privileged partnerships with the private sector in order to render large-scale changes to urban land. Educational institutions, clients for the largest number of arena construction projects and

governed by space and budget restrictions, usually, but not always, aligned their arenas with the prevailing campus style.

Across the time period considered in this work, roof enclosure evolved from arched and pitched forms, and thin-shell experiments, toward the dome and drum. By the end of the period, circular and ovoid buildings were receding in favor of the operationally more efficient rectilinear footprint covered by a flat truss or space frame. The steel cage was in place by the end of the nineteenth century. The emergence of dome, drum, and tensile solutions allowed roof support to act as a design element as well as engineering. Internal treatments moved toward finished surfaces of stone, colored tile, metals, and designed artificial lighting. The exteriors of brick and stone became complex fields of concrete, glass, and multiple forms of metal. Scale tended to increase.

The European application of the ancient configuration was appropriated for contemporary purpose, initially with private sponsorship and later with increased involvement of public administration. This account has begun to explore the capacity of internal architecture to create transitory worlds of spectacle and to afford the community with movement and choices within. We have seen how the arenas, sustained by earned revenue, subsidy or institutional role, acted on their external settings through site, formal mass, and design. It is hoped that this account will direct attention to a building type whose broad distribution was created by the activities held within but whose interest extended beyond the accommodation of the unenduring event.

EPILOGUE

Roofed arenas did not stop being built in 1968. Far from it. The century's last quarter was marked by waves of arena construction and considerable public discussion. Buildings extant at the beginning of the quarter, whether small (e.g., Oceanside Athletic Club, Oceanside, CA) or large (Chicago Stadium) generally were gone by its end. Some, such as the Washington Coliseum (Uline Arena), survived to be considered for inclusion in urban projects with combined residential, office and retail functions. Repurposing extended the life of other structures; as, for example, when the University of Chicago converted Bartlett Hall gymnasium (Shepley, Rutan and Coolidge, 1901-03) to a dining facility in 2002 (Bruner/Cott, Cambridge, MA).

The small, commercial, urban arena, usually in its fourth decade of business by 1968, was an exhausted enterprise. The scale and economics of downtown change, fueled by the irresistible automobile and the availability of public financing, overwhelmed the private operator's worn physical plant and meager dimensions. Downtown sites accommodated large volumes and allowed designers to assert substantial footprints, such as those claimed by Kemper Arena, Kansas City (Helmut Jahn, 1972-74) or Joe Louis Arena, Detroit (Smith, Hinchman & Grylls, 1977-79). These arenas, with the engineering sometimes expressed on the exterior, typically offered no view to the interior. The same held for regional facilities located near highway interchanges, such as the Capitol Centre, Landover, MD (Shaver Partnership; Geiger-Berger and Associates, 1973) and Brendan Byrne Arena, Meadowlands, East Rutherford, NJ (Grad Partnership

and Dilullo, Clauss, Ostroki & Partners, 1977-81). The wider concourses in these venues allowed attendees better access to more concession stations.

Arenas could look quite different, one from another, but the standard size of the arena floor created an overall resemblance in volume if not in shape. They tended to be regular, symmetrical, and closed in form. Their relatively limited variance contrasted with the irregular and open forms of baseball parks, which developed originally on land parcels defined by multi-angled property lines and streets. Many of these older stadia had been replaced in the 1960s by monolithic drums set within acres of automobile parking, among them District of Columbia Stadium (George A. Dahl, 1960-65) and William A. Shea Municipal Stadium in Queens, New York (Praeger-Kavanaugh-Waterbury, 1961-64). By the 1980s team managements began to understand that marketable environments, capable of attracting customers even without the presence of live events or competitions, could be constructed from packaged quotations of visuals and spaces derived from the old parks. It might be little more than a shallow wrap of brick over paired concrete pylons or a bit of exposed steel. These venues usually offered ticketed access to club seating, an amenity that provided a transitory experience of luxury, and smaller capacity, yielding a higher spectator occupancy rate. The first of such entertainment destination venues, although not a roofed arena, was Oriole Park at Camden Yards, Baltimore (Hellmuth, Obata and Kassabaum; RTKL; Wallace, Roberts and Todd, 1988-92). The architects of Camden Yards and its legacy facilities used brick and steel to emblematize the spaces lodged in attendees' memories. These places, which included Citizens Bank Park, Philadelphia (Ewing Cole Cherry Brott, Philadelphia; HOK Sport, Kansas City, 2001-

04), were studiedly irregular in shape, even when their sites would have allowed fully symmetrical configuration.

Following baseball's example, a few arenas built in the 1990s absorbed markers of old forms. The Fargo Dome, Fargo, ND (Sink, Combs & Dethelfs, 1992-93) and the Conseco Field House, Indianapolis (Ellerbe Becket, Architects and Engineers, 1997-99) used the earlier arched or pitched roof profiles. The stepped brick façade of the Sovereign Bank Arena, Trenton, NJ (Mercer County Improvement Authority, 1998-99) was intended to reference the previous industrial use of the property. In one case, an older arena interior provided source material for another building type through an act of appropriation: The University of Pennsylvania's Palestra provided the spatial relationship used in the central court of the Midfield Terminal Complex at the Pittsburgh International Airport (Tasso Katselas Architects, Pittsburgh), which opened in 1992. The Palestra supplied the overall volume, exposed trusswork, and seating ranks. Shoppers walking to the airport's balcony stores were encouraged to look down onto the court, as fans would look down to the Palestra's floor. In each of these cases, the architects accompanied the retrieved architectural language with sophisticated lighting and signage designed to highlight spending opportunities. But most arena architects of the recent period did not participate in baseball's strategic mining of past architectures. Instead, they redefined the arena as a revenue-generating entertainment system by reshaping its interior spaces and fracturing the exterior wall, one of the elements of the arena's basic spatial envelope of wall, seating bowl, and roof. Transparent extrusions allowed views from the outside. The designs, among them Rob Robbie's retractable roofed Skydome, Toronto (1989); Ellerbe

Becket's Fleet Center, Boston (1993-95), and Savvis Center, St. Louis (1993-94), Vitetta Group and Thompson Ventulett Stainback & Associates' Liacouras Center, Temple University, Philadelphia (1997), and NBBJ Architects' Staples Center, Los Angeles (1999-2000), drained attention from the arena floor by creating entertaining points of sale along the outside rim of the distended and bulging concourses, now forty and fifty feet wide. Interior roof engineering, environmental control and rigging grid were fully exposed, even featured. Video monitors transmitted floor action to the periphery. The periphery became the center. In terms of revenue, the arena perimeter had become just as important as the seating bowl. Management was interested in fueling per capita spending and arranging staffing and placement to handle purchasing volume at peak times. The concourse became less of a transitional space and the live event became only marginally more important than its electronic representation. Controlled, level-specific club seating provided a select group access to a multiplicity of transaction zones outside the seating bowl. Some of these zones, dedicated to selling hats, sweatshirts, and replica team uniforms, or serving drinks at replicas of neighborhood taverns, encouraged attendees to project elements of their personal identities to a collective--while maintaining stance as spectator-observers. By the beginning of the twenty-first century, web representation of venues and teams brought new revenue streams based on individual credit and debit transactions encouraged by colorful, highly compartmentalized and interactive graphic presentations on the computer desktop. Yet the disembodied product did not supplant the physical fabric.

In the realm of new construction under consideration in 2006, it is clear that developers understood the continuing utility of arena volume in establishing scale in a project area and providing opportunity for maximizing the gain from rising property values. The arena, even with its public function and accessibility, did not help its related cluster of large commercial buildings to avoid community opposition. Collaborating with Frank Gehry, the developer Forest City Ratner planned an extensive, arena-anchored project at the triangle formed by the intersection of Atlantic and Flatbush Avenues in Brooklyn. Neighborhood associations, churches and businesses forced modifications in the proposal and a reduction in overall size. But supporters pointed to the project's creation of thousands of units of below-market housing. In Manhattan, at the same time, Vornado Realty and the Related Companies explored the possibility of removing Luckman's Madison Square Garden (1968) and constructing its Cablevision Systems Corporation-owned successor amid the proposed Daniel Patrick Moynihan Station, itself a planned intervention within a repurposed James A. Farley Post Office Building (McKim, Mead & White, 1910-13) and its western annex (1934-35), located in the block defined by West 31st and West 33rd Streets and Eighth and Ninth Avenues. This scenario generated newspaper advertisements characterizing the arena as a predator entity, based on the experience of forty years before, when Luckman's Garden replaced McKim, Mead & White's Pennsylvania Station (1906-10). The public was urged to defend the integrity of the Moynihan Station plan, promoted as partial atonement for the shared failure to prevent the destruction of Pennsylvania Station. A counter argument held that removal of

the arena to the Moynihan Station side would facilitate the improvement of the entire transportation facility.

