AUTOMATION + ANXIETY | ARTIFICIAL INTELLIGENCE, ROBOTICS, LABOR, AND ENVIRONMENT

Advanced Studio 4
Columbia University Graduate School of Architecture, Planning and Preservation
Critic: David Benjamin

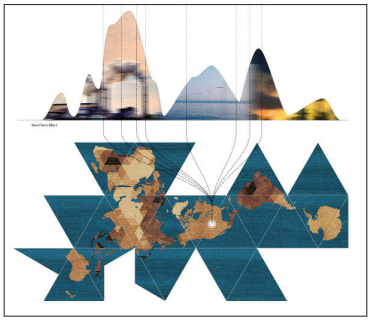
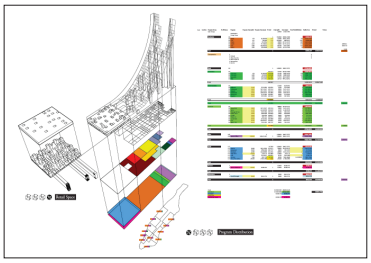
OVERVIEW

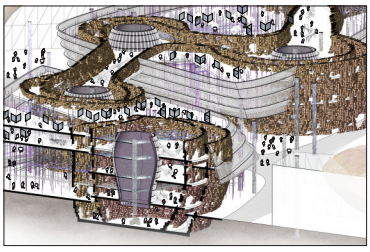
In May of 1997, the world's best human chess player, Garry Kasparov, sat down to play the world's best computer, IBM's Deep Blue. Ten years before, Kasparov had boasted, "No computer can ever beat me." But the recent progress of computation seemed impressive and potentially game-changing. In the lead-up to the competition, the battle had been dubbed Ali-Frazier.

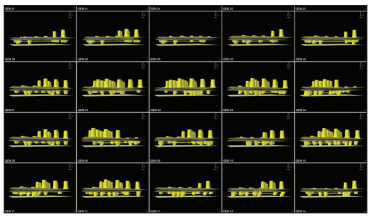
Near the end of the first game, in the forty-fourth move, Deep Blue a made highly unusual play, sacrificing a rook while ahead, which seemed to hint at a sophisticated strategy of preventing countermoves. Kasparov was rattled. He could not comprehend why the computer made the move, and he feared that it demonstrated a superior intelligence. The game ended in a draw, but at the beginning of the next game, Kasparov made an unprecedented error, and Deep Blue went on to win the epic battle. According to a report in Wired Magazine, "The chess world found it devastating. 'It was too much to bear,' said grandmaster Yasser Seirawan. The cover of Inside Chess magazine read 'ARMAGEDDON!'"

In 2012, long after computers asserted their dominance in chess, one of the inventors of Deep Blue revealed that the fateful forty-fourth move had been due to a software bug. According to writer Nate Silver, "Unable to select a move, the program had defaulted to a last-resort fail-safe in which it picked a play completely at random… Kasparov had concluded that the counterintuitive play must be a sign of superior intelligence. He had never considered that it was simply a bug." In the end, the computer won not because of an innovative strategy, but because the human was prone to worry and doubt and self-destruction. The human assumed that machine intelligence worked like human intelligence—and therefore the unusual move must have been a rational strategy. But the computer had a different intelligence altogether, one that was subject to bugs but not subject to weariness or worry. Neurologist Robert Burton elaborates, "The ultimate value added of human thought will lie in our ability to contemplate the non-quantifiable… Machines cannot and will not be able to tell us the best immigration policies, whether or not to proceed with gene therapy, or whether or not gun control is in our best interest." In other words, since machines cannot worry, and since worry and doubt are productive in creating humanistic, fair solutions to the problems of our time, humans will never be replaced by machines.

Yet in 2016, almost 20 years after the fateful computer victory in chess, Google's DeepMind defeated a human champion at the game Go, which was once considered a game for uniquely human intelligence. It was thought that Go was impossible for a machine to win due to the nearly infinite number of outcomes and the difficulty of calculating which player is leading at any given moment. Google's computer used a new version of artificial intelligence called machine learning, and this new victory may signal what Maksim Podolyak, a vice-president of the Russian Go Federation, refers to as the birth of a "new age—an age of computers able to resolve specifically humanistic problems." Machine learning is now being applied for financial trading, advertising, language translation, malware detection, computer vision, and countless other applications. And because of





Images (top to bottom): Factory design and visualization (Benjamin Studio 4, Abraham Murrell and Edward Palka); Global production diagram (Benjamin Studio 4, Ruomeng Wang); Generative design program diagram (Benjamin Studio 4, Troy Therrien); Community center and participatory construction (Benjamin Studio 5, Lorenzo Villaggi); Production from waste (Benjamin Studio 4, Troy Lacombe); Physical model of materials designed to change over time (Benjamin Studio 4, Tonia Chi); Generative design to explore mixed-use building (Benjamin Studio 5, John Locke).

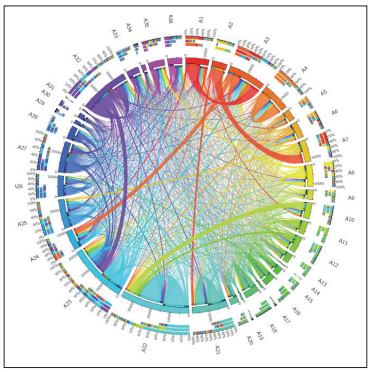
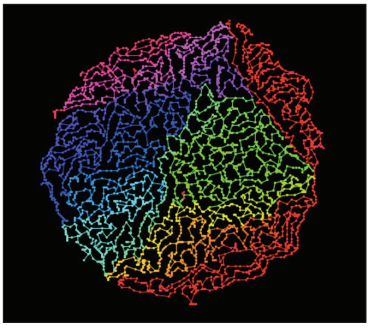
its quiet ubiquity, this brings up questions about its use as well as its effectiveness. As with all technologies, machine learning involves assumptions and biases. But the biases of machine learning may be even more troubling than other biases because they are hidden, sometimes even hidden from their own inventors. This concept has been articulated by recent writing including Cathy O'Neil's "Weapons of Math Destruction" and Kate Crawford's "Artificial Intelligence's White Guy Problem." O'Neil and Crawford show how the biases of these algorithms can lead to racial profiling in policing, sexism in job listings, and uneven distribution of resources in urban neighborhoods. And their arguments imply that understanding algorithms requires understanding the humans who create them, the humans who are displaced by them, and the humans who are affected by their conclusions.

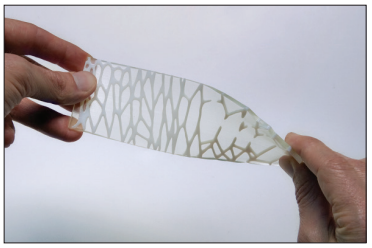
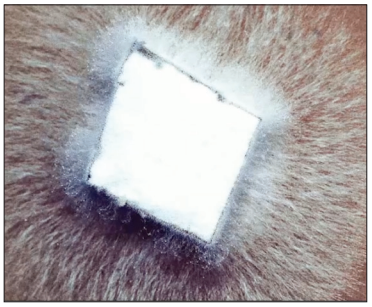
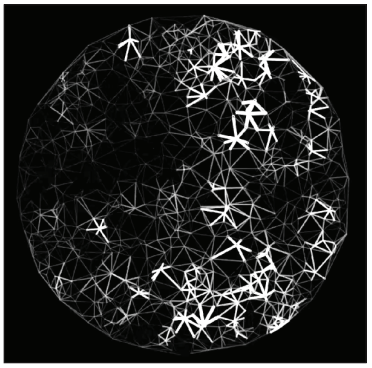
Perhaps the battles of chess and Go—and the growth of machine intelligence that they represent—suggest that it is important to become more fluent in algorithms. It is important to understand what's going on under the hood—including the bugs they contain, the data they are based on, and the rules that lead to their conclusions. This is crucial not just to be able to use the algorithms effectively, but also be able to guide, temper, and respond to their use. In other words, this is a political issue as well as a technical issue. And "automatic" should be a question rather than a conclusion.

The ongoing story of humans and machines is a fascinating case study of technology in the 21st Century, and it sets the stage for Automation + Anxiety: an architecture studio that engages technology, environment, buildings, infrastructure, landscapes, ecosystems, numbers, images, stories, values, trade-offs, nature, and climate change. The studio will combine technology with environment. It will explore the latest generation of algorithms, robots, and artificial intelligence—and it will interrogate several emerging frameworks related to themes of environment and technology, including the Circular Economy, Antifragility, and Hyper Nature. The studio will also examine a range of design approaches, including multi-scalar design, new materials, and new software techniques. Within this context, the studio will work on architecture for education, energy, labor, and water bodies. Over the course of the semester, we will generate proposals that are both quantitative and qualitative. We will produce metrics, narratives, and images. We will design rules rather than fixed forms. We will anticipate rapid change. And we will welcome shifting forces, unknowable crises, and uncertainty.

THE CIRCULAR ECONOMY

The Circular Economy is an emerging concept for a new era of design across multiple industries. This concept is based on creating ecosystems with two types of nutrients: biological nutrients that are designed to circulate without unhealthy waste products, and technical nutrients that are designed to circulate at high quality without material impact. The Circular Economy promotes renewable energy and materials with low embodied energy, but it also involves a broader range of open source scientific projects and solutions that are healthy in terms of environment, finance, and society. A recent report by the World Economic Forum explains, "In a world of close to 9 billion—including 3 billion new middle-class consumers—the challenges of expanding supply to meet future demand are unprecedented. Our current 'take-make-dispose' approach results in massive waste, and in the fast-moving consumer goods sector about 80% of its $3.2 trillion value is lost irrecoverably each year. The switch from a linear to a

Images (top to bottom): Diagram of Circular Economy in Portugal (via MM & Random Thought); Data visualization of bacterial colony growth (Columbia Advanced Data Visualization Project, Danil Nagy, Lars Dietrich, David Benjamin); Pre-Circular Economy Global Supply Chain; Multi-material 3D print of new composite sheet (Bio Computation, The Living); Mycelium growth (Ecovative Design); Data visualization of animated hair (Columbia Advanced Data Visualization Project, Danil Nagy, Eitan Grinspun, David Benjamin).

regenerative circular economy provides credible and quantified perspectives to address this generational challenge. Ultimately the circular economy could decouple economic growth from resource consumption—truly a step-change." In this context, could we similarly aim to decouple building construction from resource consumption? How might we design buildings, landscapes, and cities as part of regenerative circular economies? Should the domain of architecture expand over space and time to incorporate global supply chains and recycling/composting of construction material? How should agency and responsibility be shared in this context? What are the social, political, and economic levers that designers might pull?

ANTI-FRAGILITY

In the context of climate change, resilient systems have become appealing as a model for design with shifting forces, unknowable crises, and uncertainty. In response to extreme weather such as Hurricane Sandy, multiple parties—including politicians, community groups, environmental activists, urban planners, architects, engineers, and the general public—are seriously considering resilient design as a strategy for rebuilding and resisting future damage. Yet some people argue that resilient systems are not enough. While resilient systems are defined as recovering quickly from stress, "antifragile" systems are defined as thriving and improving under stress. Nassim Nicholas Taleb, who developed the concept, states: "Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better. This property is behind everything that has changed with time: evolution, culture, ideas, revolutions, political systems, technological innovation, cultural and economic success, corporate survival, good recipes . . . the rise of cities, cultures, legal systems, equatorial forests, bacterial resistance . . . even our own existence as a species on this planet." But is the concept of antifragility useful for architecture? Is it possible to design antifragile buildings, landscapes, and cities? How might we design with inherently dynamic ecological processes? How might our design strategies incorporate risk and change?

HYPER NATURE

If the Twentieth Century was the Century of Physics, then the Twenty-First Century is the Century of Biology. Biological technologies are advancing exponentially. In the past ten years, it has become possible observe living systems in new ways through high-resolution imagery, to create computer models of biological cells, to cut and paste DNA, and to combine biological functions such as growth, movement, sensing, deposition, regeneration, and self-healing into new organisms that never existed in nature. These developments allow us to imagine and design a new form of nature—a hyper nature. This concept of nature blurs old distinctions between the artificial and the natural. It involves biology, the environment, engineering, computation, and the problems and technologies of our times. But this concept is not limited to the technical realm. According to the publication Next Nature, "Hyper nature is culture in disguise." So what is new about the concept of hyper nature, and what is simply a rebranding of well-worn ideas? What is the architecture of hyper nature? Can we harness biology for design without fetishizing it? Is it possible to "collaborate" with natural systems and derive hypernatural designs that humans alone—or nature alone—could never create?

SCALE AND ENVIRONMENT

The studio will operate at multiple scales simultaneously. Over the course of the semester, we will rethink materials, buildings, site plans, and infrastructures. We will

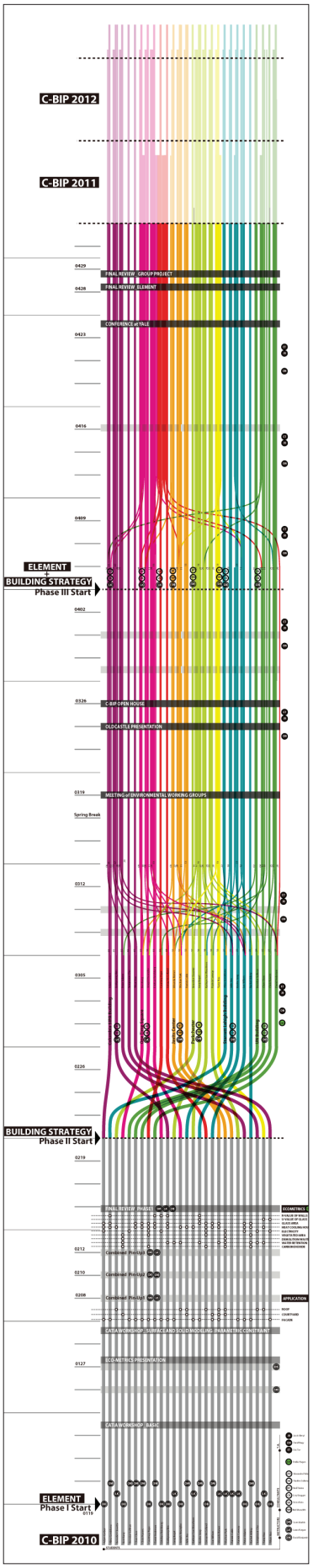


Image: Collaboration diagram (Benjamin Studio 4, Muchan Park).

look at new multi-scalar paradigms that include robust biological and social dynamics, energy generation, and adaptability. We will explore design from the scale of material composition, including molecules with a diameter of about 10^-9 meters, to the scale of global production, including the earth with a diameter of about 10^7 meters—16 powers of ten in the same studio.

ENERGY AND LABOR

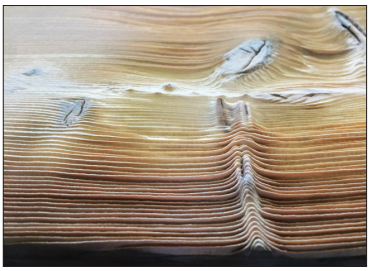
The studio will explore architecture, environment, and technology through the interrelated lenses of energy and labor. It is well known that buildings are major contributors to climate change (about one-third of the world's solid waste, energy consumption, and carbon emissions come from architecture). And energy is fundamentally related to materials as well as systems. (In the past fifty years, operational energy—defined as the energy for things like heating, cooling, and lighting—has in fact declined as a percentage of total energy consumption in buildings. At the same time, embodied energy—typically defined as the sum of all energy required to extract raw materials, and then produce, transport, and assemble the materials of a building—has rapidly increased.)

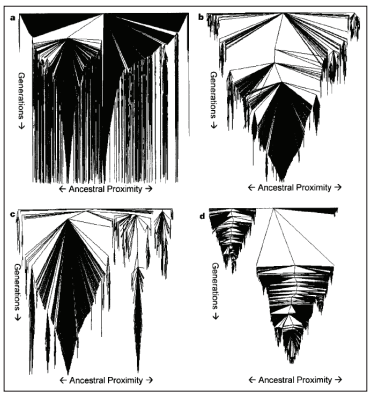
But energy is also fundamentally related to labor. In 1973, a young Swiss architect named Walter Stahel was looking for ways to save large amounts of energy in the construction industry. Instead of looking at technologies such as more efficient lighting or cooling, Stahel turned to behavior patterns and socioeconomic issues. Stahel and his collaborator, Genevieve Reday-Mulvey, eventually reached the conclusion that these problems could be best addressed by substituting manpower for energy. In a report called Jobs for Tomorrow, they wrote, "The creation of new skilled jobs can be achieved in parallel with a considerable reduction of the energy consumption through a prolongation of the useful like of materials and products." Stahel and Reday-Mulvey's line of thinking itself was not new. All accounts of industrialization involve the increase in productivity due to machines taking over the labor of humans, which translates to machines consuming energy (usually fossil fuel) to do work instead of humans consuming food to do work. But it was refreshing for Stahel and Reday-Mulvey to suggest that this trend could be selectively reversed through having humans take back some work from machines.

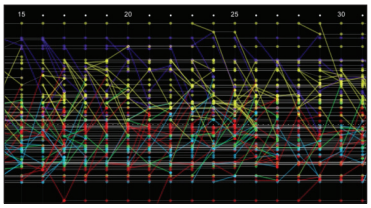
Of course much has changed since 1973, but Stahel and Reday-Mulvey's original argument about the need to look simultaneously at fossil fuel consumption and fulfilling employment is as relevant as ever—especially in light of the current wave of anti-globalization populism in Europe and the United States. Labor and environment should not be considered separate agendas. This studio will consider how architects might design jobs, machines, and materials as well as buildings, energy, and environmental impact. It will explore how labor and equality are necessary factors when considering urgent environmental issues.

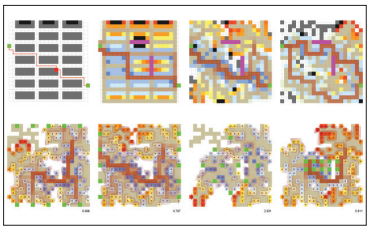
PHYSICAL EXPERIMENTS: NEW MATERIALS, A.I., AND ROBOTICS

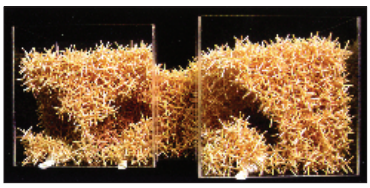
This is a hands-on studio, and we will apply our concepts to physical and digital designs and prototypes. Our physical experiments will combine our thinking about embodied energy, raw materials, re-use, and waste with old and new technologies for making. More specifically, this studio will work with physical automation through a new "friendly robot" at GSAPP that points to a new era of human-machine collaboration. Students will develop systems to use robotics not just for top-down precision fabrication, but also











Images (top to bottom): Material ecologies (Neri Oxman, MIT Media Lab); Robotic processing of salvaged New York City scaffolding boards (Princeton Laboratory for Embodied Computation, by The Living); Evolutionary computation through generative design (Hod Lipson, Creative Machines Lab, Columbia University); Visualization of design space of 10,000 designs (The Living); Using generative design for program layout and robotic circulation (Benjamin Studio 5; Thomas Wegener).

for bottom-up feedback-based assembly. We will learn to program the Universal Robots UR3 and design systems for processing and constructing prototypes with salvaged materials. We will program the robot with rules rather than forms. We will rely on the robot's sensors to capture real-time information, and we will experiment with its ability to adapt and learn over time as a new form of artificial intelligence. We will create novel design ecosystems that combine high-tech and low-tech, digital and physical, control and emergence. We will engage advanced robotics as well as messy found materials. We will explore the next generation of robotics in architecture, as it tackles complexity, feedback, and machine learning. And at the same time, we will engage a return to craft and multi-material physical prototypes.

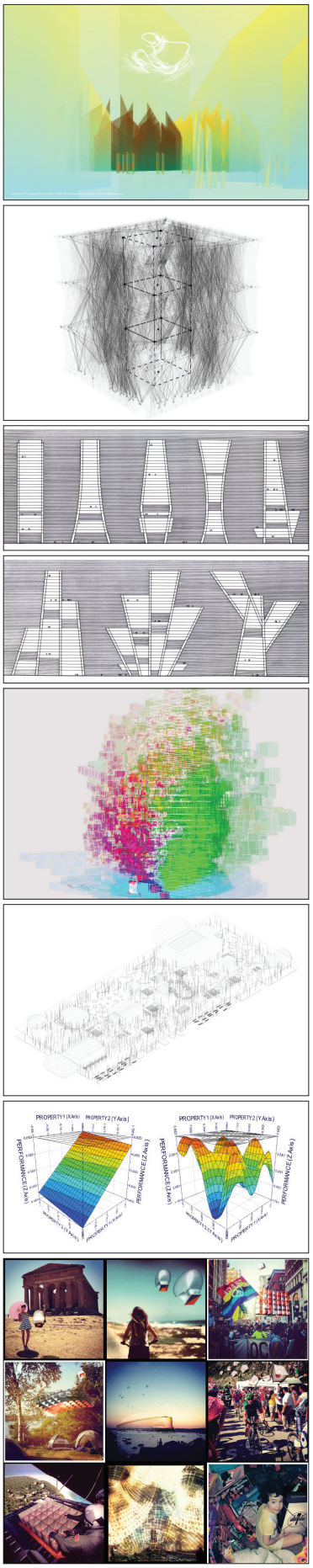
DIGITAL EXPERIMENTS: NEW SOFTWARE AND GENERATIVE DESIGN

Our digital experiments will build off of our physical experiments and explore the emerging framework of generative design. This framework relies on recent advances in cloud computing, digital simulation, and data science. It involves designing goals and constraints (as opposed to designing formal solutions), and using automation to generate, evaluate, and evolve thousands or tens of thousands of designs. With this framework, we will use software to investigate data, to explore a very wide potential design space, to minimize our preconceptions, to avoid relying on old rules of thumb, to derive unexpected high-performing results, and to negotiate between competing architectural values. For our purposes, computation and optimization will not be about achieving cold-blooded efficiency—but rather it will be about enhancing our creativity. It will be about discovering possibilities that a human alone—or a computer alone—could never produce. Yet while this studio will explore new frontiers of design and computing, no prior experience with software is necessary.

METRICS + NARRATIVES + IMAGES

Metrics are inextricably related to climate change and our understanding of the natural environment. They are also entwined with almost everything about our current world. Metrics drive public health, personal health, election polling, global supply chains, search engines, social networks, and computer simulations of everything from airplane flights to hurricane paths to crowd behavior. Writers Michael Blastland and Andrew Dilnot declare, "For good or ill, numbers are today's preeminent public language—and those who speak it rule." But while numbers are more available and more important than ever, in many ways our understanding and use of them is confused and unimaginative.

In this studio, we will consider how architecture might be defined by an ecology of numbers—an ebb and flood of input numbers and output numbers. But we will also explore aspects of architecture and the environment that are difficult to quantify. We will engage theory, culture, and aesthetics. We will recognize that dealing with complex and urgent issues requires qualitative approaches as well as quantitative approaches. In a recent New York Times essay called "Are We Missing the Big Picture on Climate Change?" Rebecca Solnit explores the complexity of ecosystems, and she argues, "Addressing climate [change] means fixing the way we produce energy. But maybe it also means addressing the problems with the way we produce stories." As architects, we might add that addressing climate change means addressing problems with the way we produce images. With this in mind, our studio will explore a nuanced combination of designing with metrics, designing with narratives, and designing with images.



Images (top to bottom): Metric drawing (Benjamin Studio 4, Lindsey Wikstrom); Metric drawing (Benjamin Studio 5, Nathan Smith); Tower typologies; Generative design options (Benjamin Studio 5, Nathan Smith); Flexible space for education on Governors Island (Benjamin Studio 4, Xiaoyu Wang); Response surface as visualization of complexity of design space (The Living); Decentralized, self-organizing living pods for adaptive architecture (Benjamin Studio 5, Ray Wang and Jim Stoddart).

EDUCATION + JOBS + AUTOMATION

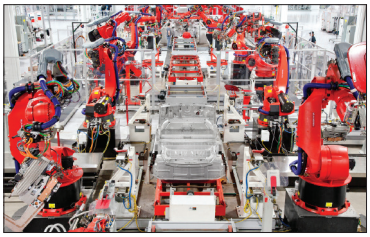
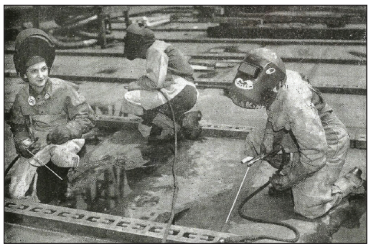
Automation involves more than technology. It is clearly affecting economics and employment. Many economists have noted that the loss of jobs in the Midwestern United States—clearly a major factor in the 2016 United States Presidential election—was caused more by automation than by trade deals. The same robots and algorithms that are exciting for designers can be devastating for workers who are displaced by them. But perhaps energy offers a clue to a new direction. According to a recent report by the U.S. Department of Labor, wind-farm technician is projected to be the fastest-growing occupation in America over the next decade.

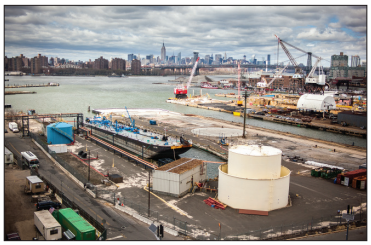
This studio will address climate change through the architecture of education, energy, labor, and water bodies. Students will design a new mixed-use building for education and job training in the Brooklyn Navy Yard. The Navy Yard is currently playing out a complex and ambitious private-public partnership that aims to become a hub for entrepreneurship and to bring manufacturing back to New York City. The Navy Yard is also one of the waterfront sites in the city that is most susceptible to the rising sea levels and flooding that will come with climate change. In a sense, this site is ground zero for a new integration of technology and environment. Yet this is also a contested site, and our job training center will address the friction between the advancement of the people who program robots and the transformation of the people who have been upended by them.

This friction reminds us that "sustainability" has to be framed in social as well as environmental terms. As Jodi Dean has recently put it, "Just as a class politics without ecology can support extractivism, so can an ecology without class struggle continue the assault on working people that has resulted in deindustrialization in parts of the North and West and hyperindustrialization in parts of the South and East (we might call such an ecology without class struggle 'green neoliberalism')."

In this studio, we will engage both a new form of technical education and an expanded waterfront as classroom. We will engage both the traditional campus and an expanded city as campus. We will think about the future, and design for the present, encompassing new models of environment and technology into our projects, and producing visionary and viable buildings.



Images (top to bottom): Brooklyn Navy Yard; Same; Tesla factory with reconfigurable robots; Labor in Brooklyn Navy Yard; Future food building in Brooklyn Navy Yard; Brooklyn Navy Yard; Fly By Night art performance in Brooklyn Navy Yard; Same.

Columbia University
Graduate School of Architecture, Planning and Preservation
A4104-2: Advanced Studio IV, Spring 2018, Critic: Adam Frampton (asf@only-if.org)

Bridgeport Thinkbelt

Advanced Studio IV focuses on the question of architecture beyond its own envelope, and the possibility for engagement with larger territories and environments. Urbanism introduces the possibility of uncertainty rather than stability, and a focus on systems rather than objects. These insights can also, in turn, inform architecture itself. The studio will explore design through a sequence of different scales, probing and facilitating the dialogue between urbanism and architecture. Working in the post-industrial, waterfront context of the Bridgeport, Connecticut, this studio will propose a dispersed and open campus that envisions new economies for Bridgeport and a new relationship to the water.

Bridgeport

Bridgeport, located at the mouth of the Pequonnock River, was first inhabited by the Paugussett, an Algonquian-speaking nation, prior to European colonialization starting from the middle of the 17th century. Its port and harbor on the Long Island Sound were critical for its early commercial development, which initially focused on farming, fishing, whaling, and shipbuilding. With the establishment of the New York New Haven railroad line in 1848, the city industrialized and became a center for manufacturing machinery, corsets and other garments, munitions, and eventually helicopters. Dupont, General Electric, and Remington were all once headquartered in Bridgeport.

By the 1970's, with the de-industrialization of the U.S. economy, many of Bridgeport's jobs disappeared. The loss of manufacturing left brownfield sites, abandoned buildings, and environmental contamination. Exclusionary housing policies and white flight to the suburbs caused the city's population to decline and become more racially segregated. Despite nearly 20% growth in the region in the last 50 years, Bridgeport's population has decreased by 10% since 1970. In this sense, Bridgeport is not unlike other post-industrial cities in the Northeast such as Newark, Trenton, or New Haven. Lately, Bridgeport has struggled with a negative cycle of declining property values and increasing property taxes. Bridgeport is the largest city in Connecticut, the wealthiest state of the United States, yet nearly 20% of its residents live in poverty and its average per capita income is around $21,000.

Nonetheless, with its advantageous position along 1-95 and the Northeast commuter rail corridor between New York City and Boston, the Regional Plan Association projects that in the future Bridgeport might become a regional job center for a new green economy, building on its existing urban fabric and downtown. The waterfront of Bridgeport has already been identified as both an opportunity for change and a part of the city which, by necessity, needs to be re-imagined due to its exposure to rising sea levels and climate change. Our site will be located within the Bridgeport WOZ (Waterfront Overlay Zone).

Campus

As a type, the campus is, by definition, compound. It therefore provides an ideal platform to examine the relationships between buildings. Our interest is in neither the ivy tower of higher education nor the idealized world of academic pursuit situated in a suburban or pastoral landscape. Educational institutions have come to recognize that an open engagement with and diffusion into the city, along with its diversity of ideas and people, may advance their own underlying pedagogical and institutional

agendas. In this sense, the urban campus as enclave (e.g. McKim, Mead, and White's 1894 Morningside Heights masterplan for Columbia University), may also no longer be appropriate as a model. Now, the campus is increasingly blurred as a public / private entity that absorbs an expanded program, including medical and research facilities, scientific labs, and innovation and technology incubators. Sharon Haar has noted, "education [is now more] directly connected to… the post-industrial knowledge economy." In this sense, as Pier Vittorio Aureli notes, Cedric Price's Potteries Thinkbelt (1966)— a proposal to convert a derelict industrial region and its railroad infrastructure to a post-industrial region through a decentralized and mobile educational network—seems prescient. Learning from this, we might consider the campus as a dispersed ensemble of components that will operate together with larger territories, environments, and economies. As it considers the introduction of an MGM casino as a supposed urban and economic catalyst, the Bridgeport Thinkbelt may also provide a counter-narrative for the future of the city.

The semester will be organized into three phases:

I. Knowledge Precedents (2 weeks)

As a prelude, we will start by examining our own discipline. The studio will start with the analysis of selected "knowledge" precedents—20th century and early 21st century architectural examples including kindergartens, schools, university buildings, and laboratories—that embody or claim certain ideological and pedagogical agendas vis-à-vis their spatial hierarchies, organization, circulation, structure, façades, and mechanical systems. Each student or team will select a precedent, develop original drawings and models, become an expert, and take what they need. While those selected buildings are specific responses to certain contexts, places and times, we will attempt to extrapolate attributes that can be transferred to other sites, programs, and conditions. What is the relationship between ideology and form? How can architecture learn? What can we learn?

Bauhaus Dessau	Walter Gropius	1926
Openluchtschool, Amsterdam	Johannes Duiker	1930
Hunstanton Secondary Modern School	Alison and Peter Smithson	1954
Montessori School, Delft	Herman Hertzberger	1960 - 2009
Richards Medical Center	Louis Kahn	1962
University of Brasilia ICC	Oscar Niemeyer	1962
Yale School of Architecture	Paul Rudolph	1963
Main Building of the Polytechnic, Otaniemi	Alvar Aalto	1964
École d'Art et d'Architecture, Chandigarh	Le Corbusier	1965
Simon Fraser Academic Quadrangle	Arthur Erickson	1967
Facultad de Arquitectura de Sao Paulo	Joao Batista Vilanova Artigas	1968
Berlin Free University	Candilis, Josic, Wood	1974
CIEP Schools	Oscar Niemeyer	1982
Educatorium	OMA	1997
Zollverein School of Management and Design	Kazuyo Sejima + Nishizawa	2006
Fuji Kindergarten	Tezuka Architects	2007
Kanagawa Institute of Technology	Junya Ishagami	2008
Nantes School of Architecture	Lacaton & Vassal	2009
Leutschenbach School, Zurich	Christian Kerez	2009

II. Urbanism (3 weeks, prior to Midterm)

Looking closely at Bridgeport, we will analyze and draw its existing urban conditions and systems. Historic development, urban form, built fabric, land use, infrastructure, transportation and circulation,

water, landscape, environment, and social and economic analysis will be collectively examined by the studio. Urban research is intended to be generative, i.e. leading to specific insights and potential design directions. Students will elaborate the program of their campus and establish a proposed urban massing. Scale comparison, superimposition, figure-ground, and prototypical sections will be important techniques and representational devices. Equally important to the physical distribution or pattern of buildings is the overall narrative behind the intervention, and its programmatic components and relationships. At this scale and with limited time, the suppression of detail may enable the development of a polemical position relative to the larger territory, and a vision for the future identity of Bridgeport.

III. Three Buildings (8 weeks, after Midterm)

The primary emphasis of the studio is the design of a set of three interrelated buildings, approximately 10,000-50,000 square feet each, located along the Bridgeport waterfront and situated within an urban campus proposal established prior to the Midterm. The buildings will be located on different sites with different programs, potentially taking on different forms as such (bar, tower, mat, etc.). Architectural insights from the Knowledge Precedents, independent of site or program, will be abstracted to be adaptable to different circumstances. Without denying the role of intuition in the design process, a rigorous relationship between the Knowledge Precedent and new building, or operation, should be proposed.

A key motivation for the premise of multiple buildings is to design not a singular or isolated intervention, but rather an archipelago or network of related parts. In this sense, we are interested in systems rather than objects. Needless to say, a convincing degree of architectural specificity is expected (spatial hierarchy, structure, circulation, facades, materiality, etc.) and physical models will likely help achieve this. Program may include classrooms, research labs, incubator spaces, administrative offices, libraries, auditoria, recreation spaces, cafeterias, as they are relevant to each student or team's broader narrative. With the articulation of these buildings at one scale, the overall urban campus may also evolve at another scale.

Ultimately, the ambition of the studio is dialectic and two-fold: 1. envisioning a new identity for Bridgeport's waterfront based on actual conditions and realities, proposing new economies and systems for the city, and developing a physical structure based on learning, and 2. articulating a relationship between architectural form and ideology, history, and pedagogy, independent of context.

Notes

- The studio meets for desk crits on Monday and Thursdays from 1:30-6:30pm.
- There will also be a weekly all-studio session on Wednesdays from 3:00-5:00pm.
- A trip to Bridgeport, CT will be arranged in January or February.
- A detailed schedule with pin-ups, reviews, and requirements for presentations will be distributed at the beginning of the semester.
- All studio work will be compiled into a book summarizing the studies and outcomes of the semester. Given the range of different precedents, sites, and ideas explored, it is expected that students coordinate their work into a shared template, format, visual language, etc. so that the knowledge can be presented coherently as a single body.
- Work, including model photographs, will be submitted to a Google Drive.
- Teamwork and collaboration is encouraged. Students may work independently or in teams of two.

Readings

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ANTI-FRAGILITY: CROP DIVERSITY & CLIMATE CHANGE
Advanced Studio 4 - Spring 2018
Columbia University Graduate School of Architecture, Planning and Preservation
Critic: Caitlin Taylor

Photo: Jim Richardson

INTRODUCTION

Agricultural production exists at a particularly fertile intersection between the common themes of Studio 4 - scale, technology, environment, circular economics, resilience and anti-fragility. Nowhere is the environment more intimately interwoven with technological advancement than in modern farming practice, the privileging of productive landscapes via control and mechanization. Farming is a complex system of inputs and outputs (embodied energy, nutrients, labor, sunlight, water cycles, climate patterns, indigenous knowledge, globalized economies, localized ecologies, government incentives, capital investment, political will, waste streams, nourishment, corporate colonization, scientific discovery, environmental impact, cultural memory) that reveals the interconnection of global forces, but is also necessarily local and literally rooted to its place.

A looming food crisis calls into stark relief the reliance of our food system on increasingly fragile industrial-scale monocultures. 10,000 different varieties of wheat once grew in China alone; now the documented number is well below 1,000. 6,500 species of apples that once grew in North America have gone extinct. Meanwhile, corporate monopolies introduce new monocultural crops that are genetically modified for increased productivity but dramatically upend local ecological balance.

Mechanical radii of new machines map the historical ideals of technocracy across the modern landscape, while computerized management tools privilege homogenizing ecologies as the pseudo-scientific answer to a technocratic social order. Automated systems are built whereby food production is a result of optimized chemical inputs, satellite communications, remote sensing devices and GPS tracking. Lockheed Martin's tractor-based technologies measure 13 weather parameters in 15 minute increments and send the data to a computer in the field. 430 gauges per 10 acres measure irrigation and yield measurements are taken every three seconds during harvest. Constant feedback informs the automated input systems - seeds, fertilizers, and pesticides are dispensed accordingly. Local difference disappears.

Agricultural monocultures, like all fragile systems, fail when subject to stress. Invasive pests find new opportunities for growth, soil degrades, fields erode, and ecological equations are imbalanced as native species die off en masse. Meanwhile, climate scientists have issued a call to action - global food production requires climate-ready crops within two breeding cycles. In the face of a rapidly changing climate, the resilience of our global food system relies on genetic crop diversity, which provides an invaluable resource in the form of a multiplicity of options. The effect of genetics and evolution in agricultural methodology is inherently anti-fragile because annual growth cycles provide an opportunity for constant adaptation. The most resilient germ lines reveal themselves under stress.

One notable response to this recent discourse in agriculture has been the formation of seed banks, which have been designed to protect and preserve the genetic information of our modern crops for use at some unknowable future point when our food supply requires a complete reboot. Though many scientists believe firmly in the merits of these seed banks as insurance policies against a global food crisis, there are as many critics that identify limits to the centralized model of corporate and governmental management. Critics claim that crop diversity and resilience depends on farmers' ability to quickly adapt and scale based on changing conditions, without wading through corporate hierarchy to access trademarked seed stock. Though both scientists and farmers recognize the immense power that resides in the agricultural memory of seeds, their methods of leveraging that power are at odds.

STUDIO FRAMEWORK

The Hudson Valley is a productive territory on which to study these issues, as it is both an agricultural hub in the northeast (New York City's most proximate "foodshed"), and a crucial component of the New York City watershed. Within the context of the larger Studio 4 curriculum, we will seek to understand the watershed as a water body with particularly complex environmental, political, ecological, and infrastructural control. The resilience of the watershed will be analyzed specifically as it relates to agricultural production in the Hudson Valley, projective climate change scenarios, and New York City's unmet demand for "local" food.

Students will locate their work precisely within the networked landscape of food production surrounding New York City and imagine future scenarios in which climate change has redesigned those landscapes according to new environmental variables. Specifically, how food is grown and travels within the region will be understood as a key infrastructural pathway in the face of a changing climate, and the resilience of that pathway will be examined at multiple scales. Food access will be understood as infrastructure and politics, economics and social justice.

Multiple scales will be studied simultaneously - from the genetic data of indigenous crops to the biotechnology enhancing productivity, from the scale of a single plant to the deep soil section of native grassland root structure, from a field to a networked urban food system. We will learn from farmers and ecologists about the intelligence of native ecologies, and what information is preserved along with genetic diversity. We will study politicians, corporations, and governments through history as they defined the singular economic power of crop subsidies and incentives. We will learn from scientists about how to preserve genetic diversity in seed banks, and about bioengineering advancements in crop productivity. We will learn from activists and community groups about how to build just and self-determined food systems in regional economies.

We will ask what wisdom the regenerative practices of crop rotation, diversification, pollination, seed banking and intercropping can lend to our urban food infrastructure. We will ask how architecture can act as a mediator in the fraught relationship between biotechnology research and local agricultural intelligence.

PROGRAM AND SITE

The program for this studio will be a crop breeding research facility and seed storage vault, with associated agricultural production landscape, for the Hudson Valley Farm Hub. The Farm Hub is an existing non-profit center for research and education located in Hurley, NY that provides farmer training, hosts research, promotes an equitable food and farm economy, and acts as an educational resource for area farmers. Located between the Ashoken Reservoir and Esopus Creek, just upriver from the arterial Catskill Aqueduct, the Farm Hub is currently developing an applied research program for the Hudson Valley that will focus on resilient agriculture and climate-smart farming. At the building scale, students will design a home for this initiative within an anti-fragile food network. As all students in Studio 4 will be asked to grapple with the Circular Economy, in this section we will examine the buildings and landscapes designed in each project according to their inputs and outputs, and ask what role architecture can play in shaping the discourse around agricultural production for our cities.

While the primary site of building-scale intervention may be a research and education facility for the Farm Hub in Hurley, NY, each student's work will also take a clear position on future climate scenarios as they relate to the Hudson Valley as a regional foodshed and watershed. Design work will include an investigation into how innovative resilient landscapes can be replicable, scalable, flexible, and anti-fragile in a variety of rural, suburban, exurban, and urban conditions.

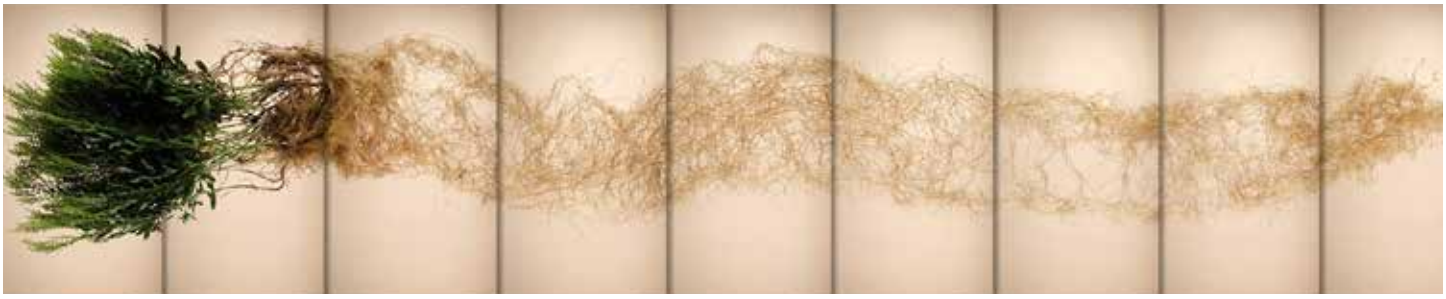

Photo: Jim Richardson

FORMAT

PROJECT 1: RESEARCH FRAMEWORK (2 weeks) - As a studio we will develop a vocabulary with which to rigorously describe modern agricultural production and its effect on the landscape, to be catalogued in a booklet before midreview. Economic and policy drivers, tools of mechanization, methods of crop breeding and seed banking, and indigenous planting techniques will be studied, diagrammed, and analyzed for their spatial potential. We will read about the history of agrarian urbanism in order to position our discourse.

Part 1: Each student will analyze and document the food from one meal you eat this weekend and try to track at least one individual source ingredient back to: how it's grown (tools and/or machines); where it's grown; labor requirements; economic and policy drivers that shape production (historically and/or today), water requirements for production, how it gets to you and in what quantity.

Part 2: Each student will catalogue one each of the following: historical and/or contemporary architectural precedent of an agricultural experiment relative to urban form; method of maintaining crop diversity; method of limiting crop diversity or developing monoculture; piece of food infrastructure pathway from farm to consumer; method of corporate control; indigenous agricultural practice; and one specific effect that climate change is having on agricultural production.

PROJECT 2: MAPPING THE HUDSON VALLEY AS FOODSHED AND WATERSHED (2 weeks) - Students will perform a series of mapping exercises to understand the rural to urban continuum (and associated flows of energy, water, and food) of the Hudson Valley. This project will culminate in a pin-up where each student synthesizes their research into one large projective drawing that indicates the direction of their individual project moving forward.

Project 2 will include a site visit to Stone Barns Center for Food and Agriculture, and the Hudson Valley Farm Hub, where we will meet some of the pioneers of resilient agriculture and tour their operations.

PROJECT 3: FARM HUB RESEARCH FACILITY AND AGRICULTURAL LANDSCAPE

Building design and infrastructural networks will be designed according to a more detailed schedule to be developed at the beginning of the semester.

SCHEDULE

W	Jan 17	Lottery
Th	Jan 18	Studio Intro
M	Jan 22	Project 1, Part 1: Pin-Up
Th	Jan 25	Project 1, Part 2: Pin-Up
M	Jan 29	Desk Crits
Th	Feb 1	Project 1: Pin-Up
M	Feb 5	Desk Crits (& Project 1 booklet complete)
Th	Feb 8	Desk Crits
M	Feb 12	Project 2: Pin-Up
Th	Feb 15	Desk Crits - Individual Project Direction
M	Feb 19	Desk Crits
Th	Feb 22	Desk Crits
M	Feb 26	Midreview
Th	Mar 1	Desk Crits
M	Mar 5	Desk Crits
Th	Mar 8-9	Hudson Valley Trip: Stone Barns, Hudson Valley Design Lab, Farm Hub
M - F	Mar 12 - 16	Spring Break, no studio
M	Mar 19	Desk Crits
Th	Mar 22	Desk Crits
M	Mar 26	Desk Crits
Th	Mar 29	Desk Crits
M	Apr 2	Desk Crits
Th	Apr 5	Studio Pin-Up
M	Apr 9	Desk Crits
Th	Apr 12	Desk Crits
M	Apr 16	Desk Crits
Th	Apr 19	Desk Crits
M	Apr 23	Desk Crits
W-Th	Apr 25-26	Final Review

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Civil Eats (www.civileats.com)

NYC Regional Foodshed Initiative - Urban Design Lab

Hudson Valley Foodshed Conservation Plan

Rising Waters: Helping Hudson River Communities Adapt to Climate Change

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Knowledge and the City

In 1966, through an unsolicited proposal of "Potteries Thinkbelt," Cedric Price envisioned a transformation of a town-region of North Staffordshire in England, in which its functional territory was no longer defined by medieval town centers, an ideal grid, or other familiar administrative edifices. Instead, his plan appropriated the existing infrastructural network to produce a new framework for the city - education. Although unrealized, the project remains an important moment when knowledge production and its spatial mechanisms were proposed as the main drivers for the definition and transformation of the city. The new relationship between the ideals of the city (education) and the operations of the city (infrastructure, mobility, industry, technology, housing etc.), between the aspirations of the city and its environment, were articulated through the city-scale framework of "anticipatory architecture"[1] and the participation of the newly defined student body, the new citizens. Education was a "generator of urban location and form."[2]

Working with the program of the public school shared year-wide this semester and acknowledging both precarity[3] *and* possibilities in knowledge in the context of a knowledge economy, the studio, a part of the on-going research and studio series "Knowledge City," participates in the continuing discourse on the relationship between the architecture of education and the city. Exploring the possibility of a novel typology of "public campus,"[4] the investigation aims to challenge the familiar formats of knowledge production and their spaces in the context of contemporary cities while utilizing the potentials in the typology of schools, to generate new configurations for the collective of the city.

As a genre of architecture, educational environments have been one of the most instrumental experimental platforms to instigate new organizations and forms of collectivity as well as new values and ideologies. The Groundscraper of Berlin Free University prompted the architecture of "Opera Aperta" attempted by Team 10 and others, and Ant Farm's inflatable "Clean Air Pod" that declared "air failure" at the 1970 U.C. Berkeley campus pushed forward the typology of tactical inflatables, soft yet subverting. Challenging institutional and typological conventions in different ways, Herman Hertzberger's Montessori buildings explored configurations of ideal collectivity within the framework of "School as City," while Aldo Van Eyck's playgrounds across post World War II Amsterdam spatialized the notion of learning dissociated from conventional institutional enclosures, through the non-hierarchical, distributed design that asserted the idea of the city and education open to and re-imaginable by anyone. The Open Air School movement at the beginning of the 20th century, Neutra's indoor-outdoor campuses, and the contemporary Edible Schoolyard Movement challenge the assumed boundary of the type and suggest its provocative permutations while articulating renewed ideals of the individual's place in both socio-political and natural milieu. Through the

[1] Isabel Allen, 'Anticipatory architecture: Cedric Price', *Architects' Journal,* vol.204 no.8 September 5, 1996, pp.20-21,24-25, 27-41
[2] Cedric Price and Paul Barker,'The Potteries Thinkbelt',*New Society*, 2 June 1966, pp.14-17.
[3] See the notion of precarity in the context of contemporary "Edufactory" and neoliberal knowledge economy in Aureli, Pier Vittorio. 2011. 'Labor and Architecture: Revisiting Cedric Price's Potteries Thinkbelt'. Log, No. 23. Anyone Corporation: 97–118.
[4] The contemporary term "campus" originates from Latin *campus* "a field," as well as English *camp* which is closer to the actual spatial and operational structures of contemporary institutional campuses. See also Easterling and Agamben's reading of camp and campus.

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examination of the historical and current models, manifestos, and criticisms on educational institutions and their architecture and the experimentation for original positions and strategies, the work of the studio pursues the architecture of knowledge that articulates and prompts the ideal future urbanisms of the city.

(Counter-) Environment, (Counter-) Education

In a series of symposiums and discussions at MoMA in 1972 titled “The Universitas Project,” Emilio Ambasz and the multidisciplinary participants including Manuel Castells, Umberto Eco, Jean Baudrillard, and Henri Lefebvre explored the possibility of “Institutions for a Post-Technological Society,” “a new type of university concerned with the evaluation and design of our man-made milieu.”[5] Despite the fact that the effort did not actualize and that it still invoked the familiar institutional structure of a university as a solution, the project was an attempt to “inquire into the nature of the man-made environment” and the role of design and agency of education in the context. The project sought to, through new modes of education, find the conceptual link to produce and communicate a more comprehensive thus more resistant definition of the environment, that connects and blurs the binary distinctions between the artificial and the natural, author and products, and most importantly the technical and the social.

> *If one begins with the affirmation that “man constructs his milieu,” and if one refuses to reduce this “man” to a technical agent imbued with a universal and ahistorical rationality, then the problem becomes one of a social relation. The environment is no longer a physical “given,” exterior to human action, but a particular form of matter (human and nonhuman), an expression, a relation among elements. But what elements? And the expression of what?* [6]

After 45 years, the key concerns of “Universtas” - the environment as a complex and intertwined bio-techni-socio-political milieu; and the instrumentality of knowledge as a medium for its articulation and a framework for necessary transformation - are still, if not more, relevant. The studio will investigate multifarious and constantly evolving notions of the environment and education and their manifestations, aiming to elucidate the often elusive performance of (hidden) environments[7] and the possibility of (counter-) education[8], or radical pedagogies, through strategically framed design proposals.

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[5] Emilio Ambasz, “Introduction.” In *The Universitas Project: Solutions for a Post-Technological Society*, edited by Emilio Ambasz. The Museum of Modern Art, 2006.

[6] Manuel Castells. “Urban Symbolism and Social Movements: On a New Institution for the Study of the Urban Environment.” In *The Universitas Project: Solutions for a Post-Technological Society*, edited by Emilio Ambasz. The Museum of Modern Art, 2006.

[7] See the notion of hidden environment in McLuhan, Marshall. "The Invisible Environment: The Future of an Erosion". *Perspecta*, Vol. 11 (1967), pp. 163–167., also McLuhan, Marshall. *Counterblast*. New York: Harcourt, 1970.

[8] See the historical account of of radical reform of educational institutions and the ideas of Counter Education, in Stein, Maurice, Marshall Henrichs, Paul Cronin, Adam Michaels, Jeffrey Schnapp, and Larry Miller. *Blueprint for Counter Education*. Box Pck Pa edition. New York: Inventory Press, 2016.

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Uncertainty as Catalyst

Taking advantage of infinite programmatic and demographic complexity, the studio utilizes the New York metropolitan area and its extended water territories as a testing ground. The hardbound island of Manhattan has been the most potent and prolific paradigmatic site for the architectural and urban explorations for the past centuries.[9] The 2018 Knowledge City studio proposes to proactively expand this familiar zone of disciplinary and political instrumentality beyond the constructed edges of Manhattan island, acknowledging the expanded operational territories of the contemporary metropolis tightly interconnected with various networks as well as shared ecologies. The projects engage various site/zones of heightened precarity and uncertainty to explore the notion of fragility and anti-fragility through the architecture of education. Exploring the program of a novel “public campus,” the studio aims to engage diverse momentum, agendas, and agencies around the territories of risks as the vehicles and frameworks to project the possibilities of new collective domains in the city. The work will take the space of seeming instability, vulnerability and crisis as the sites of inventive spatial practices that articulate a renewed notion of the city, to reprogram the city.

Approaches

In the essay "Utopie Experimentale: Pour un Nouvel Urbanisme," Henri Lefebvre defines “Experimental Utopia” as "the exploration of human possibilities, with the help of the image and the imagination, accompanied by a ceaseless criticism and a ceaseless reference to the given problematic in the 'real." In the context of the current reality - continuing socio-political and environmental crisis and ever deepening inequalities - the studio’s work aims to utilize the program of education and learning as a platform for daring yet effective experimentation that speculates on the ideal relationships between the goals of individuals, institutions, and the city, and the agency and opportunities of architecture in the milieu.

The studio will start with a research and analysis effort through a review of relevant discourse and an overview of both historic and contemporary cases through readings and surveys. Following the initial overview, fact based investigations on selected topics or examples with focused research and analytic documentations will instigate the individuated agendas of the design projects to be set forth in the next phase. Initiating the design phase, the students will be asked to define a set number of project trajectories and outline basic framework, potential strategies, and the site(s) of interest pertinent to each project.
The design work, revised through an iterative process in response to the ongoing investigations and dialogue within the studio, will be developed articulating the rationales and intentions at multiple scales and time frames regardless of the projects’ physical bounds -from global and regional scales of intersecting networks and operations; and the urban scales of the newly defined “campus” and connected collectives; to the architectural scale of buildings, systems, configurations, and their

[9] See the discussion of Manhattan and Venice as paradigm islands, in Stoppani, Teresa,*Paradigm Islands: Manhattan and Venice. Discourses on Architecture and the City*, Abingon, Oxford: Routledge, 2010

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interfaces. The emphasis of the studio is on the production of rigorously articulated architectural propositions that each engages the critical inquiry of the studio topic with a distinctive thesis.

** Group work for some portion of the semester will be encouraged but students will have options to work individually if necessary.*

** Studio excursions to selected sites will be scheduled for February.*

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Columbia University GSAPP

A4104 Advanced IV; Scales of Environment Studio M. Arch

500 Avery: M, Th (1:30-6:30pm), W (3:00-5:00pm) Spring 2018

Phu Hoang (pdh4@columbia.edu)

Park, Shop, Work, Learn:

Designing for Incomplete Futures

(*Version 1/8/18)*

Housing in Osaka Baseball Stadium

Questions

In our unstable societies of change – in climate, programs, and even sites –when is architecture ever "complete"? An intended program is often outlasted by the building itself, raising questions about how we define architectural completion. Can designing for a state of incompletion become a final architectural act? How does planned obsolescence in the built environment reframe the discipline's definition of both program and type?

The studio will design projects with both near and distant futures, connected to each other by a state of incompletion. This will require students to invent design strategies of incompletion, flexibility and planned obsolescence. The projects' near future will be an urban building type that is common today but will probably become obsolete in the future. Students will select from a parking deck, big box retail or an infrastructure facility. The near future will also address the site's current relationship to the water. A distant future, with a different water condition, will require transforming the selected building type into an academic facility for a university. This studio is not about adaptive reuse. Instead, it is about designing for radical change-- whether from environmental, programmatic, or social forces.

Challenges

In the studio, students will be challenged to design for a continual state of incompletion. Each project will transform from the selected building type (parking deck, big box retail or infrastructure facility) into an academic building. The project's near future will eventually become obsolete due to changing social forces (car share, online shopping, renewable energy). Its distant future will be an academic building which will need to adapt to an entirely different environmental condition. This design challenge will challenge the fixity of architectural programs and prompt a more open and flexible relationship to the environment.

The university, as urban institution, is an suitable framework for the scenario proposed by the studio. Universities are constantly changing micro-societies that exist within a fixed built environment—but what if the physical spaces of the university transformed over time? The studio will propose designs for the future expansion of the Cornell Tech campus. Within this context, a transforming academic building on New York's Roosevelt island will address both the water environment around it as well as the social environments within it.

Project Site

Historically, Roosevelt Island was the location for many of the city's hospitals and asylums-- characterized by Rem Koolhaas as a "storehouse of 'undesirables'."It was also the site of numerous urban imaginaries from Louis Kahn to Peter Cook to Rem Koolhaas. This social and architectural history makes Roosevelt Island an ideal site for a future scenario of architecture, transforming over time in response to both social and environmental change.

The studio will present 3 sites along Main Street in Roosevelt Island. Recently, the Cornell Tech campus opened in the southern end of the island. This campus, both an extension of and separate from its parent institutions (Cornell University and Technion), is founded on the ideals of connecting academic research with commerce. The studio imagines that the Cornell Tech campus will eventually expand to sites on the northern side of Roosevelt Island. The chosen sites will be designed to meet both the current needs of the community while transforming over time for a growing campus.

How We Will Work

The studio will be conducted as an open workshop in which collaboration between students will be highly encouraged. Students will design for three sites, thus allowing for parallel discussions between classmates. Expanding the boundaries of the architecture discipline will be integral to the studio methodology. The students' work will be trans-disciplinary in their nature and will be influenced by the social sciences, arts and sciences. A series of trans-disciplinary discussions with sociologists, climate scientists and artists will be integral to each student's project.

Schedule

<u>Project 01: Designing For Planned Obsolescence</u>

(Review on February 5th; 2 weeks)

Simultaneous research of transformable architecture case study and the design of a prototypical building for a near future scenario. The research and design will establish an argument towards the project site and its surroundings. This work must be iteratively explored for its potential in formulating a concept argument towards the project.

Project 02: Mid-review

(Mid-review on March 1st, 3 weeks; Ware Lounge)

Each student will present at the mid-review the research and the design proposal for both near and distant futures on the site. The proposals will be based on innovative strategies that allow for transformation from one building type to another. The proposals should clearly and precisely define the project's argument relative to both site and program.

Spring Break

(March 12h – 16th, 1 week)

Project 03A

(3/4 review date TBD, 2 weeks)

Project 03B

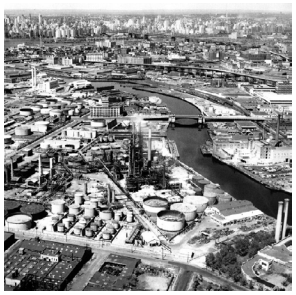
(Final review on April 25th, 3 weeks; Avery 408 & 409)

Studio References:

To be determined

Columbia GSAPP Spring 2018
Advanced Studio IV_006
Scales of Environment
Studio Critic: Tei Carpenter
Contact: tei.carpenter@columbia.edu

In Excess:
By-productivity, Objectsystems and Infrastructural Frontiers for Newtown Creek





Introduction

The waste and water infrastructures of New York City are its shadow heroines and background music—overburdened, outdated, and continuously processing, transferring, and accumulating the city's and our own outputs. Heaps of unwanted trash bags ready to be trucked out of the city every day and leaky, overflowing sewage pipes offer a counter narrative to modernist progress. These infrastructures mediