1, 2. Louis Kahn and Anne Tyng, City Tower project, later scheme, 1956–57, and polystyrola from Gyorgy Kepes, *The New Landscape in Art and Science*, 1954

Sarah Williams Ksiazek
Critiques of Liberal Individualism: Louis Kahn's Civic Projects, 1947–57

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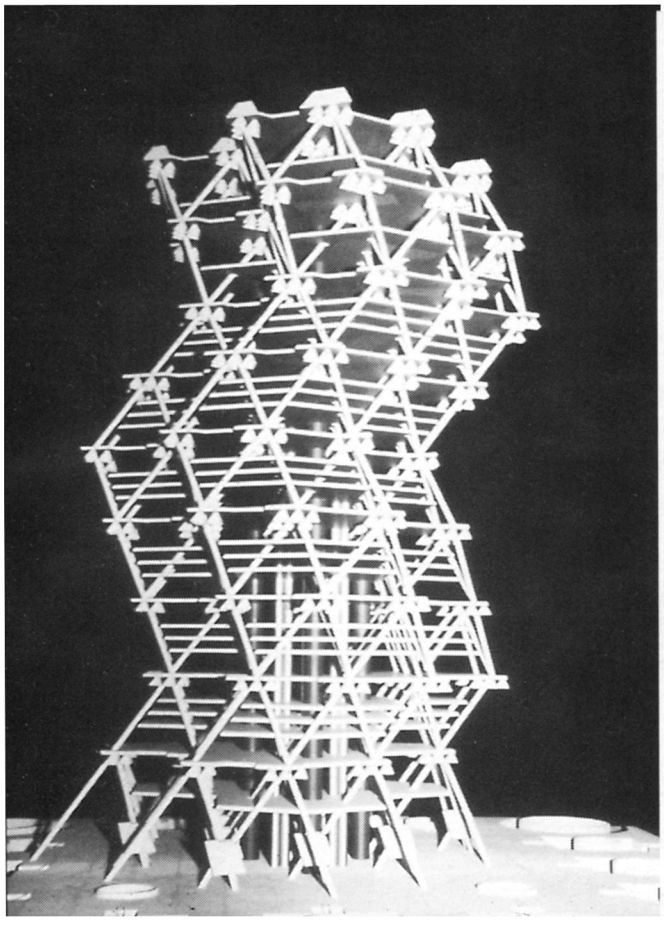
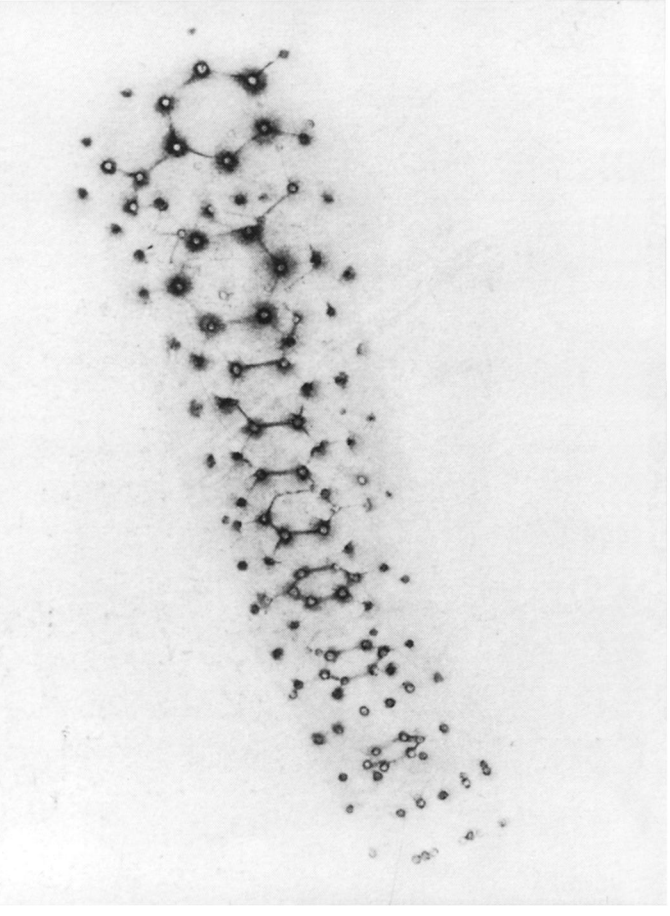
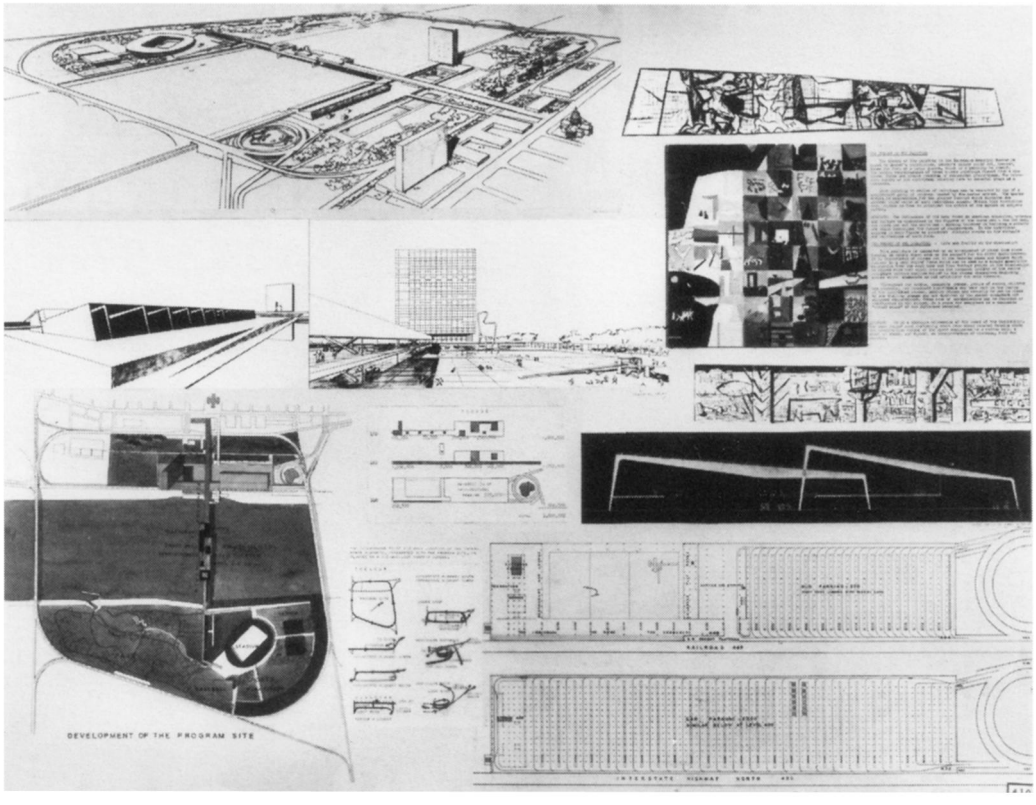
Assemblage 31: 56–79

Most practitioners of the early modern movement espoused some version of the doctrine that within architectural praxis was the potential to advance social change.[1] Louis Kahn was a committed participant in the modern movement for nearly twenty years, from the mid-1930s until the early 1950s. Yet in the literature on his work, the connection of Kahn's activities as a city planning activist and housing reformer to his monumental civic projects of the early to mid-1950s remains unclear.[2] But these connections begin to emerge if we examine his little-known competition entry for the Jefferson National Expansion Memorial of 1947, in which Kahn began to explore how he might embody the social convictions he had developed as a reformer in public architecture. Specifically, he designed the Jefferson Memorial so that its users would engage as members of a participatory community in which the common good took precedence over individual, autonomous freedom. In a very different manner, this ideal also drove the design of two important civic projects for Kahn's hometown, Philadelphia: his proposal (designed with Anne Tyng) for a new city hall, City Tower, of 1952–57 and his AFL-CIO Medical Services Building of 1954–57. In these two works Kahn extended the agenda he had formulated while working as a modernist in adopting a symbolic language inspired by the

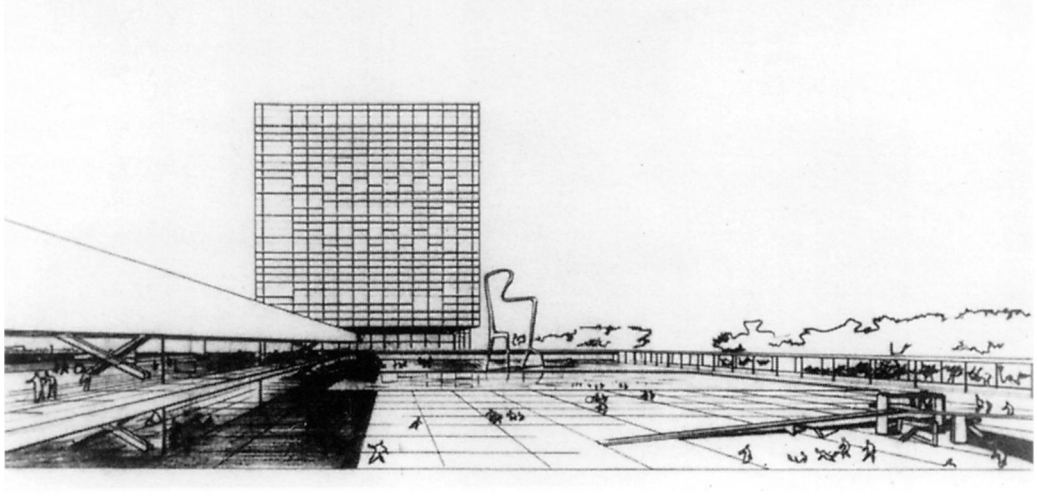




3. Louis Kahn, Jefferson National Expansion Memorial, 1947, competition board 1



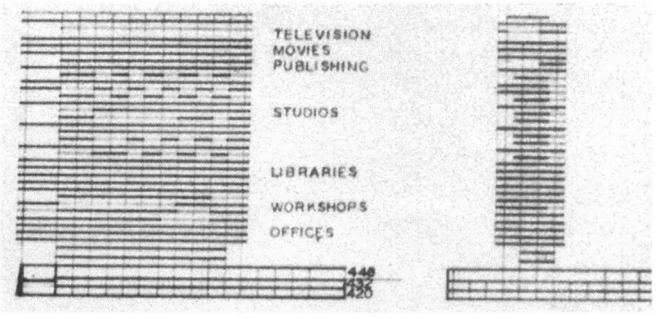
4. Agora for the Jefferson Memorial, perspective



works and ideas of a group of architects and engineers of whom the best known is R. Buckminster Fuller.

If we take ideology to be "a chronic effort to correct sociopsychological disequilibrium,"[3] then Kahn was attracted to the ideas of Fuller and his colleagues because their forms connoted an ideology that, however obliquely, promised social change. Embedded in the tetrahedral, hexagonal, and cubic forms Kahn employed was the message that new technologies bore the potential to effect such change; equally important, these geometries connoted an almost transcendental organic connectedness of all humans to nature and to each other as well. Thus did Kahn transform the communal ideals first explored in his Jefferson Memorial entry into a symbolic public architecture.

