

# Casa del Sol/FUTURE CITY: An Ecology that Sustains

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*Fig. 1. Soliricundo: 6th Sun*  
The aboriginal people of South America and Mexico predicted that, in 2012, the sun would become angry and destroy the earth unless people learned to live in harmony with nature.

## INTRODUCTION

This paper explores the collaboration between the Cherry Tree Association, Inc. (CTA), a grass-roots organization from New York City's South Bronx and two local institutions, New York Institute of Technology's School of Architecture and Design (NYIT) and the School of Architecture, Urban Design and Landscape Architecture at The City College of New York (CCNY). In 2000, Cherry Tree's Rafael Bueno and Lisa Westberg, approached both schools for help with obtaining political and financial support for Casa del Sol/FUTURE CITY, a project to renovate a once-abandoned apartment building as a community cultural center. The project is intended to foster economic and social empowerment through cultural and artistic expression, and to link the

local and global struggles for economic justice by providing a home base for indigenous peoples in New York City.

Cherry Tree's mission is to live in harmony with the earth—even in apparently inhospitable, human-made environments. Central to this philosophy is the incorporation of traditional attitudes towards conservation of resources and an emphasis on communal living. One objective is to bring FUTURE CITY as close to zero-emissions as possible, thereby reducing the amount of harmful chemicals and gases added to the environment. Equally central is fostering dialogue among people with differing perspectives; in this case students, faculty, and alumni from the two schools, as well as community residents, professional consultants and contractors contributed to the project. This process, which continues, has created an observable "social ecology" that follows Cherry Tree's ambitions for the FUTURE CITY.<sup>1</sup>

In spring 2001, NYIT allowed Professor Michele Bertomen to offer a fourth-year design studio addressing the site and program of Casa del Sol. At the same time City College Architectural Center (CCAC), a community design center at CCNY, agreed to provide Cherry Tree with technical assistance and to collaborate with NYIT. In the end, CCAC and Cherry Tree helped shape the work of the studio, and the students' efforts fed Cherry Tree's goals for advancing the project. Students from both schools produced a set of as-built drawings as a base for future construction documents and filing with the City. NYIT students worked in teams on technical research

and to produce six design alternatives. Faculty and alumni from both schools offered design and technical reviews, as did consultants in sustainable design. NYIT students had their mid-term review at City College, and for final presentation the entire team produced an exhibition and symposium on-site at Casa del Sol.<sup>2</sup>

In 2002, Bertomen led a course at NYIT entitled Project Integration to investigate the synthesis of environmental and social objectives raised by the earlier studio. Their study of building systems contributed to the growing work of the "design team"<sup>1</sup> that Rafael Bueno assembled around the project, now including the firm Brooklyn Architects Collective, Greenstreets, a builder of sustainable buildings and Alternative Power, a solar energy consultant/contractor. CCAC continues to provide support, as do recent alumni from NYIT.<sup>1</sup> This group helped Cherry Tree secure \$300,000 from New York State's energy agency for renovations that will stabilize the building and allow the organization to occupy a ground-floor storefront office, powered by new photo-voltaic panels to be installed on the roof.

As development inches forward, FUTURE CITY will be built on a network of engagement, not distance, of integration, not compartmentalization, and of common sense, not expertise. Yet, the lessons of this novel paradigm, for both students and instructors, emerged slowly as we collaborated with our clients and learned to adapt our own structures for education and design to their philosophy.



*Fig. 2. Aerial photograph of project area. Wedged between blocks of public housing and the elevated highways of Urban Renewal, Casa del Sol occupies a sliver of space between New York City Housing Authority and Department of Transportation controlled territories.*



*Fig. 3. Casa del Sol/FUTURE CITY as it exists today. The photograph is taken looking south towards the Bruckner Expressway.*

## HISTORY AND CONTEXT

The building now used as Casa del Sol is the last remnant of a vibrant urban fabric that once existed along Bruckner Boulevard in the South Bronx. The brick and limestone building at 672-674 East 136th Street was constructed between 1915 and 1920 as part of a pair of six-story, H-shaped, multi-family buildings. Its twin, almost identical in plan, fronted on Bruckner Boulevard, sharing a rear courtyard and a fire passage to the street.

This building complex improved considerably on the typical tenements of Manhattan's Lower East Side, where many residents of Mott Haven had lived before migrating north. Compared to Old Law Tenements, where toilets were shared and many rooms had windows opening onto shafts less than five feet across, the buildings were luxuriously modern. As a pair, they possessed a civic character and monumentality not seen in the typical 25-foot wide tenement. Tiered entry courts led from the street to a first-floor entrance elevated over a street-level commercial base. The arrangement enlivened the street while affording inhabitants of this workingman's palazzo<sup>3</sup> a domestic realm removed from outside the activity.

