

134. Trylon and Perisphere behind General Motors building, New York World's Fair of 1939. Geddes Collection.



A Microcosm of the Machine-Age World

... the danger of being fantastic in a Wellsian sense, and of being too definitely prophetic, must be avoided.

—Walter Dorwin Teague

It will cease to look like a collection of things for sale and reveal its real nature as a gathering of live objects, each of which is going to do something to [us], possibly something quite startling, before [we are] very much older.

—H. G. Wells

War in Europe seemed certain when the New York World's Fair opened in the spring of 1939, dedicated to "building the world of tomorrow." Exhibitors and fair-goers alike sought momentary escape in considering, as they had planned, the world of the future. The Century of Progress Exposition had marked the culmination of the modernistic style of New York architects; now the fair of 1939 embodied in its streamlined buildings and exhibits the methods and visions of industrial designers. Teague, who served with six architects on the Board of Design, turned the fair's commercial promoters from an original intention to celebrate the 150th anniversary of Washington's inauguration as president at New York to a goal of envisioning the future society, which he had been projecting through the decade.¹ He and other designers provided "focal exhibits" within major buildings devoted to such subjects as transportation, communication, and science; conceived exhibits for private firms within those buildings; and designed complete buildings, inside and out, for major industrial concerns. Virtually all observers agreed that the fair's greatest hit was the Futurama, designed by Geddes for General Motors, a huge diorama depicting projected superhighways and cities of 1960. It was the industrial designers' fair.

The fair would not have become a reality without help from the one man in America who planned and built on the total scale that industrial designers aspired to but attained only in transitory dioramas. For fifteen years, as head of the Long Island State Park Commission, the New York City Park Department, and the financially and politically independent Triborough Bridge Authority, Robert Moses had put his stamp on the nation's largest city by projecting, planning, and building parks, parkways, bridges, and expressways. For more than a decade he had dreamed of creating a park larger than Central Park, in northern Queens just south of Flushing Bay, an area of swampland whose only elevation was an "expanse of stinking

refuse known as the Corona Dump."² The project became essential to Moses after construction of his Grand Central Parkway, which skirted the area's western edge, in order that motorists need no longer drive through mountains of garbage. When he learned of plans for the fair, he refused to let promoters use any city parks but offered to put his considerable influence behind reclamation of Flushing Meadows as a fair site, provided that it be planned as a permanent city park.

Armed with \$59 million in state and federal funds obtained by Moses, the city purchased the site and the fair corporation set to work reclaiming it. Working twenty-four hours a day for nine months beginning in July 1936, teams of laborers filled in the swamp with six million cubic yards of ash and garbage and shaped two lakes, from which a million cubic yards of sludge were taken to become topsoil after chemical treatment. Two new sewage-treatment plants rid Flushing Bay of pollution, while a tide gate and dam controlled drainage. Still, most exhibit buildings rested on piles driven deep into subsurface sand. Installation of underground utilities and landscaping, including the importation of ten thousand trees, completed the site preparation. Although the fair itself seemed, as the *Official Guide Book* claimed, "a vast city which progressed from blue prints to reality in an amazingly short time," the real "miracle" was "the largest single reclamation project ever undertaken in the eastern United States."³ Visions of the future projected in the fair's exhibits by industrial designers collectively made only a footnote to the more solid career of urban planner and builder Robert Moses.

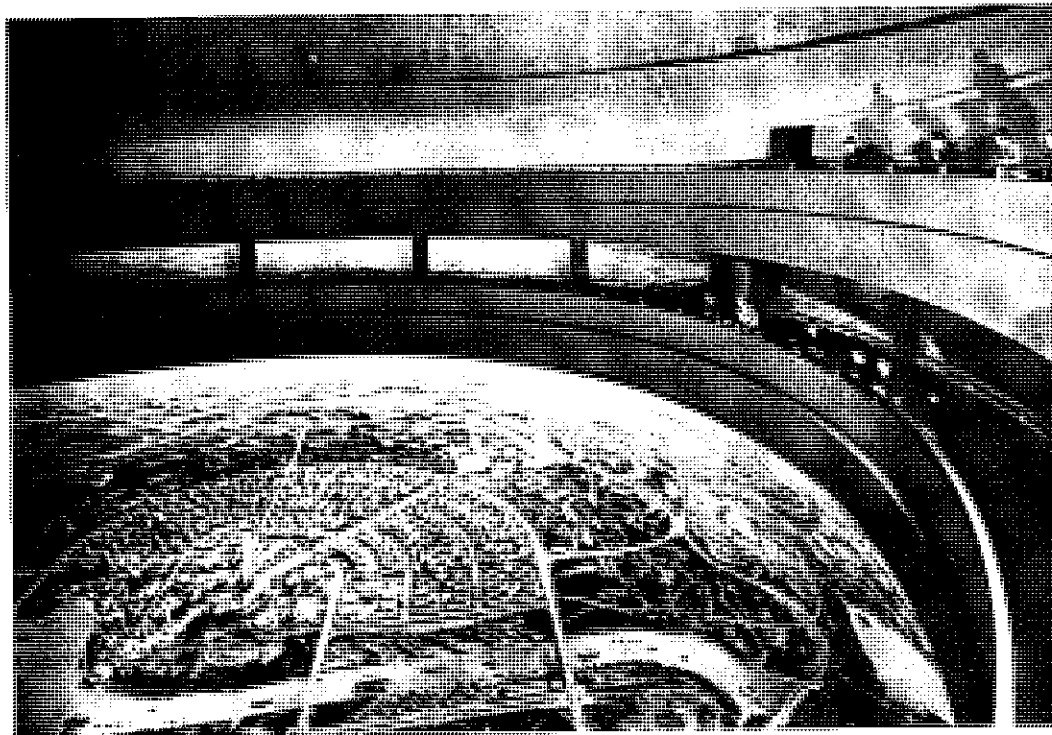
This subtlety was lost on thousands of people who converged daily on the fair by subway, train, bus, taxi, and private auto. Wherever they entered, they looked first for the spare, precise, stark white forms of the "theme center" (figures 134 and 135) looming above the fair's low architecture. The Trylon, a three-sided needle extending seven

hundred feet into the air to a sharp point, symbolized, according to the *Official Guide*, "the Fair's lofty purpose."⁴ Next to it, floating on barely visible piles over a circular pool, was the Perisphere, a smooth globe two hundred feet in diameter. A short arched bridge joined it to the Trylon at about sixty feet above the ground. From that point the Helicline, a wide flat ramp supported by slender round columns, spiraled down around both forms in almost a full circle to the ground. Up close, the stuccoed surfaces of the Trylon and Perisphere looked lumpy, as if someone had pasted burlap to wooden forms, but that unfortunate effect vanished at a slight distance. Abstracted, rendered in silhouette, the widely reproduced sphere and triangular needle became evocative images. Designed by architects Wallace K. Harrison and J. André Fouilhoux, they embodied the contradictory associations of the more ordinary streamlined architecture around them—the Trylon representing limitless flight into the future, the Perisphere controlled stasis.

The static vision gained expression inside the limiting curve of the Perisphere itself, where the fair's theme exhibit, designed by Dreyfuss, was mounted. After riding an escalator from the base of the Trylon into the Perisphere, visitors stepped onto one of two platforms, one above the other, revolving in opposite directions around the interior circumference of the globe. Apparently floating in space, they saw above them images of cloud and sky cast on the dome by concealed projectors and below them Democracy (figure 136), a meticulous model of "a perfectly integrated, futuristic metropolis" stretching fifteen scale miles to the horizon.⁵ Although Dreyfuss referred to urban studies in devising this model, he intended Democracy not as "the perfect city plan" but as "a symbol of all city planning."⁶ In his decentralized scheme, adapted from Ebenezer Howard's Garden City concept, a central city about two miles in diameter contained business, cultural, and leisure activities in low



135. Trylon and Perisphere. Architectural Forum.



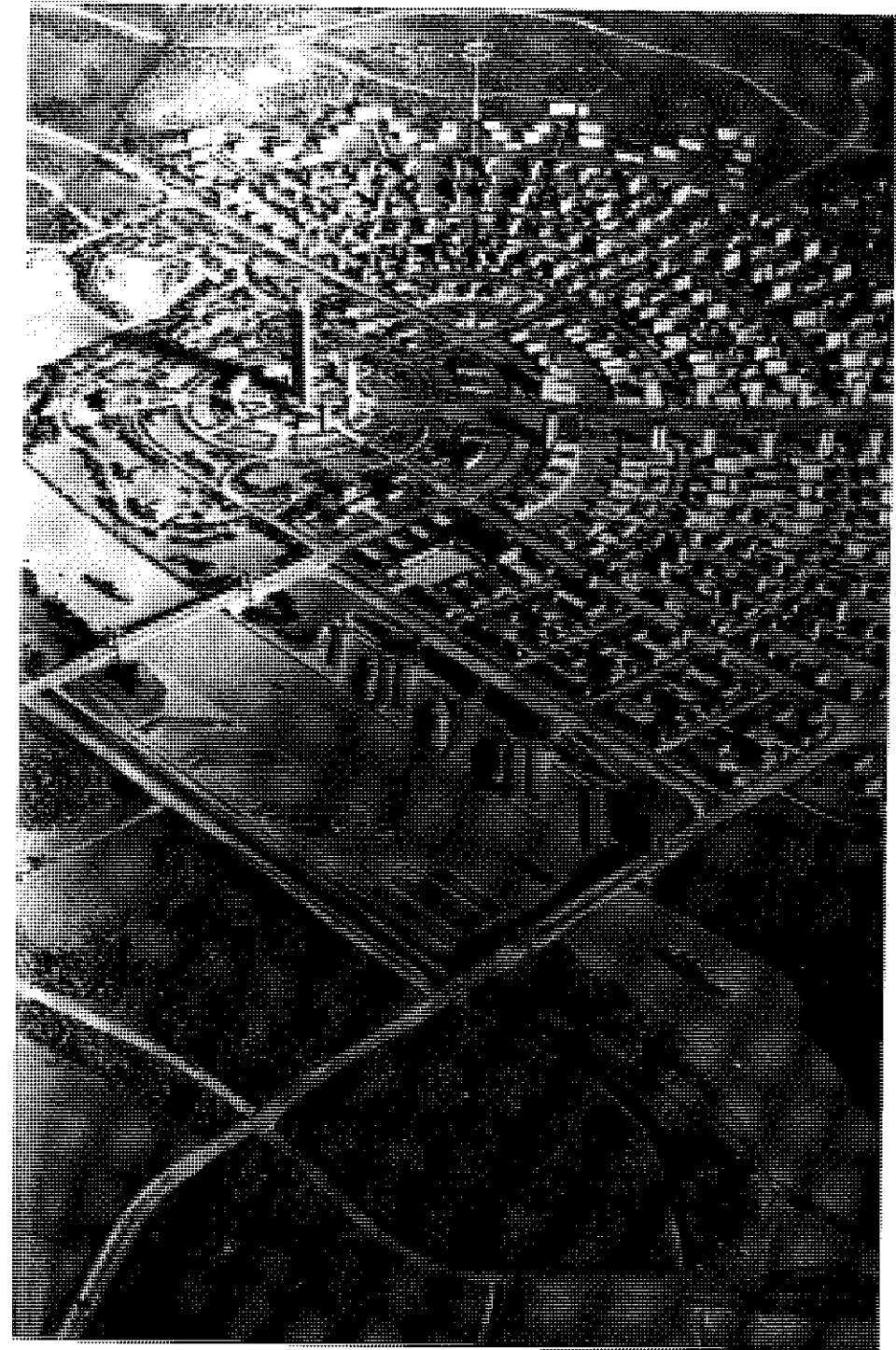
136. Dreyfuss. *Democracy model inside the Perisphere*. Architectural Forum.

buildings separated by generous green spaces and connected by pedestrian walkways over streets and highways (figure 137). Zoned according to use, this central area ended abruptly on a river and a semicircular beltway. Beyond stretched a greenbelt of parks and farmland, dotted with twenty-five satellite towns, some purely residential and others residential-industrial, each with its school and small business district but dependent on the center for all but necessities.