When the Jefferson National Expansion Memorial competition for St. Louis was held in 1947, among the one hundred seventy-one teams that participated were those of Eero Saarinen and of his forty-six-year-old friend and contemporary, Louis Kahn.[4] Saarinen's winning proposal for an arched "gateway" organized the spreading view of the Mississippi River and the historic Eads Bridge. This monumental sculpture was set in the pastoral verdure of a public park designed in the manner of Frederick Law Olmstead, with winding paths and planted trees where individuals or small groups might spend time in quiet, reflective isolation. Kahn, by contrast, proposed something more public and more urban. At two ends would be civic buildings; near the river was a glazed, multileveled circulation spine that allowed views of the Mississippi beyond. The central focus of the project was an agora in the manner of Le Corbusier's widely acclaimed reconstruction scheme for the city of St.-Dié in France.[5] But unlike Le Corbusier, Kahn penciled in numerous figures in this piazza, and he included a sculptural composition of ramps and bridges on which local children might play. This was a complex where the citizens of St. Louis could *meet*.

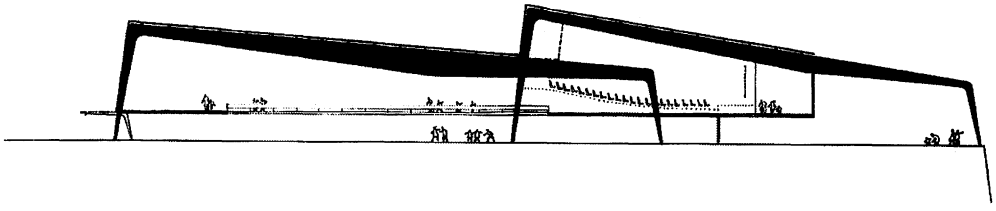


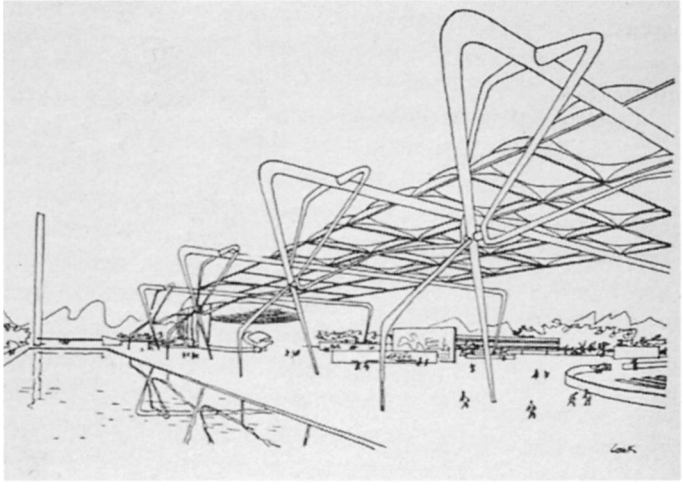
5. Laboratory of Education for the Jefferson Memorial, sections from competition board 2

Communal gathering was also the theme of his designs for the large figurative murals that he projected for important sites within the square. One mural would be painted with pictograms of a red, a black, and a white man intended to challenge the segregationist policies of the City of St. Louis in emphasizing that not one but three races had contributed to the development of American culture, "working together to symbolize the forces of cooperation."[6] A second mural would depict historical scenes from life on the Mississippi River. It was to be sculpted from small stone blocks that would each contribute to a single, large, monumental composition. Kahn rhapsodically described how local residents would participate in its construction; evoking the structure of medieval guild collaborations, he wrote how a "master artist" would oversee "community groups, groups of school children and students, and prominent individuals" who "would take part in the laying of the individual stones." The finished art work would, he concluded, "record these acts of citizen participation."

Through neighborhood participation, representational imagery, and site planning, Kahn's Jefferson Memorial would encourage the people of St. Louis to recognize themselves as — indeed, to behave as — members of a community.

6. UNESCO center for the Jefferson Memorial, section





7. Kahn, proposed civic center, drawing from "Monumentality," 1944

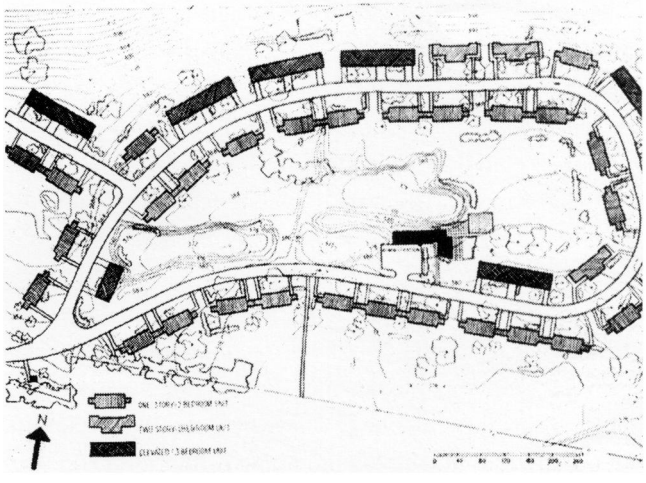
The two major civic buildings he projected embodied related ideals. In a skyscraper that Kahn shamelessly adapted from Le Corbusier's towers for Algiers, he placed what he called a Laboratory of Education. On the bottom floor would be the local headquarters of the Citizen's Council for City Planning, an organization with chapters in major eastern cities to which Kahn belonged. The function of the Citizen's Council was to provide an effective forum, by means of New England–style "town meeting," for private individuals to contribute and shape the public process of urban planning. On the upper floors of the Laboratory of Education were provisions for spaces housing all technologies of communication in existence in 1947: a public library, radio and television broadcasting stations, a newspaper office, and a film studio. To the north would be a Center for UNESCO (United Nations Educational, Scientific, and Cultural Organization), which had been founded two years earlier to promote what officials called a "planetary society" by institutionalizing international cultural exchange.[7] Through the television and radio programs broadcast, films produced, newspapers published, telegraphs and telephone calls received, the Laboratory of Education would be a clearinghouse for national and international communication, a facilitator of UNESCO's "planetary culture."

The activist program apparent in Kahn's entry for the Jefferson Memorial comes as no surprise when we consider the political causes that he supported at the time. In addition to the Citizen's Council, in 1946 Kahn also attended meetings of an organization dedicated to replacing each nation's legislative autonomy with a single world government and collected copies of the organization's monthly bulletin, the *World Government News*.[8] The following year, Kahn joined the Progressive Citizens of America (PCA), a left-wing third political party founded by Harry Truman's former Secretary of Agriculture, Henry Wallace.[9] Truman — whose nationalism had been stoked by the heightening tensions of the Cold War — had fired Wallace in 1946 for criticizing the President's increasingly combative stance toward the Soviet Union. A principal platform of the PCA was internationalist cooperation mediated by a powerful United Nations.

Kahn intended metaphorically to convey his social ideals of local participation and world community in architectural

form. His UNESCO center scheme is extremely tentative, but we can deduce a low-slung, long-span steel-and-glass exhibition hall, with two interlaced spanning elements that contain a vast open area and auditoria suspended from the ceiling. The scheme clearly expands on ideas Kahn first broached in 1944 in his essay on a new monumentality.[10] There, like a good modernist, he recommended that the architect express the Zeitgeist by pushing the tectonic possibilities of recently developed materials. But Kahn also wrote, in the middle of long disquisitions on the engineering of structures, that "this generation is looking forward to its duty and its benefit to build for the masses with its problems of housing and health, . . . the nation has adopted the beginnings of social reform."[11] Seemingly a non sequitur, Kahn was grappling to express the idea that in creating structurally innovative architecture, the architect might design in civic form a symbolic analogue to radical social change. The structural innovations of the UNESCO building would represent the social changes that his agora, murals, and Laboratory of Education might enact.

Kahn's preoccupation with communal life may have originated in his experiences as an immigrant child in the Jewish ghettos of Philadelphia.[12] But it was in the 1940s, during his involvement in the public housing movement, that this shadowy nostalgia for a remembered childhood became an activist ideal. During these years Kahn was working in collaboration with the German émigré architect Oscar Stonorov, who was his partner from 1941 to 1947.[13] Stonorov came from Frankfurt and admired Ernst May's work there; before immigrating to the United States in 1931, he had also lived in Paris and worked for Le Corbusier and for the Marxist architect André Lurçat.[14] Like Lurçat's, Stonorov's commitment to the modern movement was founded on ideological convictions; he believed that the architect should not work simply for those who hired him but for the greater social good. Stonorov specifically emphasized the importance of communal identity. "Housing," he argued, "was not a question of naked shelter only"; instead, the architect's task was to "reorganize rotten communities, to make them stable, sane, and healthy societies."[15] In the Carver Court housing of 1943 Kahn and Stonorov, working with George Howe, gave form to such ideals.[16] The architects took advantage of the previous configuration of the site, a former racetrack, to arrange multiple dwellings in a loop, like a New England village arrayed around the town green. Thus were residents constantly reminded that they were participants in a collectivity. Typical of such housing projects was a "community building" where local residents could meet; Kahn and Stonorov placed their community building in an especially prominent location in the center of the loop.



8. George Howe, Louis Kahn, and Oscar Stonorov, Carver Court, Coatesville, Pennsylvania, 1943, plan

Stonorov's communal ideals had emerged directly from his contacts with the avant-garde in Europe. These social convictions were reinforced, however, when he settled in the United States and he became involved in a discourse of social critique propagated by the American writer Lewis Mumford and by Mumford's companion and Stonorov's

collaborator, the housing activist Catherine Bauer.[17] Bauer believed in the importance of local collective action as a means of counteracting the unwieldy power of the state that had been brought about in the United States under industrial capitalism. Such action, she argued, could be encouraged by architects and city planners who designed according to what she called the "neighborhood unit concept." Benefits of the communal identity that would result would accrue to all members of society, Bauer believed: "All kinds of research on social disorganization and maladjustments tend to come down to the fact that we have lost a community base, at a level where personal participation, identification of individual and family with group and society, are possible."[18]

Mumford had insisted upon the importance of what he called "civil life" thirty years before, as early as 1919. Civil life, he wrote, meant "association . . . with the family, the trade union, the grange, the chamber of commerce, the professional institute, the church, the theater and the forum intermediating between the life of the individual and his life as the member of the . . . state."[19] By 1934 in *Technics and Civilization* (a book for which Bauer acted as research assistant), Mumford placed the blame for America's social problems directly on the shoulders of the capitalist system. A society dominated by technology yet based on the ideology of liberal individualism, he argued, had caused massive social dislocation and so must be rethought. Over what Mumford called people's "anarchic" drive for private profit and personal gain should be a sense of social obligation: one holds duties in return for citizenship. But people would shoulder such responsibilities, Mumford believed, only if they felt solidly connected to the community where they lived. Urban forms that promoted a vital communal life would thus advance these goals.[20]

In the writings of Mumford and those surrounding him in America in the 1930s and 1940s[21] lie the spiritual, if not actual, antecedents to the philosophy of communitarianism (as versus classical liberalism) that, recently, has been theorized in the work of writers such as Michael Walzer, Michael Sandel, Charles Taylor, and Jürgen Habermas.[22] Habermas is the most conservative of the group, insisting that promise remains in the Enlightenment ideal of a liberal participatory democracy. But the others stress that in capitalist countries such as the United States, the emphasis on individual rights — what Walzer characterizes as "the lively longing for personal pleasure" — has created socially destructive power imbalances that erode the welfare of society at large, or, as Walzer puts it, "the lively sense of oneself as participant in a free state, concerned for the common good."[23] Taylor argues that the classical liberal emphasis on individual freedom is specious because a self is defined through public identity; Sandel concurs that self or selves are created only through one's roles "as citizens of a country, or members of a movement, or partisans of a cause."[24]

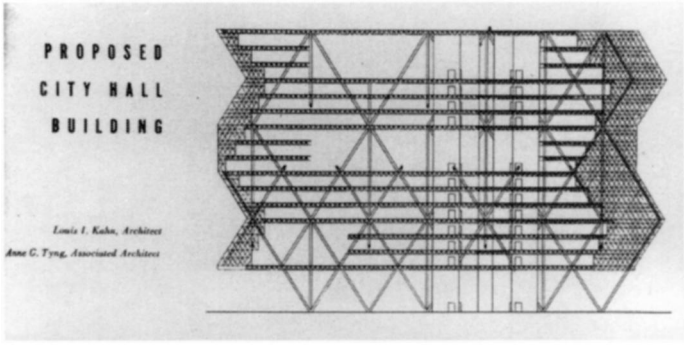
No one would venture to claim Louis Kahn's Jefferson Memorial entry as an unsung work of great art — its agenda was less aesthetic than political. Kahn was using the competition to explore protocommunitarian ideals that he had absorbed from Stonorov, Mumford, and Bauer. Kahn's agora, communally produced murals, and offices of the Citizen's Council were meant to encourage participation in the neighborhood of St. Louis, while the UNESCO headquarters and "Laboratory" for communications technologies might facilitate the same kind of cooperation at an international scale.