During the 1950's construction projects of an enormous scale — the Triborough Bridge, super-blocks of high-rise public housing and the elevated Bruckner Expressway — dismantled the balance of uses in the old neighborhood. The southern building of the pair was demolished for the elevated roadway, and in 1961 the area was rezoned for manufacturing uses.<sup>4</sup> As the site of Casa del Sol was of insufficient size<sup>5</sup> or visibility for a profitable real-estate venture, it never attracted redevelopment. Instead, the apartments passed to residents of progres-

sively lower incomes as the neighborhood declined. Tenants were at the mercy of unscrupulous landlords, and the City has effectively owned the building for back taxes since the 1980's. The Cherry Tree Association has its roots in efforts from this period to organize the tenants, many of whom were artists, in an unsuccessful bid to take over the building with the City's support.

### URBAN CAMOUFLAGE

Casa del Sol's rough appearance is both façade and armor for CTA's enterprise. Razor wire and blocked-up windows belie the more positive signs of habitation: plantings in the garden, murals, and graffiti linking local and global action ("CLEAN UP AFTER YOUR DOG—END FASCISM"). The documentation of this disguise was our first task. However, weather conditions on the site and the building's dilapidated state introduced to the design studio a new concept of site analysis

We began measuring the building in February, the coldest, wettest month of that year. Prevailing north winds battered students surveying the parapets, facades and exterior dimensions. On the interior, the building lacked heat or electric lighting. The boiler sat Leviathan-like in a pool of water regularly replenished by leaks in the plumbing.<sup>6</sup> Inside, entire floors remained abandoned. On the lower floors, apartments with blocked windows afforded limited light for surveying. In these closed-off areas many apartments exhibited evidence of the clashes between the last tenants and the corrupt mechanisms that led to their eviction. Students worked amidst heaps of debris, holes in the floor revealing dead animals, and heaps of unidentifiable garbage; the smell of cockroaches and decay was choking.

By contrast, the CTA troupe showed us the spaces they had strategically cordoned off on the southern side of the building for use during the cold months. Rooms were remarkably clean and spare, containing evidence of brief stays of monastic frugality and artistic production. Workshops on the first and second floor were neat and well organized. On the top floor, spaces had been cleared for the "sanctuary", a gathering space for communal activities, as well as a study and an extensive library

### NO OUTSOURCING

The infrastructure of Casa del Sol is primitive, but it works. Most importantly, it is easily fixed if any part



*Fig. 4. Students and CTA's Rafael Bueno discussing the project around the heat of a wood-burning stove made from an oil barrel.*

breaks down. Rooms are heated by wood stoves made from oil barrels, with venting systems rigged to avoid the unpredictable wind patterns on the site. Lighting is from candles. Computer and telephone equipment is powered in part by the sun, with two archaic PV panels attached to a car battery mounted on the roof. In emergencies the light pole at the corner can be tapped for power.

While these conditions are unorthodox, they illustrate CTA's ambitions for a decentralized, self-maintained network of energy production. Moreover, CTA has adapted to the availability of resources. Electric lighting is not necessary for many collective activities, which coincide with the hours of daylight. Large windows facing onto the CTA Garden naturally ventilate the ground floor Adverse Possession Theater. On the first floor, a gallery is lit by windows opening to the southeast. A remarkable feature of the original H-shaped residential building is that all rooms have windows. Where partitions have been removed to adapt the apartments to current use, the shell provides shallow but generous spaces, many with two or three exposures and cross ventilation.

### HIDE IN PLAIN SITE

Our client had long recognized that academic and bureaucratic divisions could work to its advantage. In fact, Cherry Tree's continued existence might be ascribed to its ability to hide out within bureaucratic fissures, between the jurisdictions of agencies charged with planning, housing development, code enforce-