The underused parking garage atop New Haven's Veterans Memorial Coliseum (Roche & Dinkeloo, 1965-72) controlled the design, pinched the seating bowl and increased operating costs. The local government, weary of maintaining a weak plant and operation, tore down the Coliseum and deposited its Cor-Ten steel fragments and eroded concrete chunks inside giant dumpsters. Hartford sold the convention and mall components of its Civic Center to Northland Investment Corporation. It was expected that Northland would develop apartments, retail, and office space. The arena, leased by the state from the city, operated at a significant loss but continued in service long after the 1978 collapse of its roof.

Other cities, from post-industrial Bridgeport, CT, and Pittsburgh to Duluth, GA, and London, ON, planned and built roofed arenas. Some new buildings included sustainable features such as natural lighting and collection of rainwater for use in sanitary plumbing. The debate over whether the presence of a new arena brought measurable economic gain over the long term persisted within academic circles and the popular press. Undeterred and still attracted by the intangible benefit, municipal governments and regional associations continued to commission their own optimistic studies, intrigued by the prospect of having their own arenas, reading and misreading their markets' capacities to support sustained operation.

APPENDIX

TABLE OF ARENAS BUILT IN NORTH AMERICA BETWEEN 1853 AND 1968 WITH MINIMUM 10,000 CAPACITY

This table presents an extensive, but not complete, census of the large roofed arenas built in North America between Henri Franconi's Hippodrome of 1853 and the Madison Square Garden of 1968. The table, organized by state and Canadian province, provides the name of the facility; a single date of opening or span dates of planning, construction, and opening; architect; type of siting; and configuration of the building envelope. Component siting, in contrast to independent siting, indicates placement of the arena within a system of buildings of associated purpose. Centroidal positioning indicates a building's occupation of a spot at the functional center of mass, optimum for attendees approaching by foot or mechanized transportation. The 10,000 threshold separates the small, usually single-level buildings from the much less numerous large arenas. This division, observed by the arena industry's trade organization (International Association of Assembly Managers, Inc.-- IAAM), recognizes the revenue-generating potential and influence of the large venue, as well as the complexity of its physical envelope. Facilities small and large shared the essential structural and spatial elements. However, the mass of the large arena, derived from the length, breadth, and elevation necessary to accommodate substantial permanent seating, tended to create opportunities for affecting the surrounding, usually urban, environment. The table

includes selected significant arenas of smaller capacity; these are indicated in *italics.* The table does not include arenas expanded to 10,000 or greater capacity after 1968.

ALABAMA					
Auburn	Beard-Eaves Coliseum Auburn U. (Auburn Memorial Coliseum	1968-1969	Sherlock, Smith & Adams, Montgomery	Component: campus	Oval drum
Mobile	Mobile Municipal Auditorium (Civic Center Arena)	1964	Palmer & Baker; succeeded by Slater & Slater	Independent: centroidal	Oval drum
Montgomery	Garrett Coliseum Agricultural Center (Alabama State Coliseum)	1949-1951	Sherlock, Smith & Adams, Montgomery	Component: agricultural	Circular drum
Tuscaloosa	Alabama Memorial Coliseum (Coleman Coliseum)	1968	Miller, Martin, Lewis; Edwin T.McGowan; Birmingham; Amman & Whitney: William Paul Knight	Component: campus	Arched roof
ARIZONA					
Phoenix	Arizona Veterans' Memorial Coliseum	1965	Lester Mahoney; T.Y. Lin	Independent: incidental	Paraboloid
ARKANSAS					
Little Rock	Barton Coliseum, Arkansas State Fairgrounds	1948-1952	Erhart, Eichenbaum & Rauch	Component: agricultural	Oval dome
CALIFORNIA					
Berkeley	*Harmon Gymnasium,University of California*	*1931-1933*	*George Kelham*	*Component: campus*	*Centralblock, wings*
Inglewood	Los Angeles Forum	1967	Charles Luckman	Independent: centroidal	Oval drum
Long Beach	Long Beach Arena	1963	Kenneth C. Wing, Los Angeles	Component: civic	Ovoid
Los Angeles	Los Angeles Memorial Sports Arena	1959	Welton Becket & Associates; Brandow & Johnson	Component: park	Ovoid drum
Los Angeles	*Pan Pacific Auditorium*	*1935*	*William Pereira,Walter Wurdeman & Welton Becket*	*Independent: street*	Pitched roof
Los Angeles	Pauley Pavilion, University of California	1965-1966	Welton Becket & Associates	Component: campus	Flat truss
Oakland	Oakland Alameda County Coliseum Arena	1966-1968	Myron Goldsmith, Skidmore, Owings & Merrill	Component: civic	Circular drum
San Diego	San Diego International Sports Arena	1966	Unknown, Trepte Construction, Contractor	Independent: centroidal	Oval drum
San Francisco	Cow Palace	1935-1946	W.D. Peugh	Component: agricultural	Arched roof
San Francisco	*Kezar Pavilion*	*1923-1925*	*Willis Polk Co. ?*	*Component: park*	*Pitched roof*