Most scholars assume that as Kahn began to develop a mature vocabulary in the early 1950s, with projects such as the oft-discussed Yale Art Gallery of 1951–53 and the Trenton Bath House of 1955, whatever activist ideology he had espoused dissipated into questions of form that were philosophical, historical, mystical, and certainly more obtuse. But between the Yale Art Gallery and the Bath House came two

projects that Kahn designed for Philadelphia, neither of which has been closely studied, neither of which fits neatly into our received understanding of Louis Kahn's career. One was City Tower, his unbuilt scheme for a new city hall, which he proposed for two prominent downtown sites, first as part of a new civic center by the Schuylkill River (published in *Perspecta* in 1953), later for Reyburn Plaza adjacent to the Philadelphia's old city hall.[25] The second was a Medical Services Building for the AFL-CIO Labor Union at Thirteenth and Vine Streets, begun in 1954, finished in 1957, and demolished to make way for the Vine Street expressway in 1973.[26]

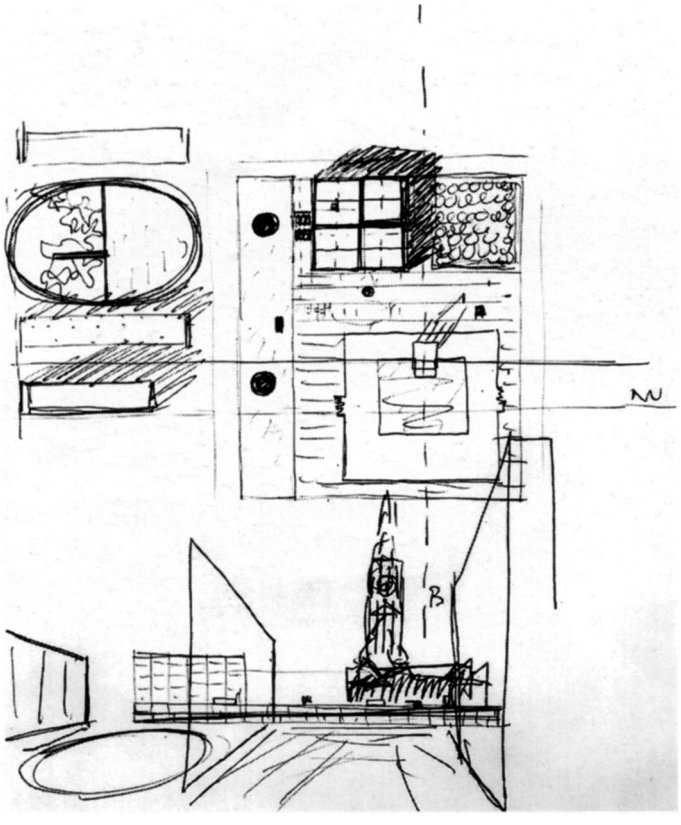
The City Tower project was begun in 1952. Its conception was to transform a tetrahedral space frame from a spanning into a space-creating structure by pulling tetrahedrons upward, vertically, into a multistoried tower.[27] In its best known version, three abutting hexagons were laced into a precast, prestressed concrete frame. Kahn wrote that the faceted, angular façade would be a three-dimensional network of tubular stainless steel; wire mesh stretched across the south and west faces would provide shade from the sun. As at his recently completed Yale Art Gallery in New Haven, services would be exposed, laid into tetrahedral slab ceilings; also as at Yale, the tower would have loftlike, open spaces that could be reconfigured according to programmatic need.

Few scholars believe that Kahn intended to build this awkward-looking thing. Indeed, many intimate that City Tower is not especially relevant to an understanding of Kahn's work, emphasizing the role in its design of his partner and companion of these years, Anne Griswold Tyng.[28] City Tower *was* originally Anne Tyng's idea,[29] but previously unpublished correspondence between the two clearly indicates that by 1954 they were collaborating as equals on the scheme. These documents also reveal that Kahn honestly wanted to build this project as Philadelphia's new city hall.



9. Kahn and Tyng, City Tower, Philadelphia, 1953, section

10. Louis Kahn, AFL-CIO Medical Service Center, Philadelphia, 1954–57



11. Kahn, analysis of sight lines toward Philadelphia's old city hall, 1954

12. Kahn, pen-and-ink sketch of old city hall, 1954

The circumstances in which Kahn and Tyng first published City Tower suggest their thoughts regarding possibilities for its erection. At the time *Perspecta* went to press in the summer of 1953, Kahn knew that Philadelphia's authorities were planning to construct either a new city hall or an annex to the old.[30] He desperately hoped for a municipal commission. His *Perspecta* article outlining a new civic center by the Schuylkill River coincided with a proposal put forward by the director of Philadelphia's City Planning Commission, Edmund Bacon, to raze the bulk of the old city hall (leaving only the tower), create a new commercial district in Center City, and relocate civic facilities to a site by the Schuylkill.[31]

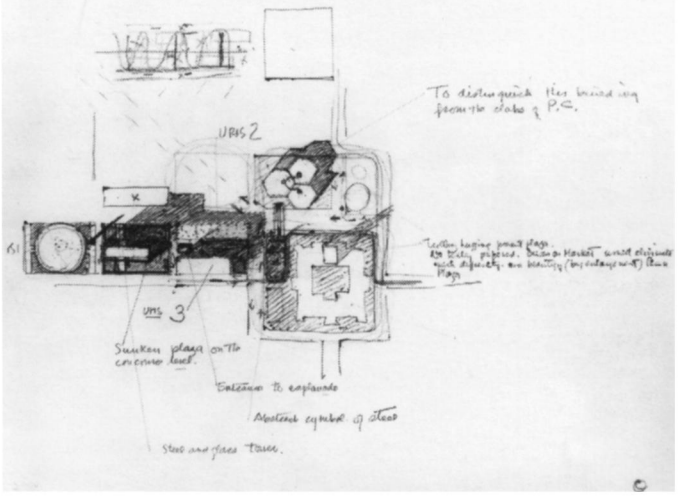
Similarly, when authorities decided to forgo this idea in 1954, opting instead to construct an annex to the old city hall on Reyburn Plaza, Kahn lobbied intensively for the chance to bring his and Tyng's proposal to fruition.[32] By then, Tyng had left Philadelphia to live in Europe. Kahn reported to her that the selection of an architect was imminent. "I cannot allow the grass to grow under my feet," he wrote, asking "how long must I wait?" for at fifty years of age he remained largely unknown. "If a building must go there, who could do better?"[33] Kahn sent letters to various city authorities including Bacon, the mayor, the managing director of the City of Philadelphia, and the head of the Redevelopment Authority.[34] To some, he suggested a competition for the project; he asked Bacon directly to be considered for the commission: "You know of my great interest in the project and the thought I have already given it."[35]

As part of his campaign to secure the commission, and in order to examine the problem in depth, in the spring of 1954 Kahn conducted a studio on the city hall annex at the University of Pennsylvania.[36] To prepare for his class, he asked Philadelphia's managing director for a copy of the program. But he then got cold feet, writing to Tyng: "It was stupid of me to show my own ambition in the matter."[37] With his Penn students, Kahn photographed the site, ana-

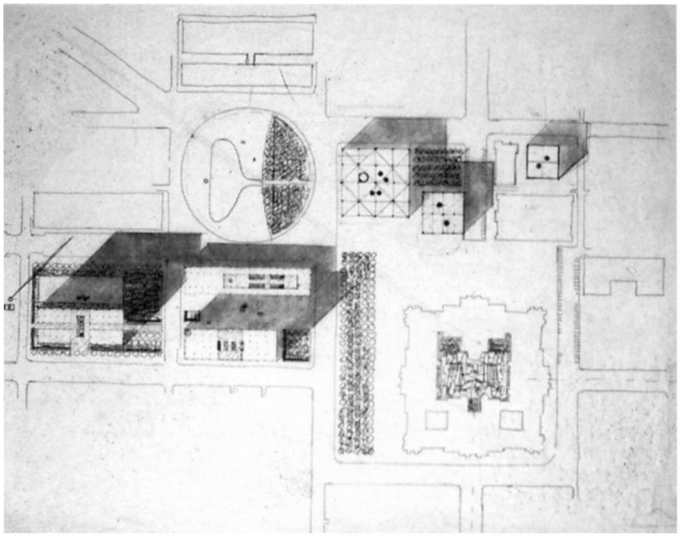
lyzed sight lines from Reyburn Plaza back toward city hall, and prepared numerous sketches of the old city hall. He wrote Tyng that a plan comprised of two squares might better suit the city's needs; the downtown site was tight and three hexagons wasted too much space. "Or," he suggested, "we could build two hexagons instead of three. What do you think?" ending: "I wish we had the commission."[38]

Such letters clearly indicate that Kahn was taking these proposals to build City Tower as Philadelphia's new city hall more seriously than has previously been assumed. Moreover, in a lecture at Tulane that same year, he made it plain that when it came to city halls or other similar public buildings, communal participation was of foremost concern. "If you think of civic," Kahn asked his audience of students, "what do you think of? You think of city hall, you think of the firehouse, the post office, you think of the other things that go into a civic center. Actually, the present tendency is not for us to meet in the city hall to discuss problems. We are not really a participating part of any meeting house, which was at one time held in what we call 'city hall.'"[39] In the context of the lecture it is clear that he spoke these words disparagingly, almost nostalgically; any city hall Kahn might build would encourage the individual in "the lively sense of oneself as participant in a free state, concerned for the common good." In his work on City Tower, Kahn still sought the ideals that had emerged in his Jefferson Memorial entry of seven years before.

Why did he imagine City Tower might be a "meeting house" that would encourage communal participation? The answer lies in the ideology that he and his colleagues believed were embedded in the forms of a space frame. Interest in space frames in the early 1950s was principally generated by an old friend of Kahn's, Buckminster Fuller. In 1949 Fuller had invented the geodesic dome and he was publicizing it by lecturing, like a peripatetic preacher, at various universities across the country, leaving versions of



13. Proposed City Hall, plan as three hexagons, 1954



14. Proposed City Hall, plan as two squares, 1954

the geodesic behind.[40] Fuller's stops included not only Yale, where Kahn taught, but many other institutions in which Kahn was involved, such as Princeton and the North Carolina State College.[41] As a result of Fuller's peregrinations, space frames had become the locus of a veritable new movement among Kahn's colleagues and friends. Douglas Haskell, Kahn's primary supporter in these years and the editor of *Architectural Forum*, published numerous articles on the topic between 1951 and 1954.[42] Two European theorists of the movement, Robert Le Ricolais of Paris and Felix Samuely of London, joined their enthusiastic voices to the discussion.