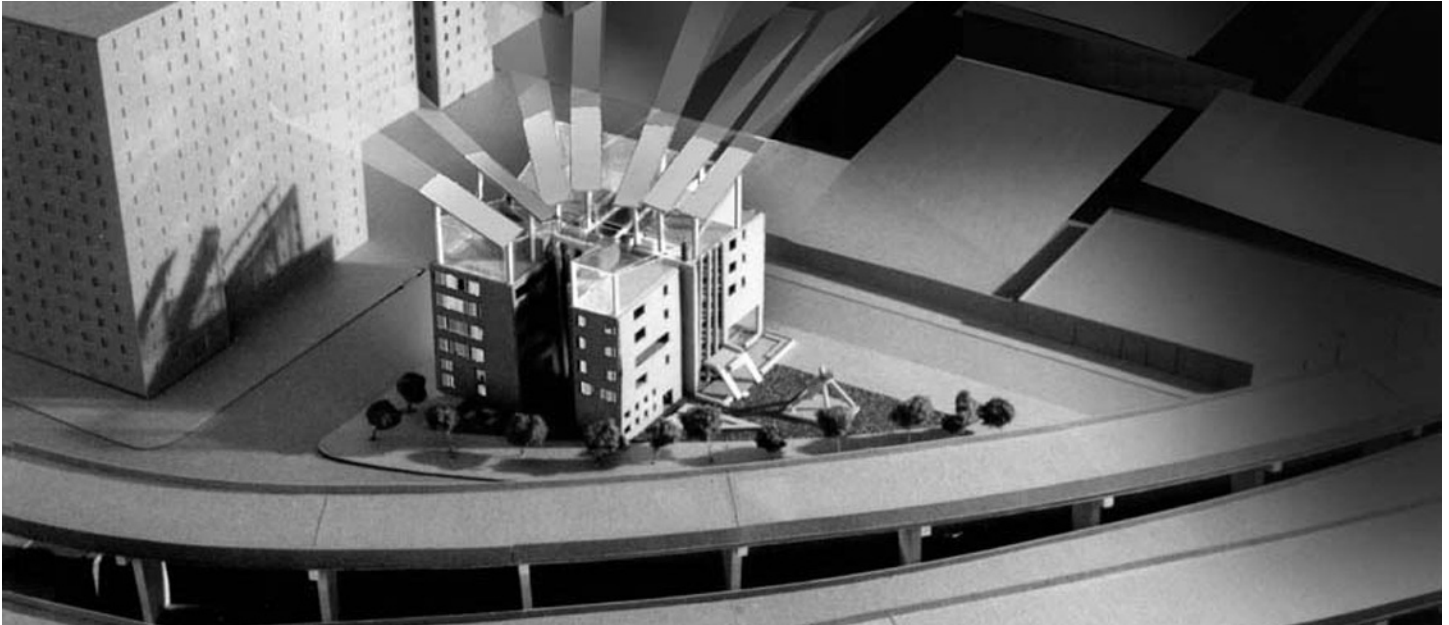


Fig. 5. A crystal roof of photovoltaic cells inflects towards the south and is visible from the Bruckner and Major Deegan Expressways, providing a unique opportunity to advertise Casa del Sol/FUTURE CITY and its agenda.

ment, and so on. Neither residential, nor commercial, nor manufacturing, CTA's proposed hybrid program of artists' workplace, performance space, community center and hostel is allowed "as-of-right" by the City's zoning, despite its current designation within an M1-2 manufacturing zone. Yet the building's original program of 20 apartments is not permitted.

Ironically, we found that the isolation of disciplines within our academic institutions mirrored the compartmentalization of City government, to which CTA owed its survival. For example, our goals conflicted with the division and sequence of curricula within our institutions.<sup>7</sup> Course objectives proscribed for design studios challenged our abilities to expose students to the full range of issues raised by the project. Moreover, direct collaboration between a course and an actual "client" proved problematic to NYIT. A suitable buffer was only offered by working with CCAC, the outreach program of a peer institution. These challenges fostered discussion on commonly held assumptions about the compartmentalization of architectural practice, institutionalized through building codes, zoning regulations and our educational programs.<sup>2</sup>

## PROGRAM AND AGENDA

The realization of FUTURE CITY is conceived to build permanence and continuity within a community lacking institutions. CTA conducts advocacy, outreach, and educational initiatives addressing neighborhood needs.

In addition they support arts and cultural programming as vehicles for community empowerment. Casa del Sol is the base of operations for these activities, and the program they brought to us seemed to be an expansion and elaboration of current functions. Interestingly, it read like a fairly predictable program for a cultural center, crossed with a monastery. Only during the second studio course on project integration, when students queried Rafael Bueno closely about how FUTURE CITY would sustain itself, did critical differences emerge.

The program contains many functions currently accommodated in one way or another by the appropriated space of the existing building: library, workshops, theater and art gallery; common cooking and eating area, or *cantina*; ceremonial space or sanctuary; office space for the organization; living areas for three permanent caretakers and quarters for visiting artists and scholars. During the first studio students expanded many of these functions within currently unusable spaces and by adding onto the building.

CTA had specific ideas that challenged expected notions of security and relationships between public and private space. Functions related to education and work needed to be within or as near as possible to the former ground-floor commercial spaces in order to maximize visibility and access. The organization would locate its own offices within a storefront, and offer space for rent to other groups. CTA also placed great importance on the *cantina*, a special place for food preparation and