San Francisco	San Francisco Exposition Auditorium	1913-1914	San Francisco Board of Comsulting Architects (John Reid, Jr., John Galen Howard, Frederick H. Meyer) remodelled 1964 Wurster, Bernardi & Emmons; Skidmore, Owings & Merrill	Component: civic	Pitched roof
COLORADO					
Denver	Coliseum	1947	Roberts & Schaefer and Lorimer & Ross, Chicago; Roland Linder	Independent: incidental	Arched roof
CONNECTICUT					
Hartford	Hartford Civic Center	1958 1971-1975	Lewis Eisenstadt; Vincent Kling & Associates; Harry Danos & Associates, Hartford	Component: commercial	Space frame
New Haven	*David S. Ingalls Rink,Yale University*	*1956-1959*	*Eero Saarinen, Douglas Orr,Severud, Elstad, Krueger*	*Component: campus*	*Arched support of cable net*
FLORIDA					
Jacksonville	Veterans Memorial Coliseum	1958-1960	A. Eugene Cellars & George R. Fisher	Component: civic	Circular dome
GEORGIA					
Athens	University of Georgia Coliseum (Stegeman Coliseum)	1964	Cooper, Bartlett, Skinner, Woodbury & Cooper; Chastain & Tindel	Component: campus	Paraboloid
Atlanta	Omni	1968	Thompson, Ventulett & Stainback	Component: commercial	Flat truss
Macon	Macon Coliseum Centreplex	1967-1968	W. P. Thompson, Jr.	Independent: centroidal	Hip roof
ILLINOIS					
Carbondale	SIU Arena, Southern Illinois University	1962-1964	Perkins & Will, Chicago	Component: campus	Ovoid dome
Champaign	Assembly Hall, University of Illinois	1959-1963	Harrison & Abramowitz; Amman & Whitney	Component: campus	Circular dome
Chicago	*Chicago Arena (Chicago Riding Club)*	*1924*	*Rebori, Wentworth,Dewey & McCormick*	*Independent: street*	*Monitor roof*
Chicago	Chicago Coliseum	1897-1900	Frost & Granger; E.C. & R.M. Shankland	Independent: street	Monitor roof

Chicago	Chicago Stadium	1929	Eric Hall, Hall, Lawrence & Ratcliffe	Independent: street	Pitched roof
Chicago	International Amphitheatre	1934	Abraham Epstein	Component: agricultural	Monitor, pitched roof
Evanston	*McGaw Memorial Hall, Northwestern University*	*1952-1953*	*Holabird & Root & Burgee*	*Component: campus*	*Pitched roof*
Springfield	*State Fair Coliseum*	*1901*	*Reeves & Baillie, Peoria*	*Component: fairgrounds*	*Oval drum*
INDIANA					
Evansville	Roberts Municipal Stadium-Arena	1956	Edmund L. Hafer & Associates	Independent: centroidal	Pitched roof
Fort Wayne	Allen County Memorial Coliseum	1949-1952	A. M. Strauss	Component: agricultural	Pitched roof
Indianapolis	Hinkle Field House Butler University	1927-1928	Fermor, Spencer Cannon, Indianapolis	Component: campus	Arched roof
Indianapolis	Indiana State Fair Coliseum	1935-1939	Russ & Harrison	Component: agricultural	Pitched roof
Notre Dame	University of Notre Dame Athletic and Convocation Center (Joyce Center)	1966-1968	Ellerbe Architects	Component: campus	Ovoid dome
Terre Haute	Indiana State University Arena	1962	Miller, Vrydagh, Miller	Component: campus	Flat truss
West Lafayette	Mackey Arena Purdue University	1966	Walter Scholer & Associates, Lafayette; American Bridge Division, U.S.Steel Corporation	Component: campus	Circular dome
IOWA					
Ames	James H. Hilton Coliseum, Iowa State University (Iowa State Center)	1956	Crites & McConnell	Component: campus	Flat truss
Des Moines	Des Moines Veterans Memorial Auditorium	1954-1955	Brooks-Borg, Ketterer Associates; Wetherell and Harrison; Tinsly, Higgins and Lighter	Component: civic	Pitched roof