While Fuller, Le Ricolais, and Samuely argued about the best approach to space frame *design* — Fuller advocated using the geometry of the sphere; Le Ricolais employed flatter spans instead[43] — they united in their belief that the radical structures space frames could produce were uniquely suited to postwar needs. Fuller claimed his geodesics would generate "the only architectural revolution," while Le Ricolais wrote that the "structural facts" on which space frames were based "nonplussed our present knowledge of the Science of Building."[44] Felix Samuely was perhaps least circumspect of all: in an *Architectural Forum* article of 1953 he declared that "hundreds of years hence, people will see this time as one in which architecture shifted from plane [i.e., conventional structures] to space [i.e., three-dimensional structures]; and saw the birth of a new architecture."[45] Space frames had been around for a couple of generations;[46] but these engineers saw that they could take advantage of the dramatic increases in the efficiency of mass production and metal technology that had been effected by the war. The military had used aluminum space frames for light, dismountable shelters during and after World War II; both Fuller and another space-frame theorist, Konrad Wachsmann, had sold ideas to the U.S. Air Force and to the U.S. Marines.[47] The moment had come, it was reasoned, to turn wartime technologies to peacetime, domestic ends: Haskell called military technology "the negative side of a tremendous power opportunity;" Fuller, too, argued that these recent technological advances should now be employed for the social good.[48]

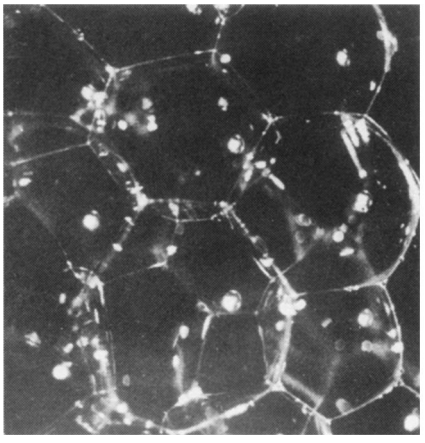
This discourse partly explains why Louis Kahn was attracted to space frames: they fit his prescription for a rationalist, structurally innovative architecture as a means to a monumentality that evoked the conditions of social change.[49] But these forms symbolized more than technological advance in a changing postwar world. Space frames like City Tower were comprised of three related geometric figures — the triangle, the hexagon, and the tetrahedron. Fuller, Le Ricolais, Samuely, and others, advocated the employment of such geometries on the grounds of their structural efficiency: less material supported loads equivalent to, or greater than, those in conventional rectilinear designs. These convictions regarding structural efficiency had come through the lessons of science, in particular, through studies of geometry in nature.

Earlier avant-garde architects had been interested in geometry in nature as well: Le Corbusier had justified his use of the golden section as a proportional guide by noting its existence in shells and other natural forms. Postwar theorists such as Fuller and Le Ricolais, however, were interested in nature-based geometries not for their proportions, but their structure. The British scientist D'Arcy Thompson's landmark 1912 study *On Growth and Form*, in which he had investigated the geometry of structure in nature, became widely read in these years after a 1951 exhibition in Thompson's honor opened at London's Institute of Contemporary Art.[50] Also influential were similar studies of organic geometries by the late-nineteenth-century German biologist Ernst Heinrich Haeckel, studies on which Le Ricolais relied and of which Anne Tyng knew as well.[51] In the States, the former Bauhaus painter Gyorgy Kepes curated an exhibition on geometric structure in nature that was shown at the Massachusetts Institute of Technology in 1951 and mounted at the Aspen

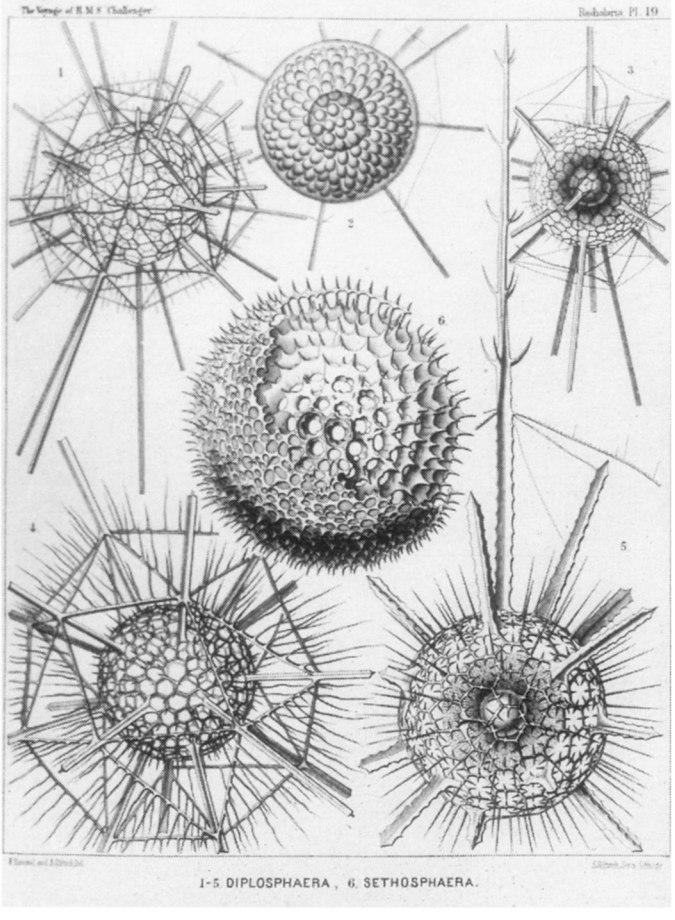
Institute's summer conference in 1953; both Tyng and Kahn were familiar with this work.[52]

Together these studies by Thompson, Haeckel, and Kepes revealed geometric compositions in a huge array of the most familiar forms: tetrahedra, octahedra, hexagons, and squares appeared in soap bubbles, in diatoms, and in radiolaria; this last, a protozoa comprised of hexagonally arranged siliceous tubes. Interest in geometry in nature was at the same time augmented by more recent discoveries under the electron microscope, which, appearing commercially in the late 1930s, had expanded such knowledge beyond the realm of the immediately visible.[53] The electron microscope showed that not only organic and inorganic matter, but even the most fundamental units of life — chemical compounds — were geometrically composed. Collectively, this research suggested to Tyng, Le Ricolais, and Fuller a comforting idea: if the reality in which we moved was chaotic and inscrutable, beneath lay a profound order of almost mystical simplicity. Le Ricolais extolled nature's "stupendous vocabulary of forms"; Fuller marveled that while the structures of chemical patterns were only now being revealed, "these wondrous actualities were always *there*, inherent in a universe of meaning."[54]

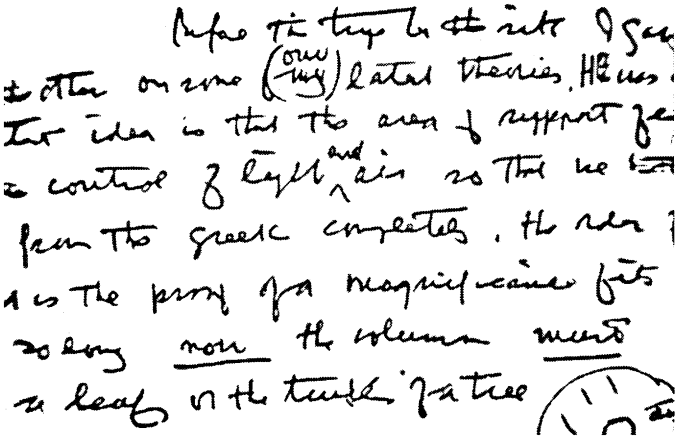
To Fuller and Tyng at least, this truth implied a social vision. If architecture could be made to reenact and symbolize this subterranean world order, the lack of fit that people felt with their world — the social maladjustment of which Catherine Bauer had complained — would, somehow, be redressed. Fuller often wrote in these years of how his geodesic domes would advance what he termed a "one-town community"; Tyng liked Fuller's ideas because they expressed what she called the flow of existence "from microcosm to macrocosm."[55] Tyng also fell deeply under the influence of a maverick British science theorist Lancelot Law Whyte, whose self-proclaimed cause was to help contemporary man "understand himself in the interest of the



15. Photograph of soap bubbles from Kepes, *The New Landscape in Art and Science*



16. Photograph of radiolaria in Kahn's files, from Ernst Haeckel, *Report of the Scientific Results of the Voyage of the H.M.S. Challenger During the Years 1873–1878*



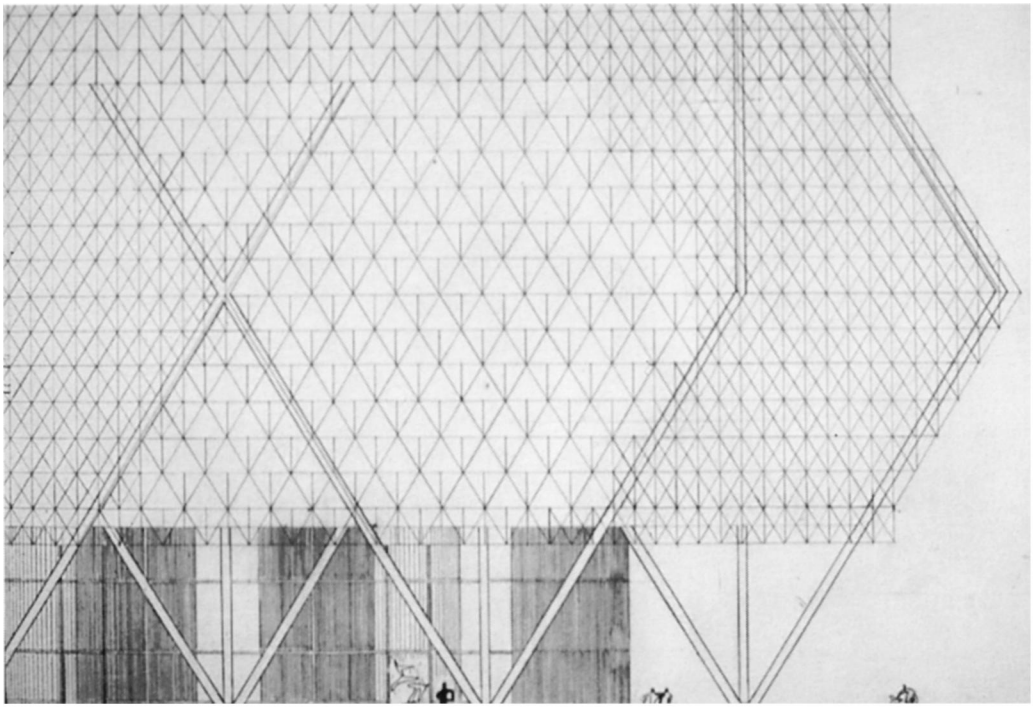
17. Letter from Kahn to Tyng, "my/our latest theories," 1954

18. Kahn's slide of the Fuller studio at Yale, 1952

development of a world community."[56] Whyte, whose work was widely read among followers of Fuller, believed that literature, art, politics, economics — indeed, all previous forms of human culture — had tried to create such a community and had failed. The only solution, he deduced, was for people to use the discoveries in technology and science to "reorganize their knowledge of nature so they may recognize themselves as part of the system of nature."