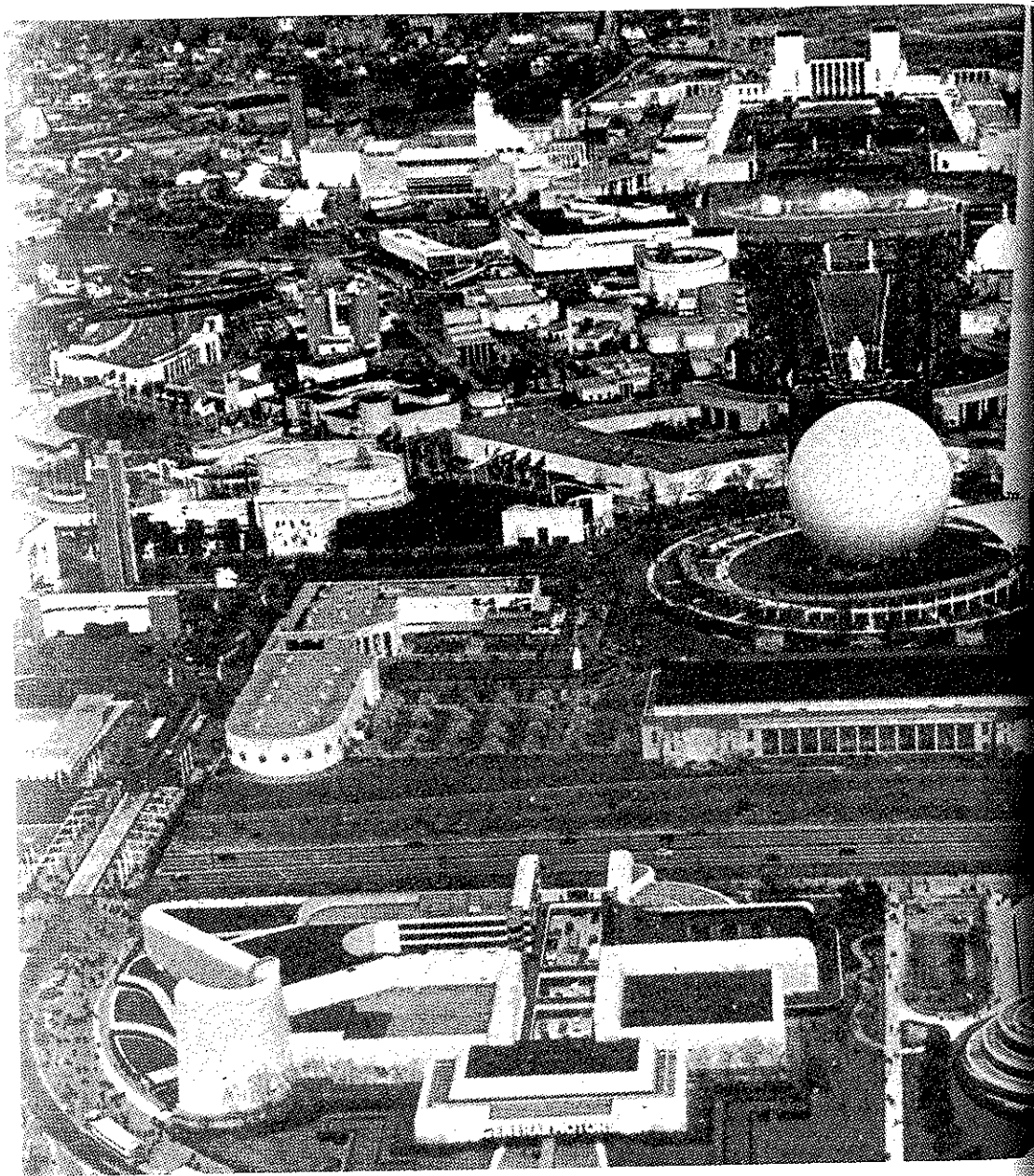
In this scheme, according to Dreyfuss, leisure time would "not be dissipated in idleness or carousing, but . . . employed in improving man, physically and mentally . . . through organized athletics, lectures, concerts and the direction of his pursuit of his own hobbies."⁷ A hint of the Ethical Culture vision is here, but *Democracy* also incorporated ideas common throughout the fair. The concept of rigid control, embodied in the fair's thematic zones, reflected paternal-

istic faith in total environmental planning to provide the good life for all. Fully planned in every detail, *Democracy* offered a vision of social stasis. Within its regulated zones, as within the *Perisphere's* enclosing globe, there was no room for growth. And it was not, according to a variant of frequently made observations, the "impossible dream of a Jules Verne or an H. G. Wells," but a city that "could be constructed tomorrow with the technological knowledge we [now] have."⁸ In this sense *Democracy* reflected most exhibits at the fair, which was described by a critic as in general "looking at Tomorrow and arriving mostly in the middle of Today." By displaying contemporary technologies and industrial processes in futuristic architectural settings, commercial exhibitors implicitly stated that the future was already here if people would only realize it.⁹

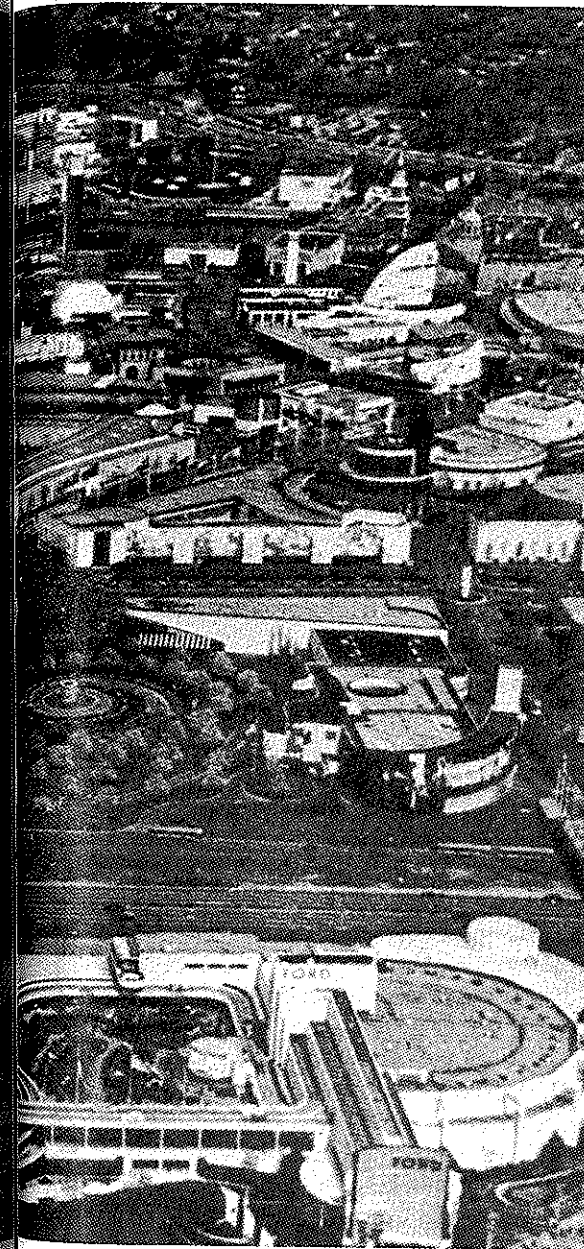
The techniques used by Dreyfuss to present *Democracy* to fair-goers echoed those



137. Dreyfuss. *Democracy*. Dreyfuss Collection.

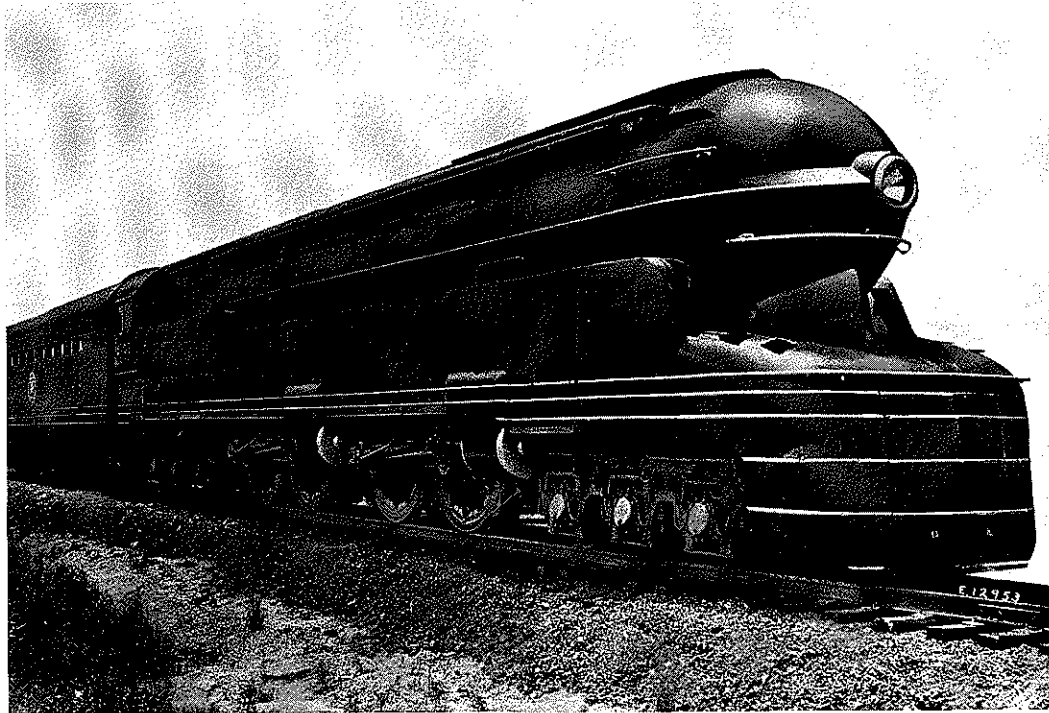


138. Overview of New York World's Fair of 1939 with Transportation Zone in foreground. Architectural Record.



employed throughout the fair. Rapid movement of large crowds required devices like escalators and revolving platforms. But these tended to make people passive consumers of simplistic images displayed quickly and dramatically. Intricate subtleties of Dreyfuss's plan were lost on most viewers, who became entranced by an accompanying orchestral and choral composition, a vague narration "stressing a lot of cosmic points about humanity,"¹⁰ and a grand finale to the six-minute show in which projected images of groups of workers representing various trades marched forward from a distance, finally forming a gigantic ring of interdependent humanity around the interior dome of the Perisphere. Harmless enough in the theme center, streamlined circulation techniques and futuristic display mechanisms gave manufacturers the means for impressing their own vision of the future on the minds of consumers. These methods implied the possibility of an imperceptibly controlled future society far different from Dreyfuss's pastoral Democracy.¹¹

One observer reported that the theme center's "dramatic punch" is felt "when you step off the moving platform and find yourself suddenly outdoors, on the Helicline, suspended high above the fountains playing on the Perisphere, with the living diorama of the Fair itself below you—with all its cock-eyed lights, colors and angles—and the ramp, black with slow moving figures, sweeping around the great ball to terra firma—a stage set for some fantastic, futuristic dream."¹² Looking out from the ramp's first downward sweep, a visitor saw the Transportation Zone (figure 138), appropriately separated from the rest of the fair by the Grand Central Parkway. Map in hand, one could pick out the Aviation and Marine Transportation buildings' vaguely representational forms, Teague's gear-shaped Ford building with a spiraling outdoor auto test ramp, and Geddes's flowing, free-form General Motors building. Beyond, separated by a semicircular tree-lined promenade, lay



139. Loewy. S-1 locomotive for Pennsylvania Railroad, 1939. Raymond Loewy.

the conventionally streamlined forms of Loewy's Chrysler building, its ovoid center section flanked by slender pylons with streamlined chevrons, and the Eastern Railroads building. There one could later view the world's largest steam locomotive, Loewy's bullet-nosed Pennsylvania S-1 (figure 139), driving furiously nowhere on a treadmill.¹³

Winding clockwise down the Helicline, one touched ground on the Perisphere's opposite side, from which the fair's main axis extended northeast as a wide, tree-lined mall, broken by rectangular reflecting pools, a mammoth statue of Washington, a circular fountain-filled Lagoon of Nations—terminating in a hopefully named Court of Peace, with the Federal building at its head, looking like an import from Mussolini's Italy. Two diagonal avenues radiating north and east from the Perisphere contributed to this formal layout, which architectural critic Talbot

F. Hamlin found incongruent to the "rococo" (that is, streamlined) forms of the fair's buildings.¹⁴ Stretching from the Perisphere to the lagoon were exhibits of business and industry, divided into zones of Communications, Community Interests, Food, and Production and Distribution. Beyond lay exhibits of individual states and foreign nations.