Iowa City	University of Iowa Field House	1926	Proudfoot, Rawson and Souers, Des Moines	Component: campus	Pitched roof
KANSAS					
Lawrence	Allen Field House, University of Kansas	1951-1955	Charles Marshall, State Architect, Topeka	Component: campus	Pitched roof
Manhattan	Ahearn Field House, Kansas State University	1950-1951	Charles Marshall, State Architect	Component: campus	Pitched roof
Wichita	Roundhouse (Henry Levitt Arena), Wichita State University	1955	Lorentz, Schmidt, McVay and Peddie	Component: campus	Pitched roof
KENTUCKY					
Bowling Green	E.A. Diddle Arena, Western Kentucky University	1963	R. Ben Johnson, Owensboro, Kentucky; R. Wilkie, Evansville, Indiana	Component: campus	Circular drum
Louisville	Freedom Hall Coliseum, Kentucky Fair and Exposition Center	1950-1956	Fred Elswick; Joseph & Joseph	Component: agricultural	Arched roof
LOUISIANA					
Baton Rouge	Pete Maravich Assembly Center, Louisiana State University	1968-1971	Robert M. Coleman III and John Wilson	Component: campus	Ovoid dome
New Orleans	Louisiana Superdome	1967 1971-1975	Curtis & Davis; W. Norman Nolan and Nolan; Edward B. Silverstein and Associates; Sverdrup & Parcel	Independent: centroidal	Circular dome
New Orleans	New Orleans Municipal Auditorium	1929-1930	Favrot and Livaudais	Component: civic	Arched roof
Shreveport	Hirsch Memorial Coliseum, Louisiana State Fair	1952-1954	Unknown	Component: agricultural	Oval dome
MARYLAND					
Baltimore	Baltimore Civic Center	1962	A. G. Odell, Jr., and Associates	Component: civic	Flat truss
College Park	William P. Cole, Jr. Student Activities Building, University of Maryland (Cole Field House)	1955	Hall, Border & Donaldson, Baltimore	Component: campus	Arched roof

MASSACHUSETTS					
Boston	Boston Arena	1909-1910	Funk & Wilcox	Independent: street	Pitched roof
Boston	Boston Garden	1927	Funk & Wilcox	Independent: street	Pitched roof
Springfield	Eastern States Exposition Coliseum	1916	James H. Ritchie, Albert Taylor	Component: agricultural	Gambrell roof, monitor
MICHIGAN					
Ann Arbor	Crisler Arena, University of Michigan	1965-1967	Kenneth C. Black & Associates; Daniel Dworsky & Associates	Component: campus	Circular dome
Ann Arbor	Yost Field House	1923-1924	Smith, Hinchman & Grylls	Component: campus	Pitched roof
Detroit	Cobo Arena	1956	Giffels, Vallet & Gino Rossetti	Component: civic	Circular drum
Detroit	Michigan State Fair Coliseum	1922-1926	Lynn W. Fry, State of Michigan architect	Component: agricultural	Arched roof
Detroit	Olympia Stadium	1927	C. Howard Crane	Independent: street	Pitched roof
East Lansing	Jenison Field House, Michigan State University	1940	Bowd & Munson	Component: campus	Pitched roof
MINNESOTA					
Bloomington	Metropolitan Sports Center Arena	1966	Haarstrick, Lundgren & Associates	Component: commercial	Flat truss
Minneapolis	Minneapolis Auditorium	1925-1927	Croft & Boerner	Component: park	Pitched roof
Minneapolis	University of Minnesota Field House (Williams Arena)	1927- 1928	C.H. Johnston	Component: campus	Arched roof
St. Paul	St. Paul Auditorium	1903-1907	A.H. Stem; Reed & Stem; renovation ca. 1930 by Ellerbe	Independent: street	Arched roof

St. Paul	St. Paul Civic Center	1973	Convention Center Architects, Inc.; William Brooks Cavin, Jr.; Haarstrick, Lundgren & Associates	Component: civic	Circluar drum
St. Paul	St. Paul Municipal Auditorium Arena	1932	Cap Wigington	Independent: street	Arched roof
MISSOURI					
Kansas City	American Royal Livestock Coliseum	1920 1962	Black & Veatch, Kansas City (renovation)	Independent: incidental	Monitor roof
Kansas City	Municipal Auditorium Arena	1929-1936	Hoit, Price & Barnes; Gentry Voskamp & Neville, Associated Architects	Component: civic	Pitched roof
St. Louis	Henry W. Kiel Auditorium	1926-1927 1932-1938	Louis LaBeaume & Eugene S. Klein for the Plaza Commission	Component: civic	Pitched roof
St. Louis	St. Louis Arena	1929	G. Kiewitt, Herman Max Sohrmann	Component: agricultural	Ovoid dome
St. Louis	St. Louis Coliseum	1908	Frederick C. Bonsack	Independent: street	Arched roof
NEBRASKA					
Omaha	Omaha Civic Auditorium	1954	Leo A. Daly	Component: civic	Arched roof
NEW HAMPSHIRE					
Hanover	*Leverone Field House, Dartmouth College*	*1961 1962 1965*	*Pier Luigi Nervi*	*Component: campus*	*Arched roof*
Hanover	*Rupert Thompson Arena, Dartmouth College*	*1967 1973 1975*	*Pier Luigi Nervi*	*Component: campus*	*Arched roof*
NEW JERSEY					
Atlantic City	Atlantic City Convention Center	1927-1929	Cook & Blount; Lockwood Greene Co., Boston	Independent: street	Arched roof
Princeton	*Hobart Baker Memorial Skating Rink*	*1921-1923*	*Coy and Rice*	*Component: campus*	*Pitched roof*
NEW MEXICO					
Albuquerque	Albuquerque Civic Auditorium	1956	George Pearl	Component: civic	Circular dome