Scholars have long known that Anne Tyng was influenced by such ideas. But what about Louis Kahn? Documents indicate that in the early 1950s he was just as involved. In these years Kahn was given to presenting slides of Tyng's work in lectures on his own, and in one letter to her he referred to "my/our latest theories."[57] Moreover, Kahn sought out contacts and socialized with many of the other major protagonists of these ideas. He was close to Fuller, and when the engineer taught at Yale in the fall of 1952, Kahn kept watch on Fuller's advanced studio in which students constructed a paper geodesic. Through his contacts at North Carolina, Kahn also developed warm friendships with Felix Samuely and Robert Le Ricolais.[58] He began to collect images of radiolaria, filing them with his slides of his schemes for City Tower; he bought books on crystallography as well. Kahn knew the ideas of Lancelot Law Whyte, whose *Next Development in Man* was sent to him in 1948 by his landscape consultant, Dan Kiley; another colleague recommended it again in 1953, writing, "I like the book very much. It adds to the new optimism about the future that I connect first with Fuller."[59]

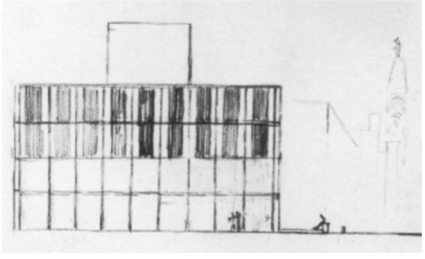
Kahn had always been attracted to a tectonic approach to architecture, but he adopted these ideas for the ideology that they implied. At exactly the moment that many scholars date his turn to a historically based vocabulary, Louis Kahn was, in fact, developing an organic philosophy of design.[60] Space frames, he wrote in 1953, came from "a closer knowledge of nature and the outgrowth of a constant search



19. City Tower, elevation at street level, 1953

for order."[61] Order became his key concept in these years; by it, Kahn meant that which structures organic form. He wrote Tyng in December 1953 that order "is *mostly* structure. . . . It is embodying that makes the structure grow into a life of fibre. *It is the seed, it is integration*."[62] Kahn's concept of order versus "design" — the central elements of his first mature philosophy of form— paralleled the double experience of nature that his colleagues admired: design, like the world humans experienced day-to-day, was incidental and erratic; order, like the world in which we truly lived, was structured and universal.[63]

Of all the architects and engineers involved in this techno-organic movement in space frames, Louis Kahn most completely connected its ideas with the problem of postwar civic space. He and Tyng believed that City Tower reenacted the true structure of the world, much as Rudolph Wittkower had argued that Renaissance architects believed their church designs embodied the harmonic proportions of the spheres.[64] And because this formal order was grounded in all humanity's shared experience of nature, it transcended cultural or national boundaries, just as UNESCO and a world government would break down barriers between cultures or nations by effecting social and political change. Kahn suggested that people would intuit the profound symbolism embedded within City Tower's forms, predicting that this clunky, odd building would eventually "reveal itself as a new Philadelphia landmark."[65] The tower would also be both pendant and antithesis to the old Beaux Arts city hall next to which it would stand: its open forms



20. Kahn, sketch of AFL-CIO building showing the old city hall in the background, 1954

21. AFL-CIO building, lobby looking toward entrance

and "non-directional" public spaces implied a democratic accessibility discouraged in monuments past.[66] These qualities Kahn and Tyng reinforced by setting aside the entire ground floor of their new city hall for exhibitions and events that the general public would attend.

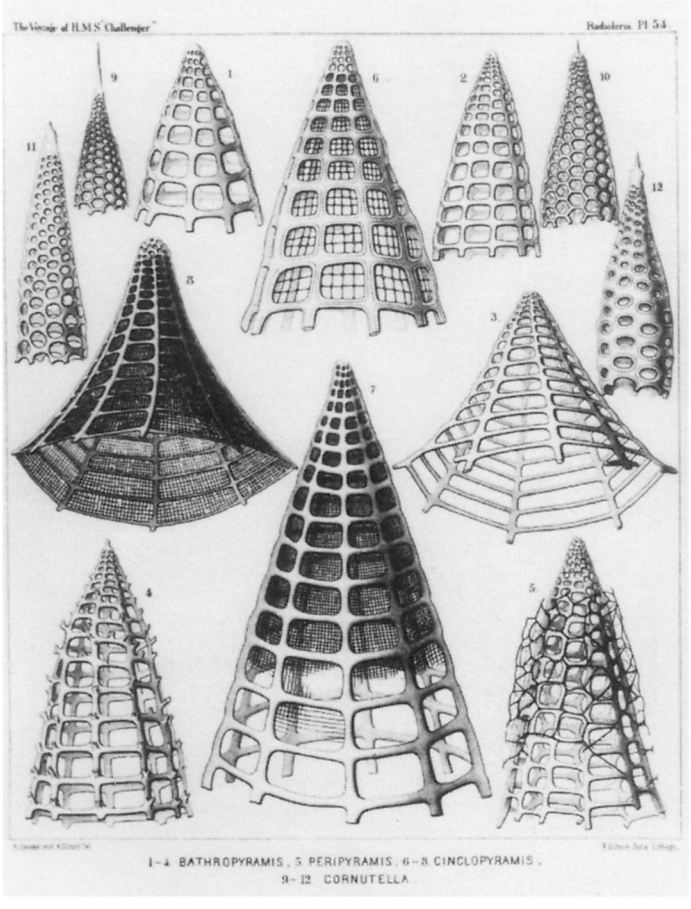
While City Tower remained in the imagination, Kahn turned in 1954 to work on the AFL-CIO medical center, and it was here that many of the themes thus far unrealized finally took built form.[67] The program called for a facility that would provide free health care to seventy thousand members of one of the largest labor unions in the country. Kahn explained that because his clients "were working people, I had to make this as close as possible to a palace."[68] Evoking precedents like the *maisons de peuple* built in Europe by a previous generation, he figuratively conferred upon working-class people — traditionally the disempowered — a status equivalent to that of the rich. To impart nobility was especially important, Kahn said further, for in the very act of joining, union members had "expressed their faith" in the power of collective action. Although the site was peripheral to Center City, Kahn considered its relation to the old city hall, faintly sketching in its mansarded tower in an early drawing that also reveals the guiding conception of the scheme. The AFL-CIO building, like City Tower, opened itself to the city, opaque facilities above juxtaposing a transparent double-height waiting area below. Though the building's bay system and proportions do evoke memories of Renaissance palaces, a more immediate source of inspiration may have been Beaudoin, Lods, and Prouvé's Maison du Peuple at Clichy, in which the architects similarly employed a transparent-ground-floor/opaque-upper-floor motif.[69]

As the scheme developed, Kahn designed an entry sequence in which users would enter on the long axis, thus increasing the grandeur of the procession inside. An earlier

scheme depicts granite panels on the ground floor as well; Kahn pulled these panels off the façade to create a small, semipublic area that would have made the transition inside even more complex and heraldic. In the final conception, Kahn constructed instead a glassy wall that he emphasized by pulling back the two corner columns within. The airy, light-filled area imparted a sense of dignity to the place where union members would wait; it also forced the sight lines outward and south toward views of Philadelphia beyond, as if to remind them that their small community was a microcosm of and participant in the larger community of the city itself.

Architects working in Kahn's office report that he considered the four-foot-deep Vierendeel truss he used for the Medical Services Building as equivalent to a space frame, but more usable because services could easily be threaded through apertures over two feet high.[70] The Vierendeel had been invented by a Belgian structural engineer around the turn of the century; thus, like the space frame, it was a long-span form particular to the twentieth century and could be constructed only in reinforced concrete or steel.[71] Rarely had the Vierendeel been used architecturally, almost never had it been exposed.[72] Thus in adopting it, Kahn returned to the search begun in the UNESCO center and City Tower for structurally adventurous, contemporary forms. The rounded-off rectangular apertures of the Vierendeels, moreover, were visually if not structurally similar to a type of radiolaria that Haeckel had illustrated, a photograph of which Kahn kept in his collection.

That Kahn perceived of the AFL-CIO medical center as part of his dual project of a "constant search for an [organic] order" and of encouraging communal identity is apparent in his management of the spaces within. The ground floor held only the lobby, a telegraph office, and a reception desk: to be seen by a doctor a patient had to as-



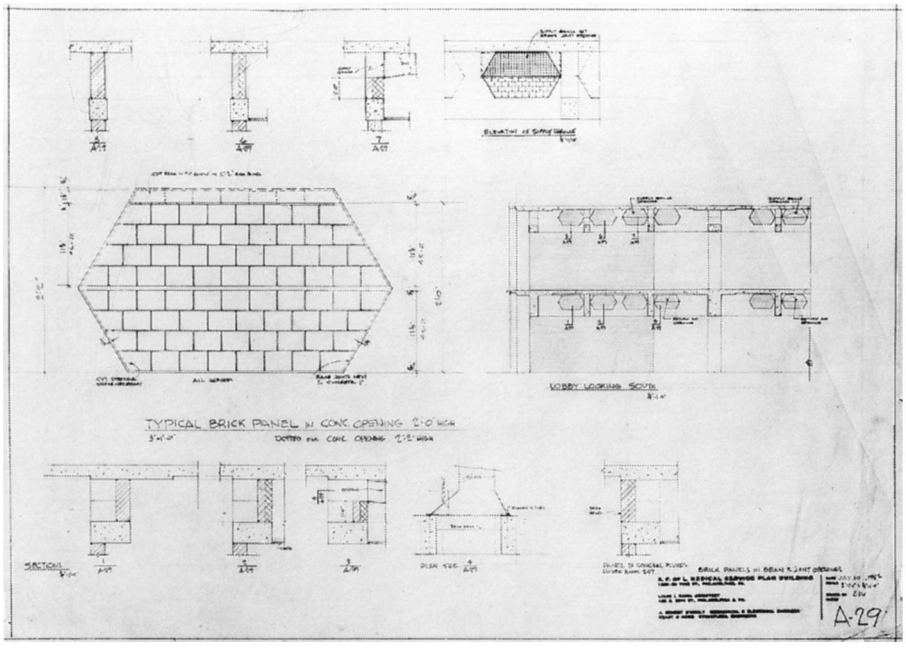
22. Photograph of radiolaria in Kahn's files, from Haeckel's *Report of the Scientific Results*

23. AFL-CIO building, view of interior balcony

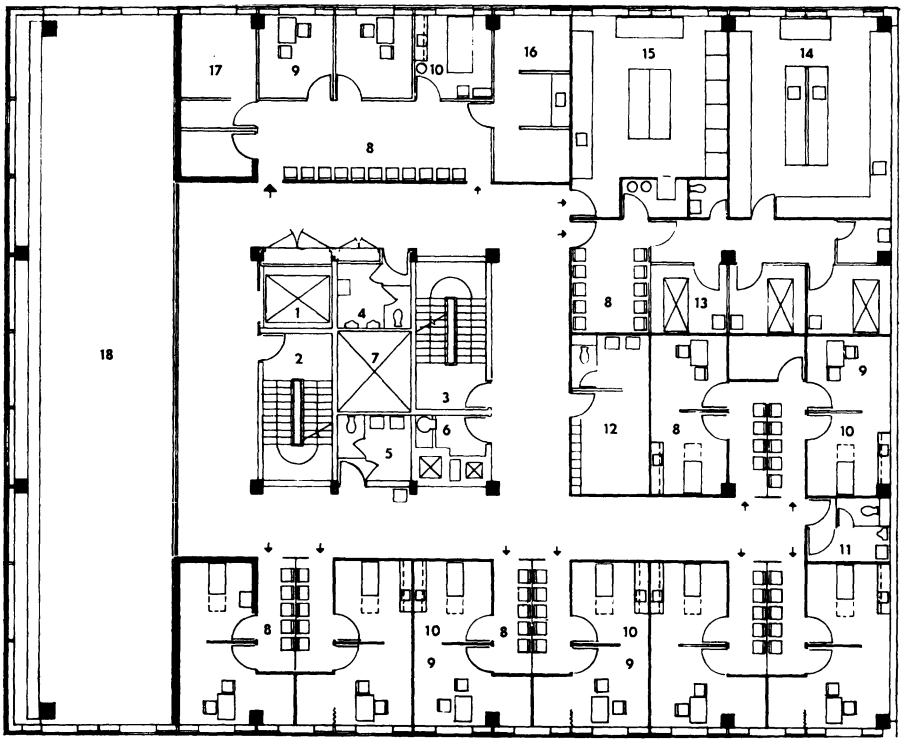
cend to the floor above. In the stairwell through which all had to pass, a Vierendeel reappeared, now embedded in brick: this manifested both the transition between floor levels and the organic interrelatedness of the whole. Once upstairs, the patient was again pressed out to look back onto his peers and the city before turning one hundred eighty degrees to proceed to the examination rooms behind.