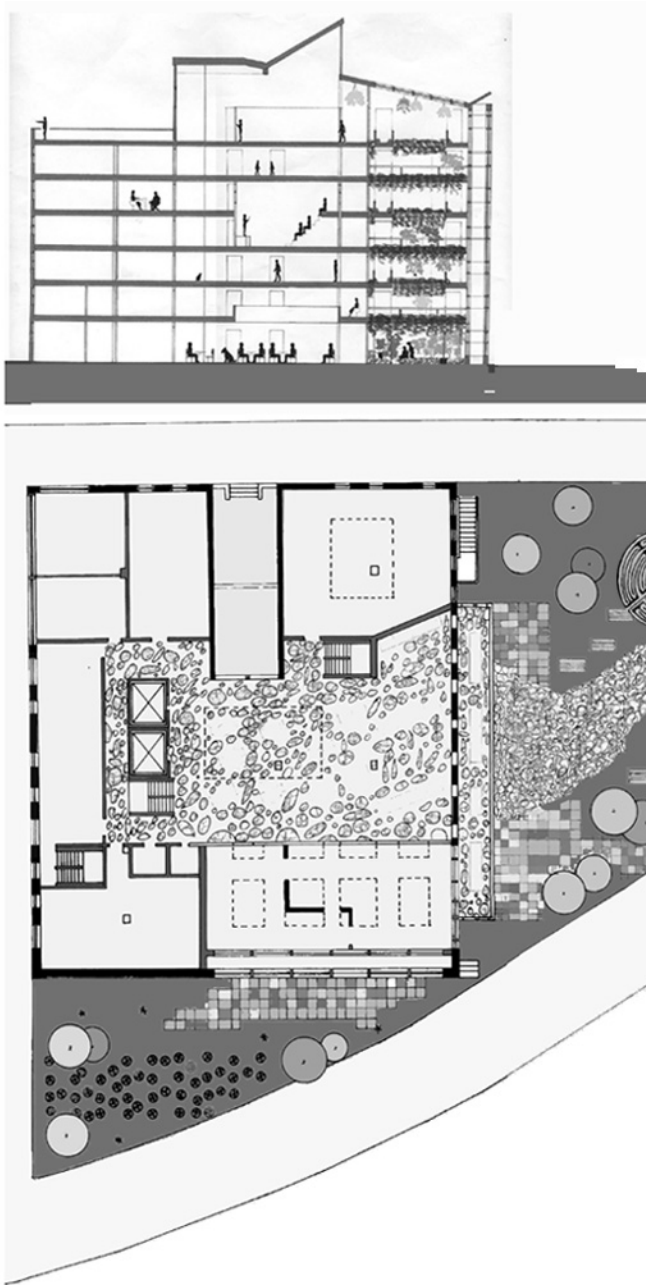


Fig. 6. Student project exploring the idea of the garden as an extension of the social spaces of the interior. Students proposed design solutions and back them up with systems calculations.

communal meals. The cantina required access to the garden for harvesting foods and composting garbage.

The Cherry Tree Garden is an extension of the social space of the interior. In warmer months, an authentic teepee is raised, functioning as a sweat lodge on special occasions.<sup>8</sup> Squash, tomatillos, tomatoes and herbs are shared with residents of the nearby housing projects. The garden also provides a hub of activity in a community sorely lacking in civic infrastructure. CTA volunteers

organize children in projects here and in other community green spaces throughout the neighborhood. In the afternoons, parents wait with young children outside CTA's satellite office a few blocks away for Bueno to walk them to Casa del Sol and open the garden. On festival days, CTA volunteers prepare rice and beans and invite audiences to hear local poets and musicians perform in the outdoor space.

Other elements of the program relate to Cherry Tree's desire to make a declarative statement to the City and the world. Within sight of the Bruckner and Major Deegan Expressways and visible amidst the tangle of roadways leading from the Triborough Bridge, Casa del Sol's location offers a unique opportunity to advertise its own agenda. Bueno conveyed his vision of a "crystal roof" of photovoltaic cells tilted towards the sun, announcing arrival at the "future city" to thousands of motorists each day. Various conceived as a geodesic dome, a prism, or a winter garden, the crystal roof figures prominently in proposals as a visible symbol of the aspirations of Casa del Sol. Under this canopy, CTA envisions greenhouses and communal gathering spaces for dance and worship-expressions of indigenous cultures. Aligned with the objectives of communicating FUTURE CITY's agenda, and taking advantage of its position near the confluence of the East River and Long Island Sound, CTA desires to have a radio station and the means to power it.

## LIVING SYSTEMS

CTA's quest for a sustainable future through advanced technology is not an abstract proposition, but one that presumes accommodation of human aspirations and limitations. FUTURE CITY celebrates this idea through the integration of overlapping technologies and constituencies, recognizing that the workings of the whole are more important than the relative effectiveness of a single system. Throughout the evolution of the project, the team considered combining new, old, and seemingly incompatible technologies to achieve maximum sustainability. Students from cultures that still use cisterns for water storage or masonry mass for retaining temperature brought personal experiences to the mix of ideas. One group proposed that human defecation, processed properly and dried in the basement, could be used to make building bricks. Typical of CTA's openness, Bueno soberly considered this idea.

## THE FUEL CELL

The potential viability of the hydrogen fuel cells is critical to the project in both technologically and socially. CTA plans to employ a solid fuel cell to produce energy on site and on demand. Fuel cells combine hydrogen with oxygen from the air in an electrochemical reaction that produces energy and yields water as a byproduct. Bueno is convinced that this non-polluting energy source would offer empowerment to currently disenfranchised groups. Casa del Sol and other like entities could become micro-energy production sites, independent of fossil fuels and the corporate structures that control them.

The momentary difficulty with fuel cells is that pure hydrogen is not readily available and requires energy to be extracted from its characteristic molecules. In theory, any source of power — fossil fuels, solar, geothermal, wind — can provide the energy for this task. The team explored the possibility of powering solid fuel cells with limited fossil fuels. Other sources of power — methane from garbage dumps or compost — were entertained. Most promising seemed to be the scenario of employing photovoltaic panels to generate the energy needed. The remarkable potential here lies in the possibility of producing hydrogen in a usable form through sustainable methods, that is, without the use of fossil fuels. This would yield a renewable source of energy, competitive with current means, and unleash great potential for economic equity and growth.<sup>9</sup>