Albuquerque	University Arena, University of New Mexico	1965-1966	Van Dorn Hooker & Joe Boehning	Component: campus	Flat truss
NEW YORK					
Buffalo	Buffalo Memorial Auditorium	1938-1940	Green & James	Independent: street	Pitched roof
New York	*Barnum's Great Roman Hippodrome (MadisonS quare Garden after 1879)*	*1874*	*P.T. Barnum; New York & Harlem and New York & New Haven Railroads)*	*Independent: street*	*Tent wuthin walls*
New York	*Franconi's Hippodrome*	*1853*	*Henri Franconi*	*Independent: street*	*Tent*
New York	Hippodrome	1905	Fred Thompson	Independent: street	Pitched roof
New York	Madison Square Garden	1889-1891	Stanford White, McKim, Mead & White	Independent: street	Pitched roof
New York	Madison Square Garden	1925	Thomas Lamb	Independent: street	Pitched roof
New York	Madison Square Garden	1968	Charles Luckman Associates	Component: commercial	Circular drum
New York	*Sunnyside GardenArena (Queens)*	*1925*	*Frank Jay Gould? conversion to arena*	*Independent: street*	*Pitched roof*
Rochester	*Rochester Community War Memorial*	*1953-1955*	*Leo A. Waasdorp*	*Component: civic*	*Pitched roof*
Syracuse	Onondaga County War Memorial	1950-1951	Edgarton & Edgarton	Independent: street	Arched roof
Uniondale	*Nassau Veterans Memorial Coliseum*	*1969-1972*	*Welton Becket & Associates*	*Independent: centroidal*	*Oval drum*
NORTH CAROLINA					
Charlotte	Charlotte Coliseum	1955-1957	Odell Associates	Independent: centroidal	Elliptical dome
Durham	Cameron Indoor Stadium, Duke University	1939-1940	Office of Horace Trumbauer; Julian Abele?	Component: campus	Monitor roof
Greensboro	Greensboro Coliseum	1959	McMinn, Norfleet & Wicker	Independent: incidental	Arched roof

Raleigh	J. S. Dorton Arena (Livestock Judging Arena) North Carolina State Fair	1952	Matthew Nowicki, W. H. Deitrick; Severud, Elstad & Krueger	Component: agricultural	Paraboloid
Raleigh	Reynolds Coliseum Arena, North Carolina State University	1942-1949	A.C. Lee	Component: campus	Clerestoried roof
OHIO					
Athens	Convocation Center, Ohio University	1968	Brubaker & Brandt, Columbus	Component: campus	Circular dome
Cincinnati	Cincinnati Gardens	1948-1949	A.M. Kinney, Max Bohm	Independent: centroidal	Pitched roof
Cleveland	Cleveland Arena	1937	Warner & Mitchell, Cleveland	Independent: street	Monitor roof
Cleveland	Cleveland Public Auditorium	1921-1922	Frederick Betz, J. Harold MacDowell, Frank R. Walker	Component: civic	Pitched roof
Columbus	St. John Arena, Ohio State University	1954-1956	Howard D. Smith, University Architect	Component: campus	Dome in rectangle
Dayton	Dayton Arena, University of Dayton	1967-1969	Pretzinger & Pretzinger, Dayton	Component: campus	V-shaped, multipart
Toledo	*Toledo Arena*	*1947*	*Wayne Tolford*	*Independent: commercial*	Pitched roof
OKLAHOMA					
Oklahoma City	Oklahoma State Fair Arena	1965	Jack Scott	Component: agricultural	Circular drum
OREGON					
Corvallis	Gill Coliseum Oregon State University	1949	Jones and Marsh, Portland	Component: campus	Arched roof
Eugene	McArthur Court, University of Oregon	1926-1927	Lawrence & Holford	Component: campus	Pitched roof
Portland	Portland Memorial Coliseum Arena	1960	Myron Goldsmith, Skidmore, Owings & Merrill	Independent: commercial	Flat truss
Portland	*Portland Public Auditorium*	*1912-1917*	*Joseph H. Freedlander*	*Component: civic*	*Pitched roof*