Users of the building were constantly confronted by its dumb, insistent gridded skeleton, bones inside a transparent skin, framing indoor and outdoor spaces and all the rooms. Geometric order, furthermore, controlled the whole of the plan. Le Ricolais and Fuller believed that cubic forms belonged to nature's repertoire; briefly, Kahn had considered them for City Tower and they reappeared in the AFL-CIO plan. Essentially, it was a nine square, but with an additional slip to the south that took the building to the edge of the property line. The dimensions of the slip to the north equaled the dimensions of the partitions marking rooms within. The central square, the heart, was the service core that shot up out of the building in a design decision that Kahn later regretted and tried to change in two intermediary schemes. The square motif was carried into the smallest details, such as the shape of the columns supporting the Vierendeels. The same kind of ordered articulation of parts that characterizes a space frame ran through Kahn's handling of the AFL-CIO structure from large scale to small. The Vierendeel of the main façade, for example, was not joined to vertical members but instead slid by them, maintaining its discreet integrity. Similarly, for the banisters in the stairwells Kahn came up with two designs in each of which the tubular handrail was one straight piece of metal that slid by, rather than curved into, the rail for the level below.

The AFL-CIO medical center was more integrated in its vertical and horizontal planes than the design for the Art Gallery at Yale.[73] It was also more practical than the scheme Kahn and Tyng envisioned for City Tower. Here Kahn used a technologically progressive structure as a figurative analogue for a program that itself embodied the conviction that communal participation could lead to social change. As with City Tower, Kahn designed the building in a language potentially accessible to all users: tropes of organic form literally press themselves upon one attempting to describe its forms: skeleton, skin, veins, lungs, heart.



24. AFL-CIO building, drawing of stairwell detail showing Vierendeel with brick infill, 1956



25. AFL-CIO building, plan of second floor

In the early 1950s Louis Kahn continued to explore the critical activism that he had developed in the decades before. What changed was that he stopped trying to advance his social ideals by combining open urban spaces with representational art, seeking instead to symbolize his vision directly in architectonic form. In the next decade, his search to engender communal identity both continued and was transmuted. Kahn was a man constantly in the throes of self-critique; he was acutely sensitive to changes in the architectural discourse in which he participated and he was a close observer of cultural change. The techno-organic vocabulary he had adopted in City Tower became formally constraining in subsequent endeavors like the Trenton Jewish Community Center of 1955–59; perhaps Kahn also realized that it would be difficult for the uninitiated to apprehend the symbolic implications he believed were embedded in these forms.

More important, by the end of the 1950s the vocabulary that Kahn, Fuller, Tyng, and others had invented became socially irrelevant. By then the attitude of American architects toward technology had reversed itself: technology increasingly became associated with what was pejoratively termed "mass culture," and what Kahn and his peers had once perceived as a potential liberator now became an oppressor.[74] At the same time, Kahn's ideal of communal identity itself became less radical as he responded to the general conservatism of the 1950s, when many left-leaning social critics moved toward the center.[75] Kahn began to believe that the foundation of any community lay not in nature but in culture, in the personal bonds created by shared traditions. How these developing convictions helped shape projects such as the Unitarian Church in Rochester of 1959–62 and the National Assembly in Dhaka, designed from 1963 to approximately 1966, is a topic for a longer study: suffice it to say that even as Louis Kahn became the mystic who spoke of transcendence, joy, wonder, and light, he strove to create a built utopia of communal participation.

Notes

The themes discussed in this article are further developed my forthcoming book, *Utopia Is Real: Louis Kahn's Civic Projects 1944–1963*. Some of this research also appears in my doctoral dissertation, "Changing Symbols of Public Life: Louis Kahn's Civic and Religious Projects 1944–1966 and Architectural Culture at the End of the Modern Movement," Columbia University, 1995. I would like to express my gratitude to the following scholars who offered their thoughtful comments on previous iterations of these ideas: Mary McLeod, Robin Middleton, and Gwendolyn Wright of Columbia University; Danilo Udovicki-Selb and Richard Cleary of the University of Texas at Austin. Thanks also to Julia Moore Converse, curator of the Louis I. Kahn Collection at the University of Pennsylvania, who generously tolerated a last-minute research trip and numerous on-the-spot requests in my attempt to complete this essay. This article is dedicated to Anne Griswold Tyng of Philadelphia.

1. Since the 1936 publication of *Pioneers of the Modern Movement from William Morris to Walter Gropius* (London: Faber & Faber), in which Nikolaus Pevsner cited Morris as a "pioneer" of the modern movement particularly because of the social convictions he embraced, our understanding of the political ideologies of early modernists has become considerably muddied and more complex. Each voice in this debate will not be cited here; for one clear-headed assessment, see Richard Pommer, "Weissenhof and the Politics of the International Style," in *Weissenhof 1927 and the Modern Movement in Architecture* (Chicago: University of Chicago Press, 1991), 158–66. Pommer argues, correctly in my view, that however varied were the ideologies of the practitioners of the early modern movement, the conviction that architecture was a social practice that might advance the public weal remained a fairly consistent strain among members of the avant-garde.

2. The structure of the recent coauthored monograph on Kahn — in which one author writes on his modernist projects and one writes on his work in the 1950s — does not encourage an investigation of ideological connections between these two crucial periods in the architect's development. David Brownlee's excellent chapter on Kahn's work within the modern movement provides an essential overview; still, Brownlee says only that Kahn's activities before 1950 "do not . . . contradict what he did later; neither do they explain it." See David Brownlee and David DeLong, *Louis I. Kahn: In the Realm of Architecture* (New York: Rizzoli, 1992), 20 (hereafter cited as *In the Realm*; text by Brownlee or DeLong will be cited under the name of the individual author).

3. This definition is one of three presented by Clifford Geertz in "Ideology as a Cultural System," in *Ideology and Difference*, ed. David E. Apter (London: Collier, 1964), 52. Geertz identifies this as the "strain" theory, as opposed to what he calls, in reference to traditional Marxism, the "interest" theory of ideology. His third proposed definition incorporates elements of the first two.

4. Facts on the Jefferson National Expansion Memorial competition can be found in "Competition: Jefferson National Expansion Memorial," *Progressive Architecture* 27 (May 1948): 51–73, and George Howe, "Jefferson National Expan-

sion Memorial Competition," *Architectural Forum* 88 (March 1948): 14–18. See also Hélène Lipstadt, "In the Shadow of the Tribune Tower: American Architecture Competitions, 1922–1960," in *The Experimental Tradition: Essays on Competition in Architecture*, ed. Hélène Lipstadt (New York: Architectural League and Princeton University Press, 1989), 79–94. I am grateful to Ms. Lipstadt for sharing her research with me on this project, including her copy of George Howe's competition prospectus, *Architectural Competition for the Jefferson National Expansion Memorial, Program* (St. Louis, 1947).

5. Kahn probably knew of Le Corbusier's project from his then partner in practice Oscar Stonorov. Elizabeth Mock of the Museum of Modern Art in New York wrote Stonorov with praise for the scheme for St.-Dié on 22 October 1945. See "Correspondence October–December 1945," Box 50, Stonorov Papers, American Heritage Center, Laramie, Wyoming.

6. Quotations are from the text on Kahn's two competition boards, which remain in the collection of the Jefferson Memorial Historical Association, St. Louis, Missouri.

7. In the file entitled "The National Center for UNESCO" is an unpublished prospectus outlining UNESCO's aims, which Kahn used when he assigned a studio project on UNESCO to his students at Yale University in September 1948, the year after he had submitted his entry to the Jefferson National Expansion Memorial. See Box 61, Louis I. Kahn Collection, University of Pennsylvania and Pennsylvania Historical and Museum Commission (hereafter cited as Kahn Collection). Brownlee discusses the UNESCO studio in *In the Realm*, 54.

8. Issue five of *World Government News* (March 1947), published by the United World Federalists, is in "World Government," Box 63, Kahn Collection; on page 8, the text calls for a world republic with a headquarters based in Evanston, Illinois. Lewis Mumford, whose indirect influence on Kahn will be discussed later in this essay, was also interested in world government; see Lawrence J. Vale, "Designing Global Harmony: Lewis Mumford and the United Nations Headquarters," in *Lewis Mumford: Public Intellectual*, ed. Thomas P. and Agatha C. Hughes (New York: Oxford University Press, 1990), 266–76. In the *World Government News* brochure that Kahn kept, Mumford is listed as a member of the editorial board.

9. Correspondence between Kahn and various members of the Progressive Citizens of America party is in "Progressive Citizens of America PCA," Box 62, Kahn Collection. Background on Henry Wallace in general and the PCA in particular can be found in John Morton Blum, *V Was for Victory: Politics and Culture during World War II* (New York: Harcourt Brace Jovanovich, 1976), 279–92, idem, *The Price of Vision: The Diary of Henry A. Wallace, 1942–1946* (Boston: Houghton Mifflin, 1973), and Richard Pells, *The Liberal Mind in a Conservative Age*, 2d ed. (Middletown, Conn.: Wesleyan University Press, 1989), 69–71, 109.

10. Louis Kahn, "Monumentality," originally published in *New Architecture and City Planning*, ed. Paul Zucker (New York: Philosophical Library, 1944), 577–88; reprinted in *Architecture Culture 1943–1968: A Documentary Anthology*, ed. Joan Ockman with Edward Eigen (New York: Rizzoli, 1993), 48–54. All subsequent references to this essay will be to the reprint edition.

11. Kahn, "Monumentality," 51.

12. As reported to the author by Mrs. Esther Kahn, March 1990.

13. Information on Stonorov's biography comes from Frederick Gutheim, "The Social Architecture of Oskar Stonorov," in *L'architettura cronache e storia* 18 (June 1972): 77–107, and in the same special issue on Stonorov, Edmund Bacon, "Oscar Stonorov and the City," 116. On the impact of Stonorov's arrival on the Philadelphia architectural community, see Robert A. M. Stern, *George Howe: Toward a Modern American Architecture* (New Haven: Yale University Press, 1975), 195–96. On Kahn's collaborations with Stonorov, see Brownlee, *In The Realm*, 29–30.

14. On Lurçat, see *Architecture, Mouvement, Continuité* 40 (1976): 5–38, a special issue on the architect, and Jean-Louis Cohen, *André Lurçat 1894–1970: Autocritique d'un moderne* (Paris: IFA Mardaga, 1995).