CTA will not deploy fuel cells as a stand-alone technology. Other systems, particularly photovoltaics, would be employed to the greatest extent possible, and conservation of energy and other resources remains integral to the program. The fuel cell is thus one component in a constellation of mutually dependant mechanisms for optimizing the use of resources. In this way, the system of multiple components working in concert becomes greater than the sum of parts.<sup>10</sup>

## SOCIAL SYSTEMS

It became clear that the inhabitants of the FUTURE CITY envisioned for Casa del Sol might not live in the same manner that most of us do today. How many showers would residents take? Did they need all the plumbing fixtures prescribed by code, or would they need more? Would everyone who inhabited the center participate in the composting program, or understand and work within the concepts of natural ventilation? What standards of comfort should interior design temperatures follow? With what degree of security and privacy would

inhabitants be afforded? The details, explored in meetings with Rafael Bueno and Lisa Westberg, raised questions about the assumptions embedded in building codes and the standards we, as architects, apply to programming for design.

The intertwining of technology with the daily operations of CTA inspired students to offer unconventional propositions that highlighted this connection. One team proposed running waste and storm water, en route to a basement processing plant, in transparent tubes. Others suggested capturing body heat from communal spaces as energy for powering building systems, or designed galleria and atrium spaces that would circulate and purify the air and produce hydroponically grown food. To Cherry Tree, these notions are not far-fetched, as the members are committed to realizing the project with this level of ambition as a demonstration to the community at large, despite apparent inefficiencies.

CTA incorporates both “lay” and professional help in the same way, making room for so-called “inefficient” technologies. It was particularly important that students explore their prescribed role as citizens and youthful professionals and become empowered to produce possible solutions for a sustainable future. While the semesters’ work was rigidly organized, the production of architectural ideas was freewheeling. The emphasis on collaborative and collective effort involving different generations and levels of expertise substitutes a new measure of efficiency based on the sustainability of human habitation on the earth over output per unit of capital or labor.

## LIVING MACHINES

One of the most powerful metaphors for the CTA enterprise grew out of research on alternative environmental systems. Students proposed a Living Machine, a natural water purification method to conserve and purify water within the territory of the site.<sup>11</sup> To understand the Living Machine as merely a water purification device is to miss its greater significance. Like farming or any organic system, Living Machines require constant maintenance and attention to function safely and healthfully. And like the microcosm of our FUTURE CITY, they can only exist within a nexus of appropriate social, political, economic and physical circumstances.

Consideration of this model offered a novel and systemic understanding of design as a complex, process-oriented relationship. The workings of people who will