PENNSYLVANIA					
Harrisburg	Farm Show Large Arena	1937-1939	Verus T. Ritter	Component: agricultural	Pitched roof
Hershey	*Hershey Arena*	*1936-1938*	*Roberts & Schaefer; Anton Tedesko*	*Component: commercial*	*Arched roof*
Philadelphia	Arena	1920	George F. Pawling	Independent: commercial	Pitched roof
Philadelphia	Municipal Auditorium (Convention Hall)	1929-1931	Philip H. Johnson	Component: civic	Arched roof
Philadelphia	Palestra	1925-1928	Day & Klauder	Component: campus	Monitor roof
Philadelphia	Spectrum	1966-1967	Skidmore, Owings & Merrill, Myron Goldsmith, Michael Pado, Albert Lockett; Tizian Associates	Component: commercial	Oval drum
Pittsburgh	Civic Arena	1958-1961	Mitchell & Ritchey; Ammann & Whitney	Component: civic	Circular dome
RHODE ISLAND					
Providence	Providence Civic Center	1971-1972	Ellerbe Architects	Component: civic	Flat truss
SOUTHCAROLINA					
Clemson	Littlejohn Coliseum, Clemson University	1968	HOK Sport; Michael Keeshen & Associates; James Barker	Component: campus	Flat truss
Columbia	Carolina Coliseum, University of South Carolina	1965-1968	Lyles, Bissett; Carlisle & Wolf, Columbia	Component: campus	Flat truss
Greenville	Memorial Auditorium	1958	Joseph G. Cunningham & Lewis J.Walker	Independent: street	Pitched roof
TENNESSEE					
Memphis	Mid-South Coliseum	1964	Furbringer & Ehrman; Merrill G. Ehrman; Robert Hall; Vandenberg & Linklater, Associates	Independent: centroidal	Circular dome
Nashville	Memorial Gymnasium, Vanderbilt University	1952 1965-1967	Edwin Keeble renovations	Component: campus	Unknown
Nashville	Municipal Auditorium	1959-1962	Thomas Scott Marr	Component: civic	Circular dome

TEXAS					
Dallas	Memorial Auditorium	1910	Unknown	Unknown	Unknown
Dallas	Memorial Auditorium (Dallas Convention Center)	1956-1957	George L. Dahl	Component: civic	Circular
Dallas	SMU Coliseum (Moody Coliseum)	1956	Harwood K. Smith	Component: campus	Flat truss
Dallas	State Fair of Texas Coliseum	1910	C. D. Hill; 1936 partial renovation by George Dahl	Component: agricultural	Unknown
Dallas	State Fair of Texas Coliseum	1959	Harper & Kemp	Component: agricultural	Flat truss
Fort Worth	Fort Worth/Tarrant County Convention Center Arena	1968	Herman G. Cox; Parker Croston & Associates; Preston M. Geren; Hueppelsheuser & White; Wilson, Patetrson, Sowden, Dunlap & Epperly, all of Fort Worth	Component: civic	Circular
Fort Worth	Will Rogers Memorial Center	1936-1937	Wyatt C. Hedrick; Herman P. Koeppe, Elmer G. Withers Architectural Co., Herbert M. Hinckley	Component: civic	Arched, splayed roof
Houston	Harris County Domed Stadium (Astrodome)	1962-1965	Wilson, Morris, Crain & Anderson; Lloyd, Morgan & Jones; Walter P. Moore & Associates	Independent: centroidal	Circular dome
Houston	Hofheinz Pavilion, University of Houston	1967-1970	Lloyd, Morgan & Jones	Component: campus	Flat truss
Houston	National Democratic Convention (Sam Houston Hall)	1928	Unknown	Independent: street	Arched roof
Houston	Sam Houston Coliseum and Music Hall	1935-1937	Alfred C. Finn	Component: civic	Pitched roof
Lubbock	Lubbock Municipal Auditorium	1956	Haynes & Kirby	Independent: street	Oval dome
San Antonio	Joe & Harry Freeman Coliseum Arena	1947-1950	Bartlett & Cocke; Phelps & DeWees & Simmons; Atlee B. & Robert M. Ayers	Component: agricultural	Oval dome

San Antonio	San Antonio Convention Center Arena (HemisFair Arena)	1968	Tom Noonan, Noonan & Krocker, San Antonio; Boone Powell	Component: civic	Circular drum
UTAH					
Salt Lake City	Jon M. Huntsman Center, University of Utah	1969	Young, Fowler & Associates, Salt Lake City	Component: campus	Circular dome
VIRGINIA					
Blacksburg	Cassell Coliseum, Virginia Technical University	1961-1964	Carneal & Johnson	Component: campus	Arched roof
Charlottesville	University Hall, University of Virginia	1965	Baskerville & Sons, Richmond; Anderson, Beckwith and Haibel, Boston	Independent: centroidal	Circular dome
WASHINGTON					
Seattle	Civic Auditorium and Ice Arena	1925-1928	Shack, Young & Myers; remodeled 1962 to opera house by James J. Chiarelli and B. Marcus Priteca	Component: civic	Pitched roof
Seattle	Hec Edmondson Pavilion University of Washington	1926-1927	Bebb & Gould	Component: campus	Pitched roof
Seattle	Seattle Center Coliseum (Key Arena)	1962	Paul Thiry	Component: civic	Rectangular ridge truss
WEST VIRGINIA					
Charleston	*Charleston Civic Center Coliseum*	*1958-1959 1968*	*Walter Martens, Charleston*	*Independent: civic*	*Flat truss*
Morgantown	West Virginia University Coliseum	1970	C.E. Silling & Associates	Component: campus	Circluar dome
WISCONSIN					
Madison	Dane County Veterans' Memorial Coliseum	1966-1967	Law, Law, Potter & Nystrom	Component: agricultural	Circluar dome
Madison	University of Wisconsin Field House	1929-1930 1936	Arthur Peabody in consultation with Paul Cret renovation	Component: campus	Pitched roof
Milwaukee	Milwaukee Arena	1950	Eschweiler & Eschweiler, Milwaukee	Independent: street	Arched roof
Milwaukee	*Milwaukee Auditorium*	*1909*	*Ferry & Clas*	*Component: civic*	*Hip roof*

WYOMING					
Laramie	University of Wyoming Field House	1951	Porter & Bradley, Cheyenne; Goodrich & Wilking, Casper	Component: campus	Arched roof
CANADA					
ALBERTA					
Calgary	Calgary Stampede Corral Arena	1949-1950	J.M. Stevenson, J.A. Scarr	Component: agricultural	Arched roof
Edmonton	Edmonton Stock Pavilion (Edmonton Exhibition Association Arena; Edmonton Gardens)	1910-1913 1950	Rollie Lines renovation	Component: agricultural	Pitched roof
BRITISH COLUMBIA					
Vancouver	Pacific Coliseum	1966-1967	W.K. Noppe	Component: agricultural	Circular
MANITOBA					
Winnipeg	Winnipeg Arena	1954-1955	Moody & Moore, Winnipeg	Component: commercial	Pitched roof
ONTARIO					
Cambridge	Galt Arena Gardens	1921-1922	F.C. Bodeley	Component: park	Pitched roof
Ottawa	Aberdeen Pavilion	1898	Moses C. Edey	Component: agricultural	Arched roof
Ottawa	Ottawa Arena/Auditorium	1923	Architect unknown; Thomas James, Contractor	Unknown	Pitched roof
Ottawa	Ottawa Civic Center Arena	1967	Gerald Hamilton and Associates, Craig & Kohler	Component: civic	Pitched roof
Toronto	Arena Gardens (Mutual Street Arena)	1911-1912	F.H. Herbert; Ross & MacFarlane	Independent: street	Pitched roof
Toronto	Maple Leaf Gardens	1931	Ross & MacDonald; Jack Ryrie and Mackenzie Waters	Independent: street	Pitched roof
Windsor	*Windsor Arena*	*1924*	*A.W. Connor & Co.; H.J. Caldwell*	*Independent: street*	*Gambrell, monitor roof*

QUEBEC					
Montreal	Forum	1924-1926 1968	John S. Archibald reconstruction Ken Sedleigh	Independent: street	Pitched roof
Montreal	Mount Royal Arena	1911 1919-1920	Unknown	Independent: street	Pitched roof
Montreal	Westmount Arena	1898	R.M. Rodden or Cajetan Dufort?	Independent: street	Pitched roof
Quebec City	Colisee Pepsi Arena	1954	Robert Blatter, Fernand Caron, Pierre Renfret	Independent: centroidal	Flat truss

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