15. Stonorov; quoted in Bacon, "Oscar Stonorov and the City," 116.

16. Stonorov and Kahn's Carver Court was published in *Architectural Forum* 81 (December 1944): 109–16, and was included in Elizabeth Mock, *Built in the U.S.A. 1932–1944* (New York: Museum of Modern Art, 1944), 66–67.

17. On Mumford's relationship with Catherine Bauer, see Rosalind Williams, "Lewis Mumford as a Historian of Technology in *Technics and Civilization*," in *Lewis Mumford: Public Intellectual*, 45–47; on Bauer, see Mary Susan Cole, "Catherine Bauer and the Public Housing Movement, 1926–1937," Ph.D. diss., George Washington University, 1975. On Stonorov's relationship to Mumford and Bauer, see Eric J. Sandeen, "The Design of Public Housing in the New Deal: Oscar Stonorov and the Carl Macklay Houses," *American Quarterly* 37 (Winter 1985): 645–67, and Brownlee, *In the Realm*, 29, who reports that Stonorov suggested Bauer as director of the United States Housing Authority and gave her office space in the offices of Stonorov and Kahn.

18. Catherine Bauer, "The Current Change in Civic Hopes and Attitudes," *Housing and Town and Country Planning Bulletin* 1 (November 1948): 35.

19. Lewis Mumford, "Patriotism and Its Consequences," *Dial* 66 (19 April 1919): 406; quoted in Casey Nelson Blake, *Beloved Community: The Cultural Criticism of Randolph Bourne, Van Wyck Brooks, Waldo Frank, and Lewis Mumford* (Chapel Hill: University of North Carolina Press, 1990), 188.

20. See Lewis Mumford, *Technics and Civilization* (New York: Harcourt Brace, 1934), 400–409. For a discussion of Mumford's attitude toward capitalism in the context of other American intellectuals in the 1930s, see Richard Pells, *Radical Visions and American Dreams: Culture and Social Thought in the Depression Years* (New York: Harper & Row, 1973), 96–150. In 1939, Mumford had written: "Our communities present a true picture of the economic institutions that produce them. They are chaotic because capitalism is chaotic; they are socially misplanned and economically disorganized because capitalism is misplanned and disorganized; they do not sustain human values because capitalism puts pecuniary values first" ("Social Imperatives," in *Public Housing in America*, ed. Morris B. Schnapper

[New York: Wilson, 1939]; quoted in Sandeen, "The Design of Public Housing," 664).

21. Mumford, Bauer, and Stonorov's collectivist ideals also influenced architectural commentators such as Kahn's former classmate from the University of Pennsylvania, Percival Goodman, who with his brother Paul published the widely read *Communitas: Means of Livelihood and Ways of Life* (Chicago: University of Chicago Press, 1947) the same year that Kahn submitted his entry to the National Park Service in St. Louis. Like Mumford, the Goodmans yearned for a society populated by citizens who strongly felt their duties as members of a public realm. Mumford's model was the New England village; the Goodmans and other architecturally minded theorists instead recalled the polis of ancient Greece. Urging their readers to "take a lesson from the Greeks, who spent most of their time in public places," the Goodmans envisioned the modern agora as the site for spontaneous communication among equals on topics of mutual concern; see ibid., 183. On Paul Goodman's political philosophy, see Lewis Fried, "The Kingdom of *The Empire City*: Paul Goodman's Regional Labor," in *Artist of the Actual: Essays on Paul Goodman*, ed. Peter Parisi (Methuchen, N.J.: Scarecrow Press, 1986), 57–79, and Kingsley Widmer, *Paul Goodman* (Boston: Twayne, 1980), 42.

22. See Michael Walzer, *Obligations* (Cambridge, Mass.: Harvard University Press, 1970), Michael Sandel, ed., *Liberalism and Its Critics* (New York: New York University Press, 1984), Charles Taylor, *Sources of the Self: The Making of the Modern Identity* (Cambridge, Mass.: Harvard University Press, 1989), and Jürgen Habermas, *The Social Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, trans. Thomas Burger with Frederick Lawrence (Cambridge, Mass.: The MIT Press, 1989). On the debate between the ideals of classical liberalism and those of communitarianism, see Paul Rosenberg, "Liberal Neutralism and the Social-Democratic Project," *Critical Review*, special issue on communitarianism (Spring 1994): 223–24. For a discussion of Mumford's thought as an antecedent to these more recent debates, see Casey Blake, "The Perils of Personality: Lewis Mumford and Politics After Liberalism," in *Lewis Mumford: Public Intellectual*, 283–300.

23. Walzer, *Obligations*, 91–92.

24. Sandel, introduction to *Liberalism and Its Critics*, 5–6.

25. Kahn proposed the City Tower project for a site by the Schuylkill River in "Toward a Plan for Midtown Philadelphia," *Perspecta* 2 (August 1953): 10–27. The draft for this article is in "Perspecta 4," Box 64, Kahn Collection. His attempt to get the project constructed as the new Municipal Services Building (a commission that eventually went to another Philadelphia architect, Vincent Kling) is mainly discussed in letters that Kahn wrote to Anne Tyng: these letters remain unpublished and are in Tyng's collection in Philadelphia; they will be cited below. I would like to express my deep gratitude to Anne Tyng for sharing these letters and for spending hours upon hours discussing the City Tower project. A design sequence for City Tower can be found in Louis Kahn, *Louis I. Kahn: Complete Work 1935–1974*, ed. Heinz Ronner and Shared Jhaveri, 2d ed. (Basel and Boston: Birkhäuser, 1987), 30–33. For critical commentary on and historical analysis of the project, see, most recently, Kenneth Frampton, *Studies in Tectonic Culture* (Cambridge, Mass.: The MIT Press, 1995); Ockman, ed., *Architecture Culture: 1943–1968*, 47, and Peter Shedd Reed, "Toward Form: Louis I. Kahn's Urban Designs for Philadelphia, 1939–1962," Ph.D. diss., University of Pennsylvania, 1989, 93–201. Peter Reed generously helped me find some material on City Tower that I could not have tracked down on my own, for which I am very grateful.

26. Literature on the AFL-CIO building is sparse and few documents remain in the Kahn Collection in Philadelphia. For a basic design sequence, see Kahn, *The Complete Work*, 78–81; aside from several contemporary articles that will be cited below, see DeLong, *In the Realm*, 34. Dan Hoffman of the Cranbrook Academy lectured on the Medical Services Building at a conference on Kahn at the Wexner Center for Visual Arts in 1993, inspiring me to look at the building more closely.

27. My description of City Tower is drawn from Kahn, "Toward a Plan for Midtown Philadelphia," from numerous interviews with Anne Tyng between 1990 and 1993, and from Anne Griswold Tyng, "Architecture is My Touchstone," *Radcliffe Quarterly* 70 (September 1984): 5–7.

28. See, for example, Vincent Scully's and David DeLong's treatment of the project in, respectively, *Louis I. Kahn* (New York: Braziller, 1962), 27, and *In the Realm*, 61. Kenneth Frampton's writings, cited above, are the exception to this trend.

29. Tyng has always claimed that the idea was originally hers, and the projects on which she was working prior to the start of City Tower, principally, her Bucks County School of 1951, substantiate her claims. The Bucks County School project was published in *Yearbook 1952* (Philadelphia: Philadelphia Chapter of the American Institute of Architects, 1952) and is discussed in Patricia Cummings Loud, *The Art Museums of Louis I. Kahn* (Durham, N.C.: Duke University Press, 1989). Moreover, the earliest drawings of the City Tower project, published as Kahn's in volume one of *The Louis I. Kahn Archive: Personal Drawings* (New York: Garland, 1987), are identifiably Tyng's, whose drawing style differs substantially from Kahn's.

30. Around December 1951 the Committee on Municipal Improvements of the local chapter of the American Institute of Architects was considering relocating Philadelphia's civic center, including the city hall, to a site by the Schuylkill River. Kahn was a member of the committee and he made a proposal for such a complex, which included a triangular-shaped city hall. See Reed, "Toward Form," 307, and the Minutes of the Committee on Municipal Improvements, 2 December 1951, in "AIA Municipal Improvements Committee," Box 63, Kahn Collection.

31. A memorandum to the Committee on Municipal Improvements, January 1952, reports that despite the committee's opposition, Edmund Bacon strongly supported a new civic center by the Schuylkill River "giving stimulus to a new area." See "AIA Municipal Improvements Committee," Box 63, Kahn Collection.

32. See John Maass, "Philadelphia City Hall: Monster or Masterpiece?" *Journal of the American Institute of Architects* 43 (February 1965): 23–

30, for a history of thoughts on razing all or part of Philadelphia's old city hall. In Box 31, Kahn Collection, is a report dated February 1947 by Clarke, Rapuano, and Holleran, consulting engineers and landscape architects to the Philadelphia City Planning Commission, which recommends demolishing the offices and retaining the tower, but adds that the building has "nothing to recommend it as a monument" (3). By 1951 the Philadelphia City Planning Commission had named Reyburn Plaza as the site for a new city hall; see *Penn Center Redevelopment Area Plan* (Philadelphia, 1952). Bacon was among those favoring demolition and argued that in addition to requiring costly maintenance, the building was "inefficient" and "uninspiring" and had a deleterious effect on those who worked there; see memorandum to the AIA Committee on Municipal Improvements, 10 January 1952, in "AIA Municipal Improvements Committee," Box 63, Kahn Collection. These discussions are covered very well in Reed, "Toward Form," 129–30, and in *Drawing Toward Building: Philadelphia Architectural Graphics 1782–1986* (Philadelphia: Pennsylvania Academy of Fine Arts and University of Pennsylvania Press, 1986), 132–34, 208–9.

33. Louis Kahn to Anne Tyng, 24 January 1954, Tyng Collection.

34. Kahn's letters to Edmund Bacon, Mayor Joseph Clark, Frances Lamner, and the managing director of the City of Philadelphia are in "City Hall & Office Building," Box 59, Kahn Collection. To Lamner, executive director of the Philadelphia Redevelopment Authority, Kahn wrote on 30 January 1954: "I wish to serve your Authority as the architect for this project, basing my fitness on the advanced study I have already given to the specific site problems and to the nature of interior space for such a building."

35. Louis Kahn to Edmund Bacon, 13 February 1954, in "City Hall & Office Building," Box 59, Kahn Collection. Kahn continued: "I would consider it a great privilege to work with you as architectural consultant."

36. Information about the Penn studio is contained only in Kahn's letters to Anne Tyng, Tyng Collection: 8 January 1954, 12 February 1954, 21 February 1954, 27 February 1954, and 7 March 1954.

37. Louis Kahn to Anne Tyng, 30 January 1954, Tyng Collection.

38. Kahn to Tyng, 7 March 1954, Tyng Collection.

39. Louis Kahn, "This Business of Architecture," *The Student Publication of the School of Architecture of Tulane University*; reprinted in *Louis I. Kahn: Writings, Lectures, Interviews*, ed. Alessandra Latour (New York: Rizzoli, 1993), 63.

40. See R. Buckminster Fuller, *The Artifacts of R. Buckminster Fuller: A Comprehensive Collection of His Designs and Drawings*, ed. James Ward (New York: Garland, 1985), 3: 20.

41. Fuller's visit to the North Carolina State College School of Design in the fall of 1953 is referenced in "Marines Test a Flying Bucky Fuller Barracks," *Architectural Forum* 100 (March 1954): 37; the same article mentions Fuller's visit to Princeton. The studio that he taught at Yale during the academic year 1951–52 was reported on in *Perspecta* 2 (1953): 28–35.