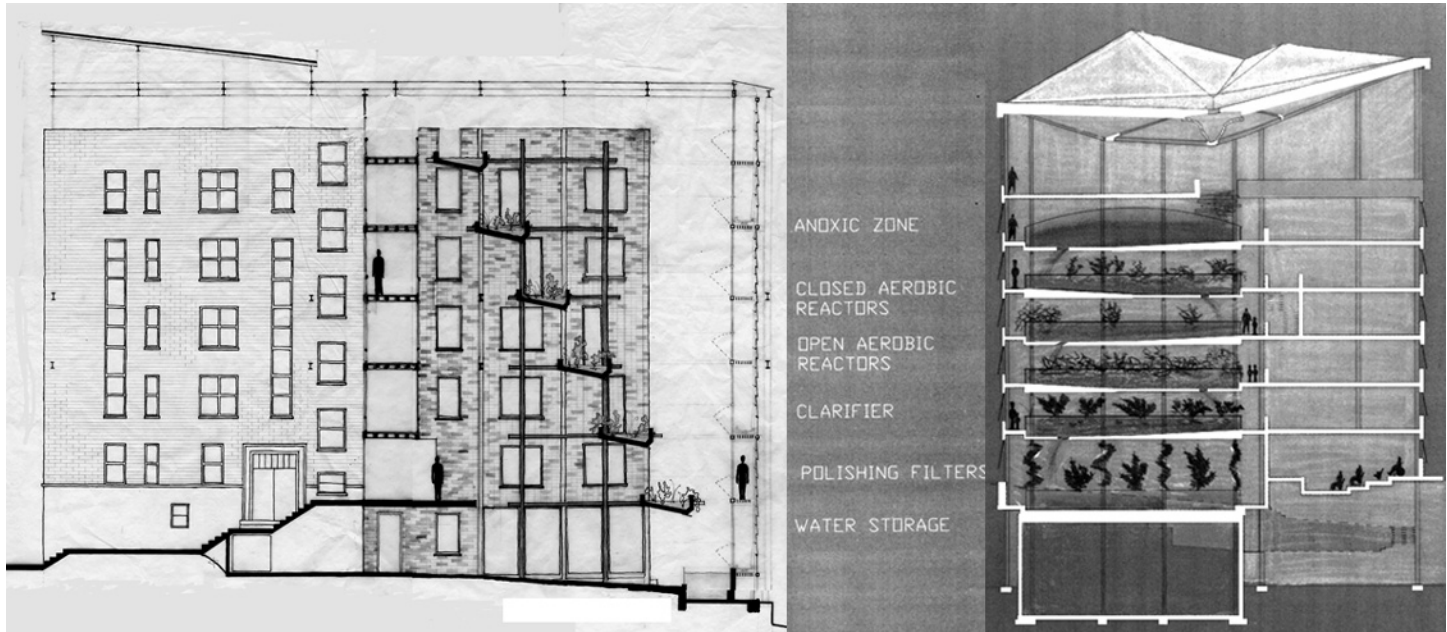


Fig. 7. Two versions of the Living Machine proposed for the courtyard of Casa del Sol. A living Machine, a natural purification method re-invented by Dr. John Todd was proposed to conserve and purify water within the territory of the site. Left: Students propose a double layered habitable skin of insulating glass to protect Casa del Sol while allowing its original masonry façade to remain. Inside, the courtyard between the two wings of the existing building contains a cascading living machine. Right: Students propose a Living Machine that purifies rainwater collected at the roof and stores it in the cistern below the building.<sup>16</sup>

inhabit and, day by day, constitute the project of the Living Machine, or of Casa del Sol for that matter, are integral parts of the system loosed by the design. Cherry Tree's agenda to "reestablish harmony between people and nature" challenged us to extend our understanding of the "environment" to the complex organism of the living city, thereby imbricating the artifact of the metropolis within the quest to live more harmoniously on the earth. Likewise, CTA learned the power of their example, in seeing their challenges expressed through precedents like the Living Machine and in new arrangements proposed by the students.

#### TRANSFORMING ACADEMIC PARADIGMS:

##### Closing distance: Being there

For the teams of students, becoming part of the daily workings at Casa del Sol demolished preconceptions and spurred imaginations more effectively than any curricular "re-mapping." Writing about commuters who sped through the South Bronx in the early 1990's, Marshall Berman states, "One thing we can learn from history is that most of the terrible things that groups of people do to other people are done at a distance."<sup>12</sup> Distance was not possible here, as the project of FUTURE CITY builds on an actual, functioning institution. Lisa Westberg, Rafael Bueno and the others we met were already living and experimenting with pro-

gram, site and context, and provided the students with a sounding board for exploring their ideas.

##### When "All that is solid melts into air"

The most valuable lessons learned during two semesters of study related to preconceptions about creativity and progress. As the project did not propose an entirely new structure, but rather additions to and transformations of an existing one, design propositions had to be made within the context of a preexisting order of things: structure, partitions, water and waste lines, sunlight and neighborhood. This approach is unorthodox within the curriculum taught in most architectural programs, particularly in the design studio sequence. To a great extent, modernist precepts still dominate our training, ideas conceived to control society during peace or rebuild after war and allied with capital seeking quick return. Our society, our education, invariably privileges new buildings planned with minimal referents to preexisting contexts.<sup>13</sup>

Berman, who spent his childhood on East 170th Street two miles north of Casa del Sol, compares the devastation of the South Bronx in the 1970s to the ruins of war. He describes the consequences of hacking apart neighborhoods with highways and destroying communities through strategic disinvestment as "urbicide".<sup>12</sup> Yet, he recognizes the inevitability of such destruction under an economic system that must destroy itself to create,



reinventing “worlds” within the space of a generation in order to sustain this ethos of constant renewal.<sup>14</sup>

In proposing the model for the “future city” within the shell of a Bronx apartment building, CTA provides an alternative to this notion of progress; presaging that when “all that is solid melts into air,” as Marx optimistically predicted (as quoted by Berman), “men are forced to face... the real conditions of their lives and their relations with their fellow men.”<sup>15</sup> Immersed in the circumstance of Casa del Sol, the idea of “existing conditions” became immediate and tangible. Most students eventually recognized how the history-laden masonry structure offered a poignant foil to their proposed additions and changes, an opportunity for rich juxtapositions of materials and scales and a compression of the building’s many lives into the present moment. Students gained a gradual understanding that a creative response need not destroy and replace entire worlds to have a powerful effect; rather that sensitivity to existing conditions and careful editing can provide inspiration.

Cherry Tree embraces the challenge that in the early 21st century we must work together to create the conditions of our world, even, in effect, to produce our natural environment. CTA’s agenda for Casa del Sol/FUTURE CITY is nothing less than a radical revision of long inappropriate and taken-for-granted aspects of human behavior. It will create a site-specific laboratory that, drawing from its social, political and physical context, reconstitutes an ecology within which a more desirable human culture can flourish. Far from a utopian or naïve endeavor, Casa del Sol/FUTURE CITY has been strategically planned by the CTA to turn supposed disadvantages into powerful means for triumph. Through its workings, this microcosm engenders an integral, tangible aesthetic, something that touches us and speaks to the way human beings interact with one another and with the earth. What better means to start to implement this goal than with the young people who must enact the future?

## NOTES:

<sup>1</sup> Our multi-disciplinary participants:

The Cherry Tree Association, Inc.:

Rafael Bueno, Executive Director; Lisa Westberg, Development Director; Luis Cerveso, President.

City College Architectural Center, The City College of New York

Ethan Cohen, Director; Student interns: Maria Karantzalis, Burak Kasapaglu, Marco Williamson.