To the southeast, separated from the fair's more serious aspects by Horace Harding Boulevard, was the Amusement Zone. There one could stroll along Fountain Lake, relax in half-timbered Merrie England, watch swimmers' patriotic precision drills in Billy Rose's Aquacade, or enjoy a nightly sound-light-fountains-fireworks extravaganza over the lake. Or, for a mere fifteen cents, one could enter Geddes's Crystal Lassies concession, a "polyscopic paradise for peeping Toms" with "enough angles to confuse an Einstein." Looking through one-way mirrored glass, viewers on three levels watched a single top-

less dancer on a twelve-foot-square glass platform, her image multiplied hundreds of times by the octagonal structure's multifaceted mirrors.¹⁵

As a whole, the fair lacked the illusion of precision provided by Geddes's show. Its halfhearted formal layout failed to pull together a riotous confusion of architectural forms whose only common denominators were streamlines, pylons, bright reds and yellows, and shiny metal trim. Unlike Democracy, the unified conception of a single intelligence, the fair as a whole was the product of hundreds of competing firms, each seeking to attract attention. As Loewy frankly admitted, in an apt metaphor for consumer-oriented machine-age America, it was "a huge department store."¹⁶

According to Teague, the fair provided manufacturers "an opportunity to state the case for the democratic system of individual enterprise" at a time when other nations were adopting collectivism. By collaborating with industry on this project, industrial design was thus "emerging for the first time in its major, basic role—as the interpreter of industry to the public."¹⁷ As Teague seemed to admit, however, participation in the fair subjected designers to the art-and-industry dilemma that had plagued them throughout the decade: did promotion of sales naturally lead to beauty? Teague thought so. He stated in 1937 that although the world's fair would function primarily as "a place where merchants come to display their wares to possible purchasers," it would also be "aesthetically beautiful—a vast, magnificent work of art."¹⁸

Much of the fair's own publicity, which sounded as if Teague had written it, revealed a split between the ideal and the real. An expensive promotional volume issued in 1936 contained a visionary foreword by fair president Grover Whalen. With an implied nod to H. G. Wells, Whalen suggested that the fair would predict and possibly dictate the "shape of things to come" by exhibiting "the most promising developments of ideas,

products, services and social factors of the present day in such a fashion that the visitor may, in the midst of a rich and colorful festival, gain a vision of what he might attain for himself and for his community by intelligent, cooperative planning toward the better life of the future."¹⁹ Whalen more clearly spelled out his commercial meaning the following year in a public relations pamphlet. Not nearly as visionary as before, Whalen declared that "business and industry possess today most of the implements and materials necessary to fabricate a new World of Tomorrow." Society did not need "new inventions and new products" but "new and improved ways of utilizing existing inventions and existing products." The fair, according to Whalen, would help "sell a new method or procedure or way of life involving the use of many new [*sic*] products" by bringing "large groups of producers and distributors . . . into direct, planned and simultaneous contact with great masses of consumers." The fair thus would provide business and industry with "an opportunity to construct their own World of Tomorrow, to build for the future along lines patterned and planned." In other words, the fair would embody "the specifications" for a consumer society planned not cooperatively by its citizens but by producers and distributors who hoped to promote sales of individual products to individual citizens.²⁰

Visitors to the fair found the popular image of planning embodied in Democracy, in Teague's diorama for U.S. Steel, showing a Corbusian city whose towers were separated not by parks but by a labyrinth of multilevel highways, and even in Loewy's Wellsian "rocketport of the future," an animated diorama (figure 140) depicting a rocket gun capable of shooting a projectile full of passengers from New York to London in one hour. But the fair's true vision of the future was presented in the Town of Tomorrow, a group of predominantly traditional homes furnished with a wide variety of conveniences and appliances. Consumer en-



1939. Loewy (right) supervising construction of the rocketport of the future for the transportation focal exhibit. Raymond Loewy.

gineering constituted the fair's major element of social planning.

The arrangement of fair buildings was chaotic, but individual structures were carefully planned to instill specific images in the minds of visitors. With typical perceptiveness Douglas Haskell observed that the fair witnessed the emergence of "architecture as environmental control" rather than "the mere enclosing of space." Nineteenth-century exhibition buildings were vast sheds meant only to shelter typical objects, machines, and cultural artifacts of civilization. By 1939, however, attention had shifted from objects to their potential consumers. By "taking care of the visitor's every requirement, actual or fancied, not to mention

his guidance," exhibition buildings had become machines for processing people.²¹ Unlike former expositions, which often brought people up sharp in amazement, making them stop to ponder the mute significance of the Corliss engine or Edison's light bulb, the streamlined 1939 fair eliminated thought-provoking disturbances in order to present superficial images. Teague, who so often articulated what designers were doing, insisted that "people must flow in an exhibit." They had to "follow the line of least resistance just as water does."²² Exhibits had to be engineered "in such a way that the spectator's interest is stimulated and his responses are involuntary."²³

Fatigue was the major obstacle to making

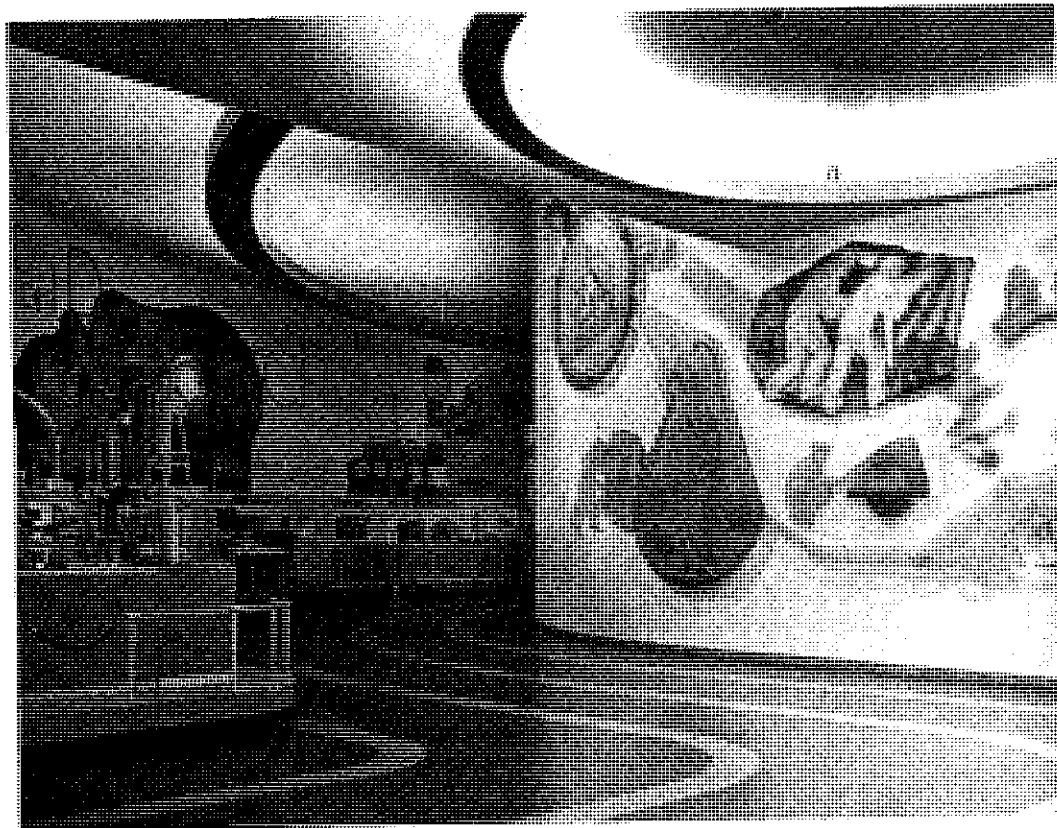
an impression on fair visitors, according to Teague. Reeling under "the impact of many wholly unrelated impressions on the consciousness," the average person experienced a lowering of his "mental receptivity" to that of a twelve-year-old.²⁴ Teague presented this observation as a challenge to designers, but fatigue probably rendered people more passive, more open to suggestion, than they normally were. Whatever the case, he insisted that to present his "message" an exhibitor must dramatize it "in visual form so that the average visitor cannot escape its import."²⁵ An exhibit had to relate simply and obviously to its viewers' everyday lives. It had to be brightly colored and full of motion to attract and hold attention. Finally, sections of an exhibit had to be arranged in a "logical order" with a "dramatic structure" leading to a climax. An audience did not leisurely explore an exhibit; it was "moved past the acts." Controlled circulation, both symbolized and expedited by streamlined architecture's flowing interior walls, summarized Teague's philosophy of exhibition design (see figure 141). As a behaviorist, he insisted that after "we lead them [visitors] craftily through a planned maze we should reward them at the end with a chance to rest and relax."²⁶

With this emphasis on movement and drama, common throughout the fair, exhibits attracted more attention to themselves than to the machines, technologies, or processes they represented. The Borden Company won acclaim for a demonstration of mechanical milking carried out for no logical reason on a revolving platform called a "rotolactor." Sound reproduction on magnetized steel tape received attention in AT&T's building. Visitors conversed with one another in chairs on a stage covered with tulips. Their brief talk ended, the stage swung out of sight to be replaced by another on which sat dummies who repeated the conversations. More dramatic was Du Pont's demonstration of insecticides. From thousands of houseflies a technician chose a few to be introduced

"into a glass-walled death chamber" and exterminated "by an atomized spray." Refrigeration, inherently motionless, taxed designers' imaginations. Chrysler's Airtemp division advertised itself with a "frozen forest" of life-size tropical plant forms covered with a thick layer of frost generated by imbedded refrigeration coils. Whenever possible, animated models replaced photographs and charts. This technique reached its apex in Teague's "Ford Cycle of Production" (figure 142) praised by *The Architectural Forum* as "the most impressive display at the fair." A series of concentric steps rose thirty feet above a circular platform a hundred feet in diameter. Eighty-seven mechanical puppets represented steps in the manufacture of an automobile from raw materials, at the bottom, to finished product, three of which perched above on a smaller circular platform. Reminiscent of a wedding cake, the entire 152-ton structure rotated.²⁷

Some visitors no doubt learned something about auto manufacturing from this exhibit. Others took away the message that Ford's operations benefited thousands of people in seemingly unrelated industries. But most, too tired to absorb information, delighted in the mechanics and scope of the display itself. Visitors would soon forget even diluted details of a particular manufacturing process, but they would remember the ingenuity of its demonstration or explanation. Each display functioned as an advertisement intended to leave vague impressions of a corporation's enterprise and public beneficence.