42. See various articles that either focus on Fuller or discuss his work in a larger context in *Architectural Forum* 95 (August 1951): 144–51; 96 (May 1952): 136; 97 (September 1952): 156–57, and (November 1952): 33; 98 (February 1953): 154–60, and (May 1953): 106–9; 100 (February 1954): 163, (March 1954): 35, and (April 1954): 154–57; and 101 (September 1954): 100–101, and (December 1954): 158.

43. See Robert Le Ricolais's letter to the editor in response to a previous article on Buckminster Fuller in *Architectural Forum* 111 (September 1959): 98. Critiquing Fuller's geodesic domes, Le Ricolais argued that "the geometry of the sphere is alas not concerned with a logical dome design."

44. "Bucky Fuller Starts 'The Only Architectural Revolution,'" *Architectural Forum* 95 (August 1951): 144; Robert Le Ricolais, unpublished draft of a response to a paper by Felix Samuely for *Architectural Forum*, dated December 1952, Le Ricolais Archive UE VII, 149, Architectural Archives, University of Pennsylvania, Philadelphia.

45. Felix Samuely, "Is This Tomorrow's Structure? Space Frame Enthusiasts Marshal Many Reasons for Predicting It Is," *Architectural Forum* 98 (February 1953): 152. Samuely had designed the Pavilion of Transport for the Festival of Britain in 1951, which was a space frame; see "Space Frames and Stressed Skin Construction," *Royal Institute of British Architects Journal* 59 (March 1952): 166–73.

46. A history of space frames can be found in the entry under that heading in the *Encyclopedia of Architecture: Design, Engineering, and Construction*, ed. Joseph A. Wilkes (New York: John Wiley and Sons, 1989), 4: 510–18, and in Z. S. Makowski, "Space Structures: A Short Review of Their Development," in *Space Structures*, ed. R. M. Davies (New York: John Wiley and Sons, 1964), 1–8.

47. See, for example, "Marines Test a Flying Bucky Fuller Barracks," 37.

48. Douglas Haskell, "The Crystal Ball," *Architectural Forum* 94 (June 1951): 198–200; R. Buckminster Fuller, "No More Second-Hand God," *North Carolina State College, Student Publications of the School of Design* 4 (Fall 1953): 22.

49. See Frampton, *Studies in Tectonic Culture*, 216–17.

50. D'Arcy Thompson, *On Growth and Form*, 2d ed. (Cambridge: Cambridge University Press, 1942). The catalogue for the Thompson exhibition is *Aspects of Form: A Symposium on Form in Nature and Art*, ed. Lancelot Law Whyte (London: Percy Lund Humpheries, 1951).

51. Ernst Heinrich Haeckel, "Report on Radiolaria," vol. 18 of *Report of the Scientific Results of the Voyage of the H.M.S. Challenger During the Years 1873–1878* (London: Her Majesty's Stationery Office, 1887). Le Ricolais reproduced many drawings from Haeckel's study in a special issue on the biologist's work in the *North Carolina State College, Student Publication of the School of Design* 3 (Spring 1953). Tyng mentions the impact of Haeckel's work on her thought in her Ph.D. diss., "Speed Spiral," University of Pennsylvania, 1975, 161–75.

52. The exhibition was entitled *The New Landscape in Art and Science*; Kepes expanded the themes of the exhibition into a book of the same name (New York: Paul Theobald, 1956). Tyng reported that she and Kahn knew Kepes's work in these years in an interview with the author, March 1992.

53. Fuller mentions the impact on his ideas of studies under the elec-

tron microscope in "No More Second-Hand God"; Tyng mentions the electron microscope in "Anatomy of Form/Atom to Urban," unpublished ms., 1962. The first electron microscope was built in the early 1930s in Germany, where two competing teams of scientists were working on it at the same time. In 1938 Siemens became the first company to manufacture electron microscopes commercially. For a history of the development of the electron microscope, see L. Marton, *Early History of the Electron Microscope* (San Francisco: San Francisco Press, 1968); see also articles on the history of the electron microscope in the *Encyclopedia Britannica*, 14th ed., 15: 396–402, and *The New Encyclopedia Britannica*, 15th ed., 66–69.

54. Robert Le Ricolais, "Contribution to Space Structures," *North Carolina State College, Student Publication of the School of Design* 3 (Spring 1953): 1; Fuller, "No More Second-Hand God," 23.

55. Fuller first used the term "one-town community" in reference to the world in conjunction with his Dymaxion World Map; he later expanded it to refer to the potential of technology in general, which "has shrunken the world to a one-town community" (cited in Robert Marks, *The Dymaxion World of Buckminster Fuller* [New York: Reinhold, 1960], 39, 61). See also Tyng, "Anatomy of Form."

56. Lancelot Law Whyte, *The Next Development in Man* (New York: Henry Holt, 1948), vii. Tyng reported the impact of Whyte's work on her own in an interview with the author, January 1992.

57. Louis Kahn to Anne Tyng, 15 April 1954, Tyng Collection; reprinted in Alexandra Tyng, *Beginnings: Louis I. Kahn's Philosophy of Architecture* (New York: Wiley, 1984).

58. In his letter to Tyng of 15 April 1954, Kahn described presenting his ideas to Samuely when he came to Yale to lecture. Tyng, interview with author, March 1992, reported that Kahn was instrumental in getting Samuely invited to Yale and hosted him upon his arrival; according to the chronology database at the Kahn Collection, Samuely visited Kahn's office on 24 April 1954. Correspondence between Le Ricolais and Kahn is in "Le Ricolais, R. — Paris, France," Box 62, and "North Carolina State College — LIK," Box 56, Kahn Collection. For more details on Kahn's relationships with Le Ricolais and Samuely as well as on the importance of North Carolina State in avant-garde thought in the early 1950s, see Williams Ksiazek, "Changing Symbols."

59. See Dan Kiley to Louis Kahn, 3 May 1948, in "American Institute of Architects 1947," Box 60, and the letter from "Bry Ted Diana" to Kahn and Tyng, 24 September 1953, in "Louis I. Kahn (personal) — 1953," Box 60, Kahn Collection. Whyte's books remain in Kahn's personal library, which at the time of my research was in Philadelphia in the possession of his widow, Mrs. Esther Kahn; it has since passed to his daughter Sue Ann Kahn of New York City.

60. See Scully, *Louis I. Kahn*, who compares the tetrahedrons of the Yale Art Gallery ceiling to the four-sided pyramids that Kahn saw on his trip to Egypt in 1951; see also DeLong, *In the Realm*, 55, and Kenneth Frampton, "Louis Kahn and the French Connection," *Oppositions* 22 (Fall 1980): 21–53, who argues for a continuous "French connection" in Kahn's work and reiterates Marcello Angrisani's claim that the final plan for the Adath Jeshurun synagogue was lifted from Claude-Nicolas Ledoux's plan for an Inn in Fauboug St.-Marceau.

61. Kahn, "Toward a Plan for Midtown Philadelphia."

62. Louis Kahn to Anne Tyng, 18 December 1953, Tyng Collection (Kahn's emphasis).

63. Kahn wrote to Howard Spitznagel, an old classmate and an architect in Sioux Falls, South Dakota, that "I have been struggling with the differentiation between 'order' and 'design'"; see Kahn to Spitznagel, 16 December 1953, in "Louis I. Kahn (personal) — 1953," Box 60, Kahn Collection. At a conference at Princeton University on 11 December 1953, Kahn spoke of order as consistent and design as circumstantial; see the transcript "Architecture and the University," 54–55, in "Princeton University — correspondence, December 1953–February 1958," Box 55, Kahn Collection. Kahn's concept of order is close to both that of Kepes's in *The New Landscape*, 19, and Whyte's in *The Next Development*, viii. My argument — that Kahn's concept of order is based on geometric structure found in nature — differs from many other interpretations of this notion, which often see it as a Platonic archetype that also encompasses historical references. Cf. Reed, "Toward Form," 94, and Francesco Tentori, "Order and Form in the Work of Louis Kahn," in *Louis I. Kahn: L'uomo, il maestro*, ed. Alessandra Latour (Rome: Edizioni Kappa, 1986), 187–203. Closest to the argument I present here is, perhaps not surprisingly, that of Anne Tyng's daughter, Alexandra Tyng, *Beginnings*, 162, in which she argues that by order Kahn meant "the harmony of all laws of nature working together."

64. See Rudolph Wittkower, "The Problem of Harmonic Proportion in Architecture," in *Architectural Principles in the Age of Humanism* (New York: Norton, 1971), 101–54.

65. Kahn, "Toward a Plan for Midtown Philadelphia."

66. The phrase "non-directional space" appears on one drawing Kahn sent to Tyng that remains in Tyng's collection; it also appears on a drawing in the Kahn Collection.

67. Information on the AFL-CIO Medical Services Building can be found in Kahn, *The Complete Work*, 78–81; "Dedication," *The Philadelphia Inquirer*, 17 February 1957, A14; "Demolition," *The Philadelphia Inquirer*, 27 August 1973, B3; Victoria Donohue, "Downtown Philadelphia Loses its only Kahn Building," *Progressive Architecture* 54 (November 1973): 23, 26, and "Kahn Finds Lessons in Ruins of His Work," *The Philadelphia Inquirer*, 27 August 1973, B3.

68. "Kahn Finds Lessons."

69. See Bruno Reichlin, "Maison du Peuple at Clichy: A Masterpiece of 'Synthetic' Functionalism?" *Daidalos* 18 (15 December 1985): 90–99.

70. Tim Vreeland, interview with the author, February 1994.

71. Professor A. Vierendeel presented the truss in comprehensive form in "Theorie générale des poutres Vierendeel," in *Mémoires de la Société des Ingenieurs Civils de France* (Paris, 1900; see L. C. Maugh, *The Analysis of Vierendeel*

Trusses by Successive Approximations (Zurich, 1935).

72. A notable exception was Luigi Figini and Mario Ridolfi's Chiesa della Madonna dei Poveri in Milan, 1952–54, published in *Casabella* 208 (1955).

73. Kahn wrote of how dissatisfied he was with the integration of vertical and horizontal planes in "Order in Architecture," *Perspecta* 4 (1957): 67.

74. For more on changing attitudes toward technology among American architects in the 1950s, see Williams Ksiazek, *Utopia Is Real*.

75. The classic work outlining the transition of liberal thought to the center in the 1950s is Pells, *The Liberal Mind in a Conservative Age*, esp. chaps. 4 and 5.

Figure Credits

1. Photograph and model by William Christensen.

2, 15. Gyorgy Kepes, *The New Landscape in Art and Science* (New York: Paul Theobald, 1954).

3, 5. Jefferson Memorial Historical Association, St. Louis, Missouri.

4. *The Louis I. Kahn Archive: Personal Drawings* (New York: Garland Press, 1987).

6, 11–14, 18, 18–24. Courtesy of the Louis I. Kahn Collection, University of Pennsylvania and Pennsylvania Historical and Museum Commission.

7. Paul Zucker, ed., *New Architecture and City Planning* (New York: Philosophical Library, 1944).

8. *Architectural Forum* 81 (December 1944).

9. *Perspecta* 2 (August 1953).

10, 23. E. Teitelman Photography.

17. Alexandra Tyng, *Beginnings: Louis I. Kahn's Philosophy of Architecture* (New York: Wiley, 1984).

25. *Louis I. Kahn: Complete Work 1935–1974*, 2d. ed (Basel and Boston: Birkhäuser, 1987).