New York Institute of Technology School of Architecture and Design

Michele Bertomen, Associate Professor; Student participants: (Design 6) Thomas Blore, Eric Cibelli, Natacha Dartois, Krystal Forde,

Jacob Rivalsi, Angela Schill, Michael Sciara, Tyrone Sergeant (Project Integration): Luke Ferran, Michael Maher III, Jonathan Nicholson, Elizabeth Moreno, Denise Ortega, Kevin Phillips, Enis Piskener, Malcolm Powell, Sean Reed, Pamela Rice, Michael Saracco, Ronald Villano, Katherine Zaneski.

Alumni of NYIT School of Architecture and Design:

Lisa Iulo, Assistant Professor, alumni; Rowan Georges, Assistant Professor, alumni;

Robert Garcia, alumni; Robert Papocchia, alumni

Extended “Design Team”

Allied community groups:

Casa Atabex Ache; Citizens Advice Bureau; Freedom Community Center; Green Map Systems; United Confederation of Taino People

Professional support:

Brooklyn Architects Collective; Sam Haffey, Architect; Steven Winter Associates, Bill Bobenhausen; Solar Energy Systems, David Buckner; Alternative Power, Anthony Pereira; Greenstreet Environmental Construction, Robert Politzer.

<sup>2</sup> In June of 2001, CTA hosted a public forum, *The Future of Cities: The Role of Institutions in the 21st Century*, in conjunction with the exhibition *Casa del Sol / FUTURE CITY* at Casa del Sol’s Adverse Possession Gallery. Michele Bertomen, NYIT and Ethan Cohen, CCAC coordinated the event. Panel Respondents: Bill Aguado, Executive Director, The Bronx Council on the Arts; Andrew Darrell, Regional Director, Environmental Defense; Nicolas Rojas, Director of Programs and Special Projects, Urban Center Books, a project of the Municipal Arts Society; Michael Sorkin, Director Graduate Program in Urban Design, CCNY; Chris Sharples, Principal, Shop Architects; and Mark Strauss, Principal, Fox and Fowle Architects P.C..

<sup>3</sup> Richard Plunz, *A History of Housing in New York City* (Columbia University Press, 1990) pp.130-132. R. Plunz refers to the housing type of this era, located in the Bronx as the “Peoples Palazzo.”

<sup>4</sup> Jill Jonnes, *South Bronx Rising: The Rise, Fall and Resurrection of an American City* (Fordham University Press, New York, 2002) pp. 116-126.

<sup>5</sup> When it appeared that the City might try to bundle the property with the adjacent community garden in a sale to private developers, CTA maneuvered to keep the block intact by having the garden preserved for community use. In 1999, the Trust for Public Land purchased the Cherry Tree Garden, from which the organization takes its name. CTA has since petitioned the Department of Housing Preservation and Development to clear title on the property and transfer it to the Department of Cultural Affairs (DCA), with the hope that DCA would then sell or lease them the building for redevelopment as a community cultural institution. Trust for Public Land: <http://www.tpl.org>.

<sup>6</sup> The boiler ceased venting properly after the construction of the highway and surrounding towers. Bueno feels that this is why the tenants refused to pay rent, “they did not have heat”. This factor, along with rising oil prices in the 80’s, led to their clash with authorities and eventual eviction.

<sup>7</sup> The organization of the curriculum of schools of architecture by and large emulates the organization of architectural practice and related professions. In this model, the design studio is given the most time attention and credit. It is a recognized problem that “support” courses like history, mechanical and structural engineering, building systems and construction fit in around the design sequence rather than becoming integral to it.

<sup>8</sup> The teepee was purchased from the Lakota, also known as the Sioux.

<sup>9</sup> With this analysis, CTA agrees with a number of proponents of a hydrogen economy. See: Jeremy Rifkin, *The Hydrogen Economy: The Creation of the World Wide Energy Web and the Redistribution of Power on Earth* (Tarcher Putnam, 2002) and Jeremy Rifkin, “Hydrogen: Empowering the People”, *The Nation*, December 23, 2003.

<sup>10</sup> As this paper was developed a firm called H-Power based in New Jersey and holding a patent for fuel cell technology suitable for