An exposition no longer served as a museum of contemporary civilization but as a vast three-dimensional package for the consumerist way of life. Freed from considering any function other than lubricating the production-distribution machine, industrial designers could concentrate on consumer engineering to create public demand for a future society that would give most benefit to private corporations. This approach considered the average person only as a con-

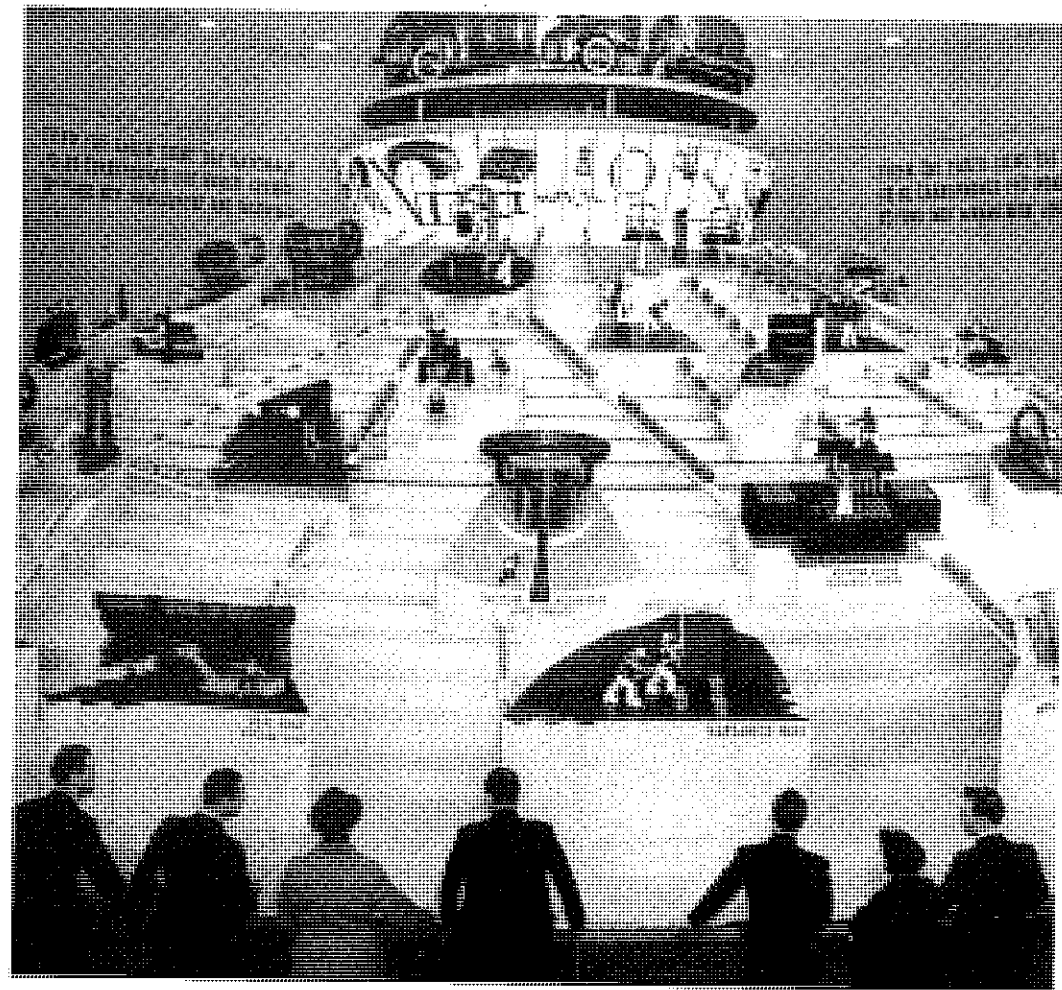


141. Teague. Interior of Du Pont exhibit. Architectural Forum.

sumer, a passive individual receiving impulses, prodded, stimulated, and living packaged experiences. The 1939 fair held no projections, no bottlenecks to jog the visitor's mind into activity. Everything, from architecture to exhibits, was streamlined, rounded off, and reduced to the lowest level of public comprehension. The fair's official publications revealed this lack of content. Earlier expositions, most notably the Columbian, but to an extent the Century of Progress as well, generated serious volumes on the arts, religion, society, and technology. Except for an art catalogue edited by Holger Cahill, the New York fair produced only souvenir booklets and reams of publicity material issued in praise of exhibits.²⁸ The fair's verbiage flowed as smoothly and efficiently as the images in its exhibits and the

people who viewed them. The fair reflected worship of frictionless processing, the lone individual becoming as irrelevant as a single automobile.

The General Motors building (figure 143) with its Futurama, one of the few exhibits to glorify planning as the public understood it, succeeded more than most in directing the flow of visitors.²⁹ Architecture critic Haskell, usually reserved, became "ecstatic over the strange power of the streamlined complex of General Motors, so like some vast carburetor, sucking in the crowd by fascination into its feeding tubes, carrying the people through the prescribed route, and finally whirling them out, at the very center of the display, so they might drift outward in free dispersion."³⁰ As visitors crossed to the Transportation Zone by the

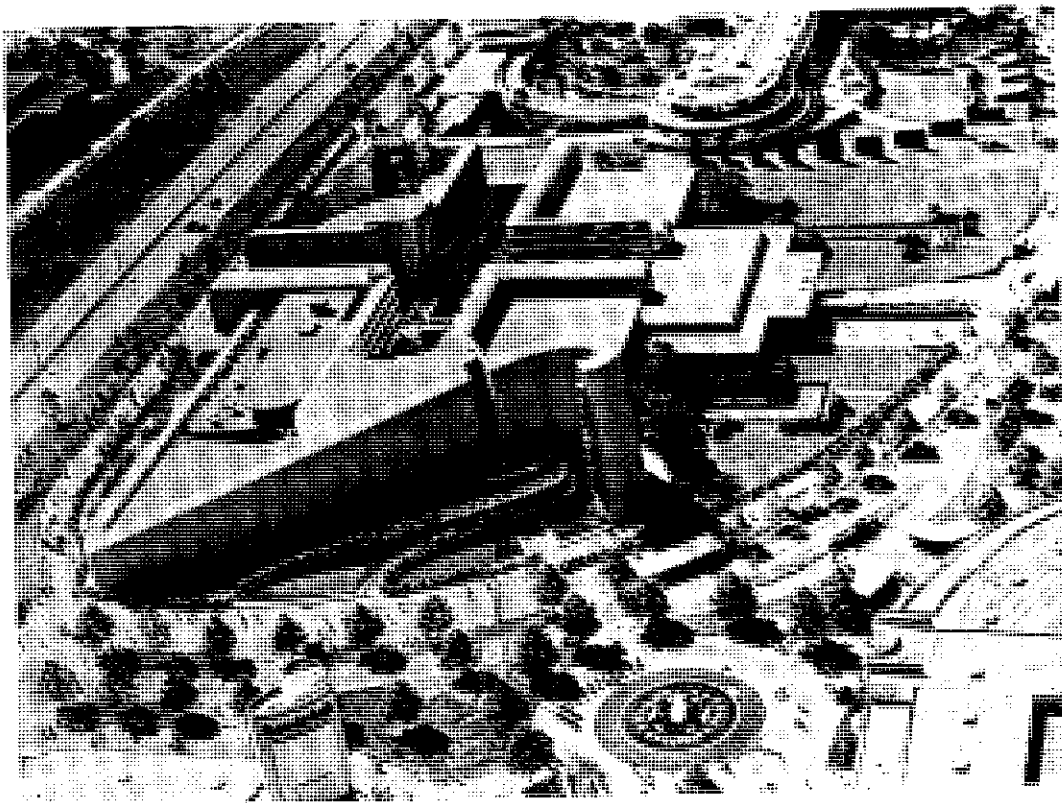


142. Teague. Cycle of Production, Ford building. Architectural Forum.

northern bridge over the Grand Central Parkway, they passed on their left a sharply curved corner of the GM building, its flowing forms "a translation of the streamline forms of auto designs, its surface painted a metallic silver-gray "to simulate Duco finish on automobiles."³¹ The building's long horizontal wall rose gradually along its length, doubling back to end in a high concave screen, which blocked a view of the rest of the Zone and visually hooked visitors onto either of two slender ramps. These ramps, after meandering beside the building, vanished into a narrow slit in the facade. Geddes and his asso-

ciates, who included architect Eero Saarinen, planned this side of the building solely to "catch" the "stream of pedestrians" from the bridge.³²

Those caught, some 27,500 daily, entered a "haunting blue-black" auditorium.³³ As they went down switchback ramps to the front, a recorded voice backed by soothing music directed attention to a huge map of the United States, which electronically compared traffic volume on major highways in 1939 with that predicted for 1960 and then depicted a solution to the mess—a super-highway system. At the front of the audi-



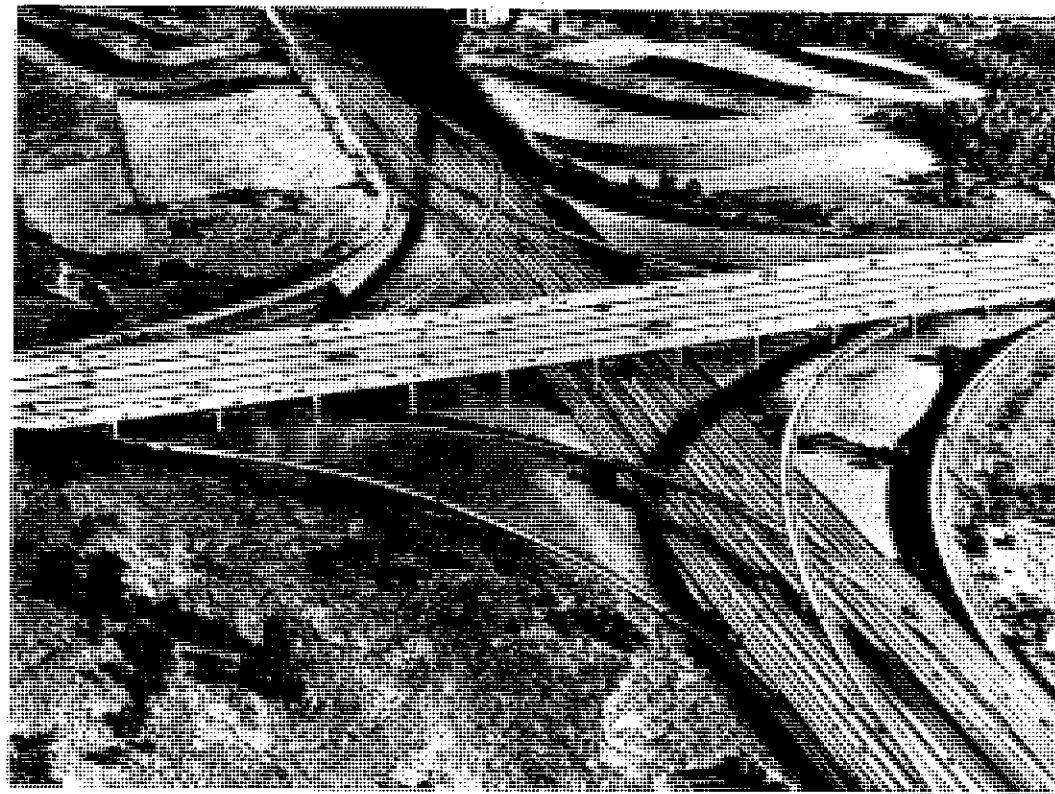
143. Geddes. General Motors building. Geddes Collection.

democratic but also tinged with high class

torium uniformed ushers directed visitors to a row of plush, high-backed seats, "so designed as to suggest a private, traveling opera box."³⁴ As the rubber-tired train—two seats to a car, twelve cars to a train—pulled away from the loading platform, a voice synchronized for each car invited passengers to enjoy a fifteen-minute simulated airplane ride over the America of 1960. Visitors traveled some 1,600 feet, looking through a continuous transparent screen over vast landscape dioramas covering 36,000 square feet on three levels and containing a million trees, half a million buildings, and fifty thousand streamlined automobiles, ten thousand of them in motion.³⁵

For the most part, with two essential exceptions, the projected America of 1960 resembled that of 1939. Such innovations as a scientific orchard with trees under glass, a

giant power dam, and a futuristic amusement park hardly intruded on grand landscapes of farmland, mountains, forests, and rivers. This predictable, if spectacular, background highlighted all the more two major departures from the realities of 1939—a superhighway system and a Corbusian metropolis. Geddes led his captive audience along the route of a monumental fourteen-lane highway, divided in each direction into two fifty-mile lanes, two seventy-five-mile lanes, and a single hundred-mile lane. Grass strips and physical barriers separated individual lanes, joined periodically by acceleration and deceleration lanes, while, when terrain permitted, several miles of land separated the two directions of travel. Stationed in periodic bridges over the highway, according to the narrator, were technicians who monitored traffic flow and radioed directions to motorists for



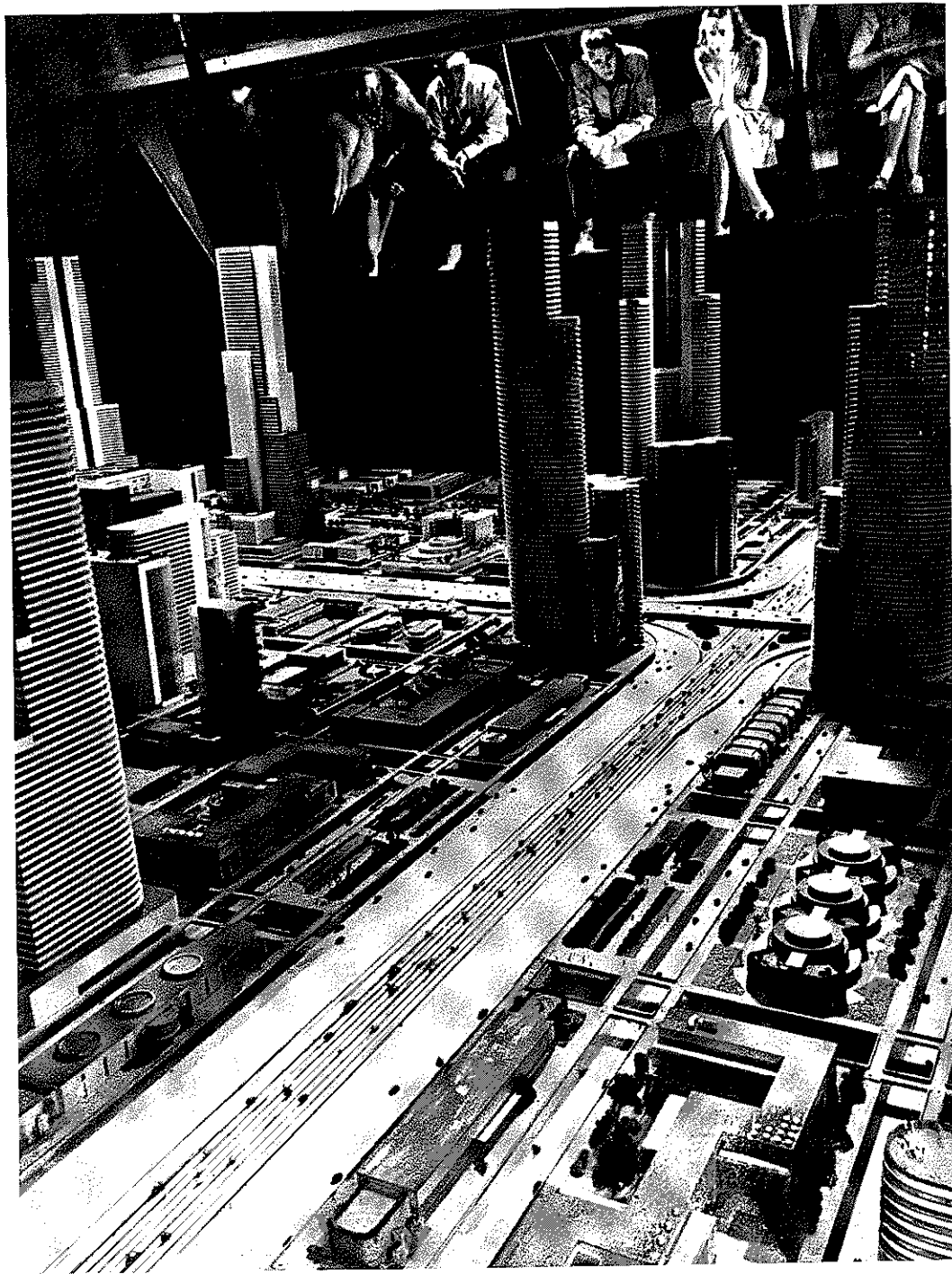
144. Geddes. Highway intersection in the Futurama. Geddes Collection.

entering the highway and changing lanes. A night sequence revealed that headlights were unnecessary because each lane was lit by continuous tube lighting installed in side barriers. At an intersection with another superhighway Geddes replaced the ten-year-old cloverleaf with a maze of ramps making possible a fifty-mile-an-hour ninety-degree turn in either perpendicular direction (figure 144).

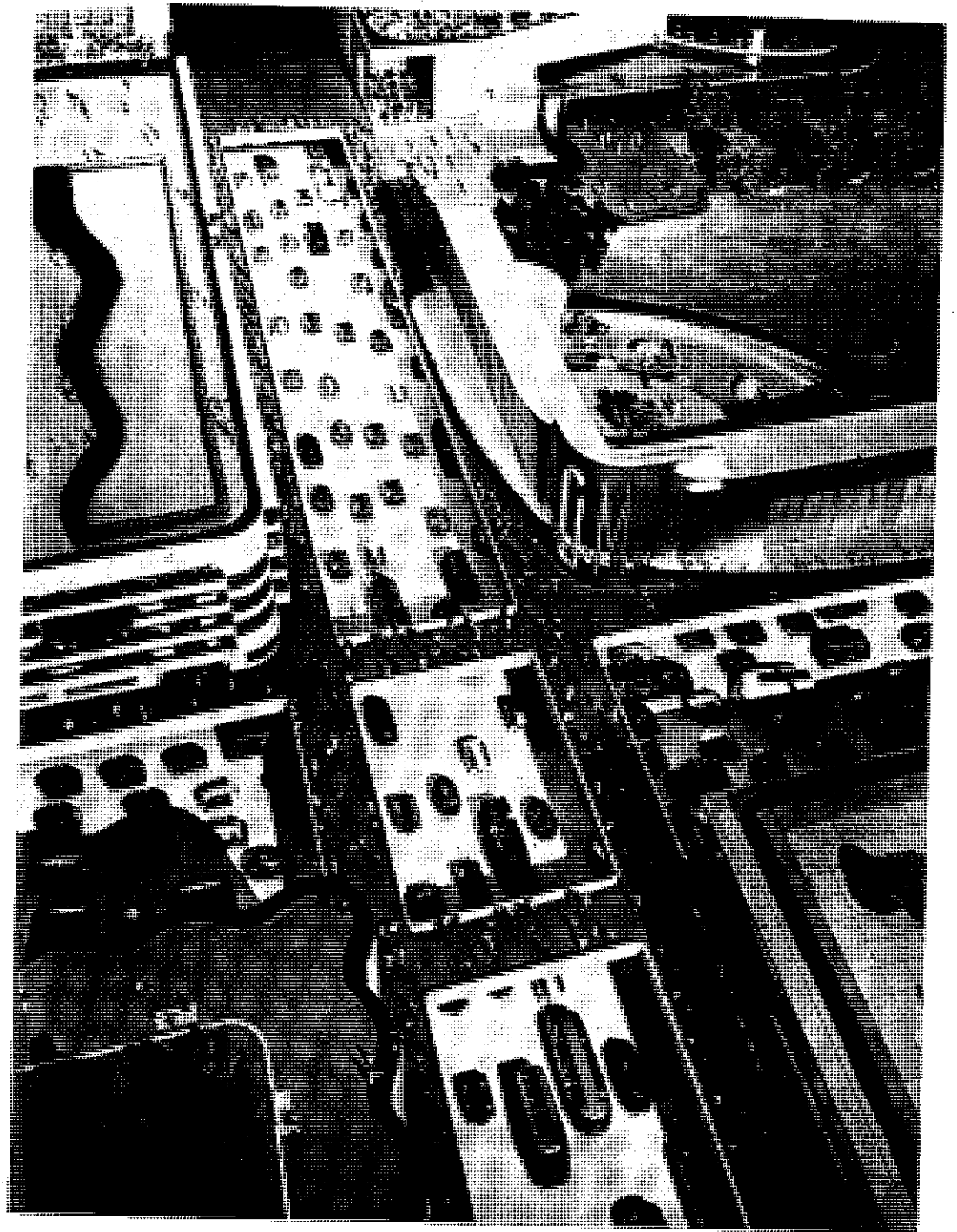
As the highway approached a metropolis patterned on St. Louis, feeder highways doubled its number of lanes, and it crossed a four-level bridge over the river without bottlenecks. Following an approach highway, armchair futurists reached "an American city replanned around a highly developed modern traffic system," as the narrator described it (figure 145). Widely spaced, quarter-mile-high streamlined skyscrapers

separated by parks and lower buildings predominated. Every ten blocks an elevated expressway with lower access roads cut across the city, while all sidewalks were raised above street level and bridged four ways at each intersection. After a close-up view of an intersection (figure 146), visitors emerged from the Futurama to find themselves standing outside in that very intersection (figure 147), streets below filled not with teardrop autos but with current GM models.

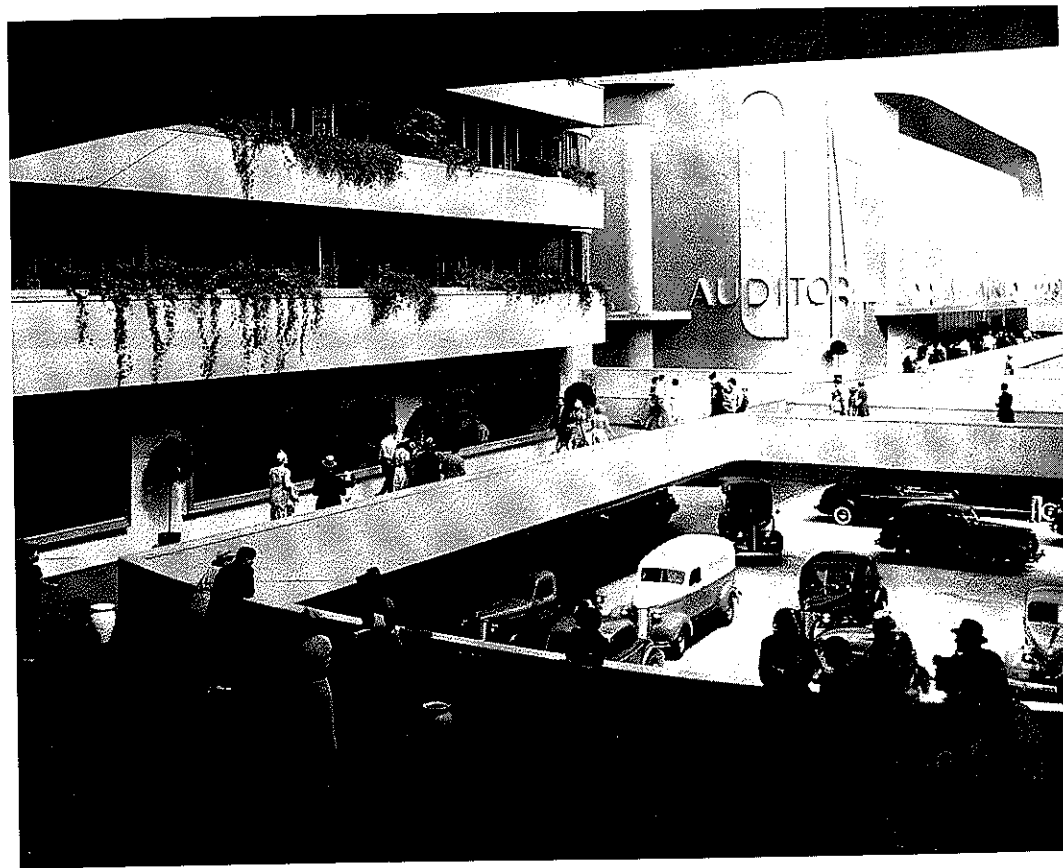
Geddes's Futurama proved to be the hit of the fair, prompting an observer to note that it "combines the thrills of Coney Island with the glories of Le Corbusier."³⁶ Despite the entertainment value of the GM extravaganza, with which the corporation hoped to reap a good return in publicity and auto purchases on an investment of \$8 million, Geddes took



145. Armchair visitors to the Futurama's city of 1960. Geddes Collection.



146. Model street intersection in the Futurama. Geddes Collection.



147. Full-size street intersection in the GM building. Geddes Collection.

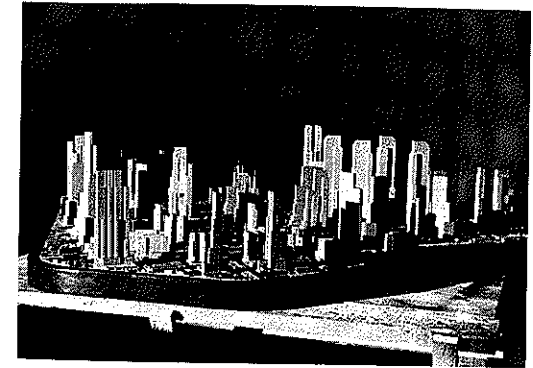
seriously his vision of 1960. Many of its ideas were derivative. William Stott has pointed out that Geddes borrowed the major outlines of his city, as well as a circular airport, from Le Corbusier. In addition, the designer took his pedestrian walkways in every detail from a proposal made by his friend Harvey Wiley Corbett to the New York Regional Plan Association in 1923. And his suggestion of built-in highway lighting temporarily activated by passage of a car past photoelectric cells, an idea too complex for dramatization, came from Raymond Loewy.³⁷ But Geddes since 1931 had been looking for solutions to the problems of urban traffic congestion and mounting deaths on open highways.³⁸ Late in 1936, with the recommendation of Stanley Resor of the J. Walter

Thompson Agency, Geddes signed a contract with Shell Oil to provide models illustrating rural and urban traffic solutions for an advertising campaign. This project introduced him to Miller McClintock, director of Harvard's Studebaker-funded Erskine Bureau for Street Traffic Research.

McClintock, who earned a Harvard doctorate in 1924 with a dissertation on traffic control, was described by *Fortune* in 1936 as the "No. 1 man" in the field.³⁹ His "friction theory" of traffic coalesced with industrial design's predilection for streamlining, for eliminating friction in all areas of life. All automobile accidents and traffic congestion, he found, resulted from one of four frictions: medial, the friction of opposing directions of travel; marginal, the friction of autos with

parked cars, pedestrians, and fixed objects; intersectional; and internal-stream, the friction of automobiles passing others in the same direction of travel, which McClintock found responsible for 47 percent of all accidents. Pedestrians, however, composed 65 percent of urban traffic fatalities.⁴⁰ From these facts came the two solutions of limited-access highways and separation of pedestrians from vehicular traffic. Geddes, however, proposed a novel solution for eliminating urban congestion. In staff meetings dedicated to the Shell project he repeatedly suggested banning private automobiles and constructing large parking garages on urban fringes, from which commuters would be ferried downtown by minibuses. McClintock, the expert consultant, scotched the idea because people could not be bothered with the irritation of switching to another mode of transportation. In the future the city would become a frictionless traffic machine.⁴¹

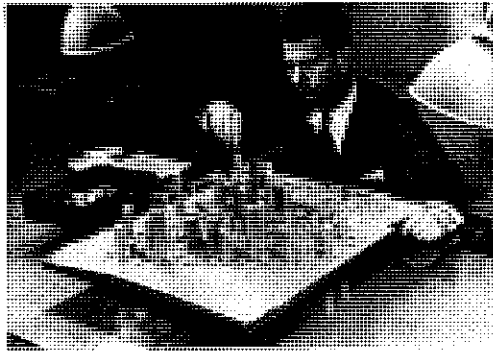
Geddes's Shell project yielded a six-foot triangular model (figure 148) of a "city of tomorrow" that could have been inserted into the Futurama. Shell used photographs of the model in the planned advertising campaign and made a film available to service clubs and chambers of commerce to gain support for a national highway system.⁴² Using slides of the model and of sketches of the superhighway system that he and Geddes had devised, McClintock addressed the National Planning Conference in Detroit on the subject.⁴³ Before Shell's advertisements ceased running, Geddes himself envisioned a world's fair exhibit to dramatize McClintock's theories.⁴⁴ When in May 1938 General Motors abandoned architect Albert Kahn's completed plans in order to sign a contract with Geddes, he had already completed preliminary plans for the entire building and had tried unsuccessfully to sell them to Shell and Goodyear.⁴⁵ Geddes's Futurama went well with GM's long-term goals. President Alfred P. Sloan, Jr., had in 1932 organized a National Highway Users Conference, incor-



148. Geddes. Shell Oil's "city of tomorrow," 1937. Geddes Collection.

porating elements of the automobile, petroleum, and rubber industries, whose purposes included lobbying in Washington for a federally funded highway system, whose convenience would boost automobile sales.⁴⁶ And Geddes's plans for streamlining the flow of urban automobile traffic appealed to a corporation that for several years had bought up streetcar lines, scrapped their equipment, introduced buses, and then sold out, often with a proviso that purchasers not return to rail transit.⁴⁷ The Futurama's metropolis of the future contained no mass transportation other than buses.

General Motors officials hoped the Futurama would arouse public support for a highway system of some sort, whether or not it exactly resembled the one in their diorama. But Geddes, enthralled by his project's scope—monumental on its own scale—hoped to see his vision actualized. In the planning stage his staff discussed details as if they really were designing highways and reconstructing cities. Members of a "traffic bureau" spent hours making certain that every single intersection was "absolutely practical," but this degree of realism was lost on fair-goers gliding by in their upholstered chairs.⁴⁸ Geddes himself incorporated the smallest details in a perspective he had learned twenty-five years before, perched on the highest catwalk of Detroit's Garrick Theatre, an experience that had led him as a



149. Geddes placing buildings in the city of tomorrow. Geddes Collection.

stage designer to emphasize “organizing all phases of stage activity so that they move in a series of traffic patterns, so planned that they cannot collide or interfere with each other.”⁴⁹ In a letter to his wife he recounted the “funny experience” of arranging Futurama buildings on a forty-by-sixty-foot map of St. Louis. He and half a dozen staffers “walked around with pockets and hands full of skyscrapers,” arranging them for a “whole effect” from a bird’s-eye view. She wished she had seen him “playing God . . . plunking down skyscrapers where you want and spending millions as you choose” (see figure 149).⁵⁰ Geddes described this scene with whimsy, but he considered the Futurama a blueprint he hoped to see used.

During early negotiations with GM, Geddes suggested presenting the Futurama “as the result of an independent research [project]” to remove from it “the curse of the advertising angle” and render its principles attractive to “outside agencies such as the Government.”⁵¹ Shortly before the fair’s opening, Geddes arranged a dinner invitation to the White House. Roosevelt listened politely to Geddes’s proposals for a national highway system, but he seemed more interested in a streamlined yacht model the designer brought along.⁵² Geddes also tried to recruit Robert Moses, the one man capable of realizing his urban traffic solution, who had refused earlier to look at the Shell

model.⁵³ Moses prompted an exchange of views by describing Geddes’s plans as “bunk” at an annual meeting of the American Society of Civil Engineers. The nation did not need mammoth cross-country highways. It needed urban expressways to make internal traffic flow more smoothly.⁵⁴ Geddes replied with a press release carried in part by the *New York Times*. Not only, he argued, did Moses show lack of foresight in failing to plan for the cross-country traffic of 1960, but even his own New York expressways and bridges became clogged the moment they opened. In his statement Geddes admitted “great admiration” for Moses as “Park Commissioner.” In fact, Geddes continued, “no one excels him in resetting bushes in a park and finding play spaces for the underprivileged voters,” but “landscaping along a highway does not make it safe for present-day travel.”⁵⁵

With this sarcastic remark Geddes curiously reversed roles with Moses. New York City’s highway czar became a mere decorator, a stylist of highways unconcerned with function, while Geddes, industrial designer and creator of the Futurama highway system, became the serious planner and builder. Over the following months the two men, who were apparently on amiable terms personally, exchanged a series of letters growing out of the brief public controversy. Geddes continued to insist on his work as an accurate blueprint for actual construction, while Moses regarded the Futurama “as work of the imagination.” From Geddes he sought admission “that you don’t pose as an expert . . . that you are simply taking a look into the future, that you don’t want your recommendations to be taken too seriously by practical work-a-day people who must live in their own time.” By admitting so, Geddes would be “paving the way for further recognition as a creative artist.”⁵⁶ Several months later Moses himself paid tribute to Geddes’s aesthetic gifts by awarding him a contract for designing playground equipment.⁵⁷ Thus ended Geddes’s last attempt to gain support

from individuals whose power equalled the scope of his reconstruction project. Undaunted, he ended his Futurama association with a gesture of pure surrealism. Discussing with GM executives the exhibit’s fate at the close of the fair’s second year, he suggested flying around the country with the entire Futurama in a dirigible.⁵⁸

The story of the Futurama, especially Geddes’s extravagant hopes and their eventual frustration, paralleled industrial design’s fate in the thirties and beyond. Whatever his proposals’ worth, Geddes expressed a genuine concern for reconstructing the American environment on a grand scale that extended back through Teague to Calkins, the first publicist of industrial design. In idealistic moments designers believed that their method, which involved reducing friction or removing irritations, would contribute to making life more efficient and thus potentially more fulfilling. From the simplest product to the most complex metropolis, all artifacts of machine-age America would reflect their vision. And the streamlined style would accurately express the function of reducing friction and would provide America a visual coherence never before attained. The world of the future, foreshadowed by the New York World’s Fair of 1939, would embody a designed stability unknown during the uncertain Depression years.

This common vision of industrial design’s larger cultural role was never realized. Not even streamlining, its stylistic embodiment, which in 1939 had seemed the wave of the future, survived World War II intact. In the fifties the austere lines of the International Style dominated American architecture, while “streamlining” referred mostly to Detroit’s tailfins and chrome. The war itself contributed to the vision’s failure. A nation exhausted by fifteen years of deprivation and war naturally embraced a resurgence of the commercial tempo previously experienced in the twenties. Novelty and constant change seemed more desirable than

a stasis that could hardly sustain prosperity. Even more important, the monolithic coherence of industrial design’s machine-age world—and its bent for processing people through curved flow lines—recalled European and Russian totalitarianism. As America entered the Cold War, social planning, a prime concern of society during the Depression, became ideologically suspect. The free enterprise system, certainly as much at odds with design coherence as with social control, became an unquestioned element of the faith of loyal postwar Americans.