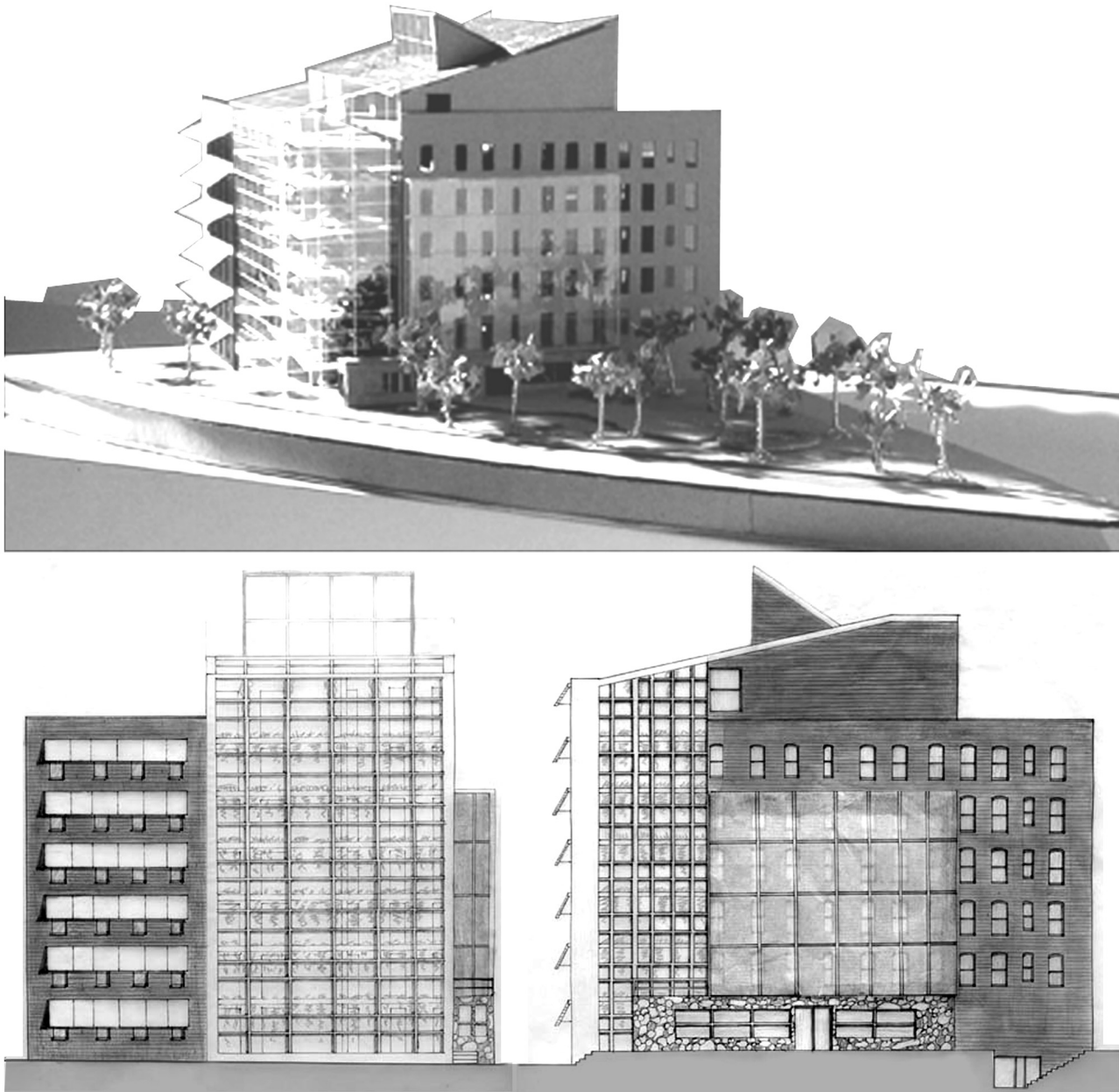


Fig. 8. Students proposed common spaces from worship to dance to cantina as the central fuel for human energy powering building technology. Green galleria spaces purify air, produce hydroponic grown food and extend the garden far into the interior of the building.

mass production merged with the well financed Plug-Power (Schedady, New York).

<sup>11</sup> Reinvented and refined for the 20th and 21st centuries by Dr. John Todd at his New Alchemy and related New Arks Institutes, Living Machines use "the ecologies of naturally occurring wetlands [to] form the base of a sustainable system for water treatment." Water is directed through a series of closed and open tanks, each carefully planted with appropriate flora or fauna (bacteria living in anaerobic conditions) to remove microorganisms that are harmful to humans in a series of calibrated steps. Swamp plants can even remove some heavy metals in a chemical process occurring naturally within their hollow stems. Living Machines are effectively deployed in 80 locations around the world. See <http://www.oceanarks.org> for

current information on Dr. John Todd's Living Machines. Retrieved March 1, 2003.

<sup>12</sup> Marshall Berman, "Falling Towers: City Life after Urbicide", *Geography and Identity*, ed. David Crow, Washington, D.C.: Maison Neuve, 1996.

<sup>13</sup> For instance, Le Corbusier's *Ville Radieuse* and *Islet Insalubre* projects. Also note the proliferation of identical franchise outlets irrespective of context.

<sup>14</sup> This paragraph paraphrases Rafael Bueno's unpublished text: "Casa del Sol Future City: Prometheus unbound in the South Bronx." The text uses the myth of Prometheus as re-explored by the Dominican poet and activist Paul Lafargue (1842-1895) to illuminate aspects of our contemporary struggle for energy rights. Thoughts in this essay

were communicated to students and faculty, anecdotally during reviews and site visits by various members of Cherry Tree Association.

<sup>15</sup> Marshall Berman, *All That Is Solid Melts Into Air: The Experience of Modernity* (New York, Penguin USA Inc., 1982.) This is a quote used by Berman from Karl Marx *The Communist Manifesto* see page 21.

<sup>16</sup> Illustration # 7 is from two teams: Left is Solar Garden: Pam Rice, Enis Piskener, Michael Maher III and Katherine Zaneski. Right is Ecosynthesis: Denise Ortega, Malcolm Powell and Kevin Phillips.