Even during the thirties, the American economy lacked the directed unity of purpose required for realization of industrial design’s vision. A designer like Geddes could receive \$8 million to create a model of his planned future, but he had no leverage to ensure its adoption by government. His patron, General Motors, did not regard the project as an actual blueprint but as an exercise in consumer engineering useful for influencing public opinion. The Futurama did contain intricate realistic detail, but its presentation revealed its superficial nature. The designer himself recognized the limitations of the Futurama, which accompanied a brief ride with a vague recorded narration, when he followed it with *Magic Motorways*, a book that described his plans in detail.⁵⁹ Industrial designers, despite their idealistic intentions, could not rise above the designs of their employers. After the war they did not often try to.

Industrial design eventually became institutionalized as a sales technique comparable to advertising. Naive images of social control, like streamlined flow lines, disappeared for the most part, but designers refined their techniques of manipulation in the service of individual corporations with little thought for the total effect. Coherence disappeared as a goal, at least on any scale larger than shopping malls or computerized amusement parks—heirs of the techniques of social control developed for the World’s Fair. When designers “returned from the war,” for

which they had provided camouflage techniques, artillery housings, training manuals, propaganda displays, and a war room for the Joint Chiefs, they concentrated on fueling the flow of goods of the affluent postwar period. An occasional designer continued to express small-scale idealism in an individual product, but the Depression dream of building a harmonious machine-age America dissolved. The pressure of artificial obsolescence, always a major undercurrent in the thirties, finally won out. The streamlined

style, discredited owing to hints of totalitarianism in its smooth-flowing lines and its ideal of permanence, yielded to a flood of extravagant forms whose impermanence and lack of coherence could not be dignified by the word "style." More recent industrial designers have indeed shaped "the world of tomorrow"—its appliances, franchise architecture, and eternally "new" corporate logos—but it is not the world envisioned in their best moments by the founders of the profession.

NOTES

Prologue

1. See Warren I. Susman, "The Thirties," in *The Development of an American Culture*, ed. Stanley Coben and Lorman Ratner (Englewood Cliffs, N.J.: Prentice-Hall, 1970), pp. 179–218; Alfred Haworth Jones, "The Search for a Usable American Past in the New Deal Era," *American Quarterly* 23 (Dec. 1971), 710–24; William Stott, *Documentary Expression and Thirties America* (New York: Oxford University Press, 1973); and Richard H. Pells, *Radical Visions and American Dreams: Culture and Social Thought in the Depression Years* (New York: Harper and Row, 1973), particularly chapters "Documentaries, Fiction, and the Depression" and "The Decline of Radicalism, 1935–1939."
2. Steinbeck (New York: Viking, 1939), p. 176.
3. Robert S. Lynd and Helen Merrell Lynd, *Middletown in Transition: A Study in Cultural Conflicts* (New York: Harcourt, Brace, 1937), p. 469.
4. The speech, delivered Nov. 1, 1933, is in the Egmont Arens Collection, George Arens Research Library for Special Collections at Syracuse University (hereafter referred to as *Arens*), box 51. The A&P Carnival is described in *Official Guide Book of the Fair* (Chicago: A Century of Progress, 1933), p. 103.
5. Lynd, *Middletown*, p. 247.
6. Clipping, *Arens*, box 59.
7. Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (1948; rpt., New York: W. W. Norton, 1969), p. 3.
857. See also William Leuchtenburg, *The Perils of Prosperity 1914–32* (Chicago: University of Chicago Press, 1958), p. 194; Thomas C. Cochran, *American Business in the Twentieth Century* (Cambridge: Harvard University Press, 1972), p. 31; James J. Flink, "Three Stages of American Automobile Consciousness," *American Quarterly* 24 (Oct. 1972), 462–63; and Gilman M. Ostrander, *American Civilization in the First Machine Age: 1890–1940* (New York: Harper Torchbooks, 1972), pp. 9–10.
3. See Leuchtenburg, pp. 178–79; George Sonle, *Prosperity Decade: From War to Depression: 1917–1929* (New York: Rinehart, 1947), pp. 127–31. On factory management see Samuel Haber, *Efficiency and Uplift: Scientific Management in the Progressive Era 1890–1920* (Chicago: University of Chicago Press, 1964).
4. U.S., Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1957* (Washington, D.C.: Government Printing Office, 1960), pp. 462, 14.
5. See Douglas A. Fisher, *Steel Serves the Nation 1901–1951: The Fifty Year Story of United States Steel* (New York: U.S. Steel Corporation, 1951), p. 41; William S. Dutton, *Du Pont: One Hundred and Forty Years* (New York: Scribner, 1951), pp. 295–301.
6. Lynd and Hanson, "People as Consumers," pp. 866–67. See also Daniel J. Boorstin, *The Americans: The Democratic Experience* (New York: Random House, 1973), pp. 422–28.
7. See comments on class distinctions, *ibid.*, pp. 860–61. The next two paragraphs are based on charts on pp. 896–901.
8. *Historical Statistics*, p. 417.
9. Boris Emmet and John E. Jeuck, *Catalogues and Counters: A History of Sears, Roebuck and Company* (Chicago: University of Chicago Press, 1950), pp. 338–57.
10. Malcolm M. Willey and Stuart A. Rice, "The Agencies of Communication," in *Recent Social Trends*, p. 216. For statistics see Lynd and Hanson, "People as Consumers," p. 909; *Historical Statistics*, p. 491.
11. Lynd and Hanson, "People as Consumers," p. 874.

1. A Consumer Society and Its Discontents

1. Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (1948; rpt., New York: W. W. Norton, 1969), p. 121.
2. Robert S. Lynd with Alice C. Hanson, "The People as Consumers," in *Recent Social Trends in the United States: Report of the President's Research Committee on Social Trends* (New York: McGraw-Hill, 1933), p.

40. Geddes might titillate readers of *Ladies' Home Journal* with the curved concrete lines of his "House of Tomorrow," 48 (April 1931), 12-13, 162, but magazines dedicated to homes and domestic interiors devoted most of their space to traditional styles. The "Town of Tomorrow" erected at the New York World's Fair of 1939 by national suppliers of construction materials did not reflect the streamlined architecture of its surroundings. Traditional homes equipped with the latest appliances outnumbered vaguely modern ones by four to one.
41. Hal Foust, "Professor Tries Stream Lines for Buildings," *Chicago Daily Tribune*, Nov. 22, 1934, clipping, box 59, *Arens*. The following discussion has been influenced by two perceptive articles on streamlining and architecture: David Gebhard, "The Moderne in the U.S. 1920-1941," *Architectural Association Quarterly* 2 (July 1970), 4-20; Kathleen Church Plummer, "The Streamlined Moderne," *Art in America* 62 (Jan.-Feb. 1974), 46-54.
42. Architectural historians have noted the similarity of Saarinen's Dulles airport terminal (1958-1963) to one of Mendelsohn's visionary sketches of 1917. With the TWA terminal at Kennedy airport (1959-1962) and the Gateway Arch at St. Louis (completed in the late sixties), it can be seen as a culminating expression of streamlined architecture. All three would have seemed startling but not out of place in the thirties.
43. See Jordy, *American Buildings and Their Architects: The Impact of European Modernism in the Mid-Twentieth Century* (Garden City, N.Y.: Doubleday, 1972), pp. 87-164.
44. See "Albert Kahn," *The Architectural Forum* 69 (Aug. 1938), especially 97-101, 108.
45. "California Gold Rush County Streamlines Its Courthouse," *Architectural Record* 84 (July 1938), 46-48.
46. See "Twentieth Century Limited," *Modern Plastics* 15 (July 1938), 21-23, 62, 64; "New Trains," *The Architectural Forum* 69 (Sept. 1938), 175-82; "Henry Dreyfuss Designs New 'Century' Train," *Design* 40 (Feb. 1939), 5-7; and Lucius Beebe, *20th Century* (Berkeley: Howell-North, 1962), pp. 51-53, 158-66. Both Plummer, "Streamlined Moderne" (p. 48), and Bush, *Streamlined Decade* (pp. 151-53), have discussed the utopian vision of enclosed environments, the latter concluding that approximations "provided psychic insulation from the sight of bread lines, riots and the streets of Hooverville."
47. Johnson, *Machine Art* (New York: Museum of Modern Art, 1934), n. p.
48. Bauer, "Machine-Made," *The American Magazine of Art* 27 (May 1934), 270.
49. "Beauty of Form in Machine Art," *Design* 35 (April 1934), 9.
50. *Art in Our Time* (New York: Museum of Modern Art, 1939), pp. 332-34.
51. Mumford, *Technics and Civilization* (New York: Harcourt, Brace), p. 253.
52. Barr to Geddes, Dec. 4, 1934, file 296, *Geddes*.
53. McAndrew, "'Modernistic' and 'Streamlined,'" *The Bulletin of the Museum of Modern Art* 5 (Dec. 1938), 2.
54. Hitchcock, "Some American Interiors in the Modern Style," *The Architectural Record* 64 (Sept. 1928), 238.
55. "Wins \$500 Art Prize," *New York Times*, Oct. 6, 1928, p. 21.
56. Blanche Naylor, "The Designer and Industry," *Design* 34 (Sept. 1932), 83.
57. *Advertising Arts*, Jan. 1934, p. 48.
58. "Art and Machines," *The Architectural Forum* 60 (May 1934), 331. Ironically, the major industrial designers boycotted the National Alliance exhibit of 1935 because they found the organization's aesthetic standards lacking. See "Art: When Manufacturers Run the Show, Designers Won't Play," *News-Week*, April 27, 1935, p. 24; "The Annual Industrial Arts Exposition," *Modern Plastics* 12 (May 1935), 22-23.
59. Moholy-Nagy, "Design Possibilities" (1944), in *Moholy-Nagy*, ed. Richard Kostelanetz (New York: Praeger, 1970), p. 85.
60. D. C. O'Connell, "Industrial Design: Mechanical Technology of Metals," *Architecture* 73 (Jan. 1936), 20.
61. On plastics and streamlined design see Franklin E. Brill, "What Shapes for Phenolics," *Modern Plastics* 13 (Sept. 1935), 21; Brill and Joseph Federico, "Decorative Treatments for Molded Plastics," *Product Engineering* 8 (Jan. 1937), 25; Frank H. Johnson, "Designing Plastic Parts," *Product Engineering* 9 (Feb. 1938), 61; and Raymond P. Calt, "A New Design for Industry," *The Atlantic Monthly* 164 (Oct. 1939), 541-42.
62. Sheldon Cheney and Martha Candler Cheney, *Art and the Machine: An Account of Industrial Design in 20th-Century America* (New York: Whittlesey House, 1936), pp. 217, 291, 98, 102.
63. Teague, "Plastics and Design," *The Architectural Forum* 72 (Feb. 1940), 93-94.
64. Pevsner, *Pioneers of Modern Design: From William Morris to Walter Gropius* (Balti-

- more: Penguin, 1968), p. 210.
65. Onderdonk, *The Ferro-Concrete Style: Reinforced Concrete in Modern Architecture* (New York: Architectural Book Publishing Co., 1928), pp. 221, 195.
66. Bragdon, *The Frozen Fountain: Being Essays on Architecture and the Art of Design in Space* (New York: Alfred A. Knopf, 1932), pp. 11-12.
67. Ward, "Towards a New Era of Speed," *Travel* 62 (April 1934), 9-10, 60.
68. Pommer, "Loewy and the Industrial Skin Game," *Art in America* 64 (March-April 1976), 46.
69. *The Streamlined Decade*, p. 4.
70. Thompson as quoted by Bush, *Streamlined Decade*, pp. 9-10.
71. Geddes, *Horizons* (Boston: Little, Brown, 1932), p. 45.
72. Haskell, "From Automobile to Road-Plane," *Harper's Monthly Magazine* 169 (July 1934), 173.
73. Henry Glade, "Future City on Earth" (April 1942), as quoted by Plummer, "Streamlined Moderne," p. 49.
74. Peter Müller-Munk, "The Future of Product Design," *Modern Plastics* 20 (June 1943), 77, 144.
75. Paul T. Frankl, *Machine-Made Leisure* (New York: Harper, 1932), pp. 117, 120.
76. "What Man Has Joined Together . . .," *Fortune* 13 (March 1936), 71.
77. Burvil Glenn, "A New Definition of Design," *Design* 37 (June 1935), 8.
78. Albert F. Byers, "Eye Appeal in Machinery Design and Finish," *The Iron Age*, May 14, 1936, p. 53.
79. *Art and the Machine*, p. 20.
80. *Technics and Civilization*, p. 357.
81. "Introduction," *The Practice of Design*, ed. Herbert Read (London: Lund Humphries, 1946), p. 21.
9. **A Microcosm of the Machine-Age World**
1. On the original theme and Teague's influence see "World's Fair, New York Style," *Business Week*, Sept. 28, 1935, p. 18; Donald J. Bush, *The Streamlined Decade* (New York: George Braziller, 1975), p. 159.
2. "Robert (Or I'll Resign) Moses," *Fortune* 17 (June 1938), 138. See also Robert A. Caro, *The Power Broker: Robert Moses and the Fall of New York* (New York: Vintage, 1975), pp. 1082-85.
3. *Official Guide Book: New York World's Fair 1939* (New York: Exposition Publications, 1939), pp. 20, 18. Various editions have different paginations, but there is no way to distinguish them.
4. *Ibid.*, p. 27.
5. *Ibid.*
6. As quoted by R. L. Duffus, "A City of Tomorrow: A New Design of Life," *New York Times Magazine*, Dec. 18, 1938, p. 4.
7. As quoted by Duffus, p. 23.
8. Duffus, p. 4.
9. "San Francisco Golden Gate Exposition 1939," *The Architectural Forum* 70 (June 1939), 464. The comment appears in a comparison of the two fairs.
10. Morton Eustis, "Big Show in Flushing Meadows," *Theatre Arts Monthly* 23 (Aug. 1939), 573.
11. On the theme exhibit consult "Scheme for the Theme Exhibit," Dec. 13, 1938, a spiral notebook containing text, illustrations, and diagrams, 1972.88.258, *Dreyfuss*.
12. Eustis, "Big Show," p. 575.
13. Loewy designed the locomotive specifically as a fair exhibit, according to his letter to Merle Armitage, Dec. 23, 1938, Merle Armitage Collection, Humanities Research Center, University of Texas at Austin.
14. Hamlin, "World's Fairs/1939 Model," *Pencil Points* 19 (Nov. 1938), 676.
15. See clippings in file on Crystal Gazing Palace/TH-13/i-1, *Geddes*.
16. As quoted by Vivian Vorsanger, "Designers at the Fair," *Printers' Ink Monthly* 35 (Sept. 1937), 22.
17. Teague, "Building the World of Tomorrow: The New York World's Fair," *Art and Industry* 26 (April 1939), 127, 134.
18. Teague, "Industrial Art and Its Future," *Art and Industry* 22 (May 1937), 193.
19. Whalen, "Building the World of Tomorrow," *New York World's Fair 1939* (New York: New York World's Fair, 1936), n. p.
20. Whalen, "What the Fair Means to Business and Industry," *New York World's Fair Bulletin* 1 (June 1937), 1. Emphases mine.
21. Haskell, "To-morrow and the World's Fair," *Architectural Record* 88 (Aug. 1940), 68.
22. Teague, "Exhibition Technique," *American Architect and Architecture* 151 (Sept. 1937), 33.
23. Teague to Fred L. Black of Ford, April 30, 1941, box WDT Sr 3, *Teague*.
24. Teague, "Exhibition Technique," pp. 31-32.

25. Teague to Robert Gregg of U.S. Steel, April 5, 1937, reel 30A, *Teague*.
26. Teague, "Exhibition Technique," pp. 32-34.
27. On these exhibits see *Official Guide*, p. 85; *Science at the New York World's Fair 1939* (mimeographed booklet), p. 10; *ibid.*, p. 18; "Notes on the Design of Chrysler Motors Exhibit," publicity release, *Loewy*; and "New York World's Fair 1939," *The Architectural Forum* 70 (June 1939), 413.
28. Fair publications are described in *Official Guide*, pp. 14-15.
29. Bush discusses the Futurama briefly in *The Streamlined Decade*, pp. 159-63. Another historical account is William Stott's perceptive "Greenbelt and Futurama: The Heavenly Cities of the 1930s," *The Journal of the American Studies Association of Texas* 4 (1973), 18-29. Robert Coombs's "Norman Bel Geddes: Highways and Horizons," *Perspecta* 13/14 (1971), pp. 11-27, contains two continuous texts separated by photographs. The upper text is copied verbatim, with some passages omitted but no original material added, without credit, from Geddes, "Description of the General Motors Building and Exhibit to the New York World's Fair," Sept. 8, 1939, a 37-page typescript in file 381, *Geddes*. The lower text incorporates three hundred lines of verbatim material, not set off by quotation marks, from two folders in file 381: "Futurama Conveyor System" and "G M Intersection World's Fair." Despite Coombs's cavalier treatment of scholarly conventions, "his" article provides the fullest published description of the Futurama and the GM building.
30. Haskell, "To-morrow and the World's Fair," p. 71.
31. "Description of the General Motors Building," p. 1; list of building specifications, Aug. 9, 1938; both file 381, *Geddes*.
32. "Description," p. 1, file 381, *Geddes*. Saarinen was credited with forty-six days of work on the project, including the lion's share of scale layouts, sketches, and final drawings for the building's exterior, in "Estimate for General Motors/N.Y. World's Fair Exhibit," prepared by Worthen Paxton, April 27, 1938, file 381, *Geddes*. In a letter to the author, Nov. 5, 1976, Garth Huxtable described Saarinen as "the star designer" on the project but emphasized its collaborative nature.
33. Eustis, "Big Show in Flushing Meadows," p. 571.
34. "Futurama Conveyor System," file 381, *Geddes*.
35. This and following paragraphs are based on "Description"; *Futurama*, a souvenir booklet containing a full text of the recorded narration; other materials in file 381; and films taken from the moving chairs, now part of *Geddes*.
36. John Mason Brown, "Norman Bel Geddes' Addition to the Fair," *New York Post*, May 11, 1939, p. 12.
37. On these borrowings see Stott, "Greenbelt and Futurama," pp. 25-26; Thomas Adams, *The Building of the City: Regional Plan: Volume Two* (New York: Regional Plan of New York, 1931), pp. 306-13, 412-15; Loewy, "The Evolution of the Motor Car," *Advertising Arts*, March 1934, p. 39.
38. Geddes requested ideas on improving traffic flow and lane separation at bridges in a memo to a Mr. MacMurchy of his staff, Sept. 3, 1931, file 16, *Geddes*.
39. "Unfit for Modern Motor Traffic," *Fortune* 14 (Aug. 1936), 94. See also "Miller McClintock," *The National Cyclopaedia of American Biography* 44 (New York: James T. White, 1962), 14-15.
40. From a memo of a meeting of McClintock with Geddes, Dec. 1, 1936, file 356, *Geddes*.
41. See memoranda of staff meetings on Nov. 12, 1936; Nov. 16, 1936; and Dec. 1, 1936; all file 356, *Geddes*.
42. The ads appeared in *Life* and *The Saturday Evening Post* from July to Nov. 1937. For clippings regarding showings of the film and model see "Record Copy Book/Shell/Clippings," file 356, *Geddes*.
43. See "At the Wheel," *New York Times*, June 6, 1937, section 12, p. 12; McClintock, "Of Things to Come," in *New Horizons in Planning: Proceedings of the National Planning Conference, Held at Detroit, Michigan, June 1-3, 1937* (Chicago: American Society of Planning Officials, 1937), pp. 34-38.
44. Bruce Bliven, Jr., "Metropolis: 1960 Style," *The New Republic*, Sept. 29, 1937, p. 212.
45. The contract, in file 381, *Geddes*, was signed on May 3, 1938. Worthen Paxton's "Estimate for General Motors/N.Y. World's Fair Exhibit," file 381, *Geddes*, which contained a detailed breakdown of work already completed on the project, was dated April 27, 1938. Former staffer Garth Huxtable, in a letter to the author, Nov. 5, 1976, described how the staff hastily substituted the name of General Motors for that of Goodyear on all the plans and sketches.
46. See Bradford C. Snell, "American Ground Transport," in *The Industrial Reorganization*

- Act: Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary United States Senate . . . on S. 1167* (Washington, D.C.: Government Printing Office, 1974), part 4A, p. A-44. Geddes included this benefit in his sales pitch to GM, but it was dropped from an otherwise identical list of goals announced to the public by GM. See "General Motors Presentation that closed the deal," file 384, *Geddes*; GM press release, July 20, 1938, file 381, *Geddes*.
47. Snell, pp. A-28 to A-31. GM refuted other charges leveled by Snell but failed with this one. See "The Truth about 'American Ground Transport,'" pp. A-112 to A-124.
48. See notes compiled later, in "G M Intersection World's Fair," file 381, *Geddes*.
49. Geddes to John D. Williams, Jan. 28, 1947, autobiography, Jamaica version, ch. 23-32, *Geddes*.
50. Geddes to Frances Waite Geddes, Dec. 13, 1938, in file "Personal Correspondence between Norman Bel Geddes and Frances"; Frances Waite Geddes to Geddes, Dec. 14, 1938, in file "Letters from Frances Waite Geddes to Norman Bel Geddes"; both *Geddes*.
51. Minutes of a meeting, Jan. 27, 1938, file 381, *Geddes*.
52. According to a letter from Geddes to Henry Waite, March 28, 1939, autobiography, ch. 79, *Geddes*. There is no reason to think Geddes's presentation a determining factor in Roosevelt's appointment two years later of an Inter-regional Highway Committee—whose purpose was to plan a national highway system to relieve both unemployment and traffic congestion in the postwar period. See Mark Howard Rose, "Express Highway Politics, 1939-1956" (Ph.D. diss., Ohio State University, 1973), p. 61.
53. According to a memo from "L. W." to Geddes and Worthen Paxton, June 16, 1937, and a letter from Geddes to Moses, July 8, 1937, both in file 356, *Geddes*.
54. See "Moses Envisages Future Highways," *New York Times*, Jan. 21, 1940, section 1, p. 11; "Moses Calls Bel Geddes's Plan of City-Shunning Roads 'Bunk,'" *New York Herald Tribune*, Jan. 21, 1940, clipping in file 397, *Geddes*; and "Super-Highways," *New York Times*, Jan. 28, 1940, section 4, p. 8.
55. "Fair's Theme Song Has Its Premiere," *New York Times*, Feb. 3, 1940, p. 9. The full text of the release is in file 397, *Geddes*.
56. Moses to Geddes, March 18, 1940, file 384, *Geddes*.
57. File 409, *Geddes*.
58. "Presentation Plan," April 24, 1940, file 381, *Geddes*. In fact the diorama was broken up.
59. Geddes, *Magic Motorways* (New York: Random House, 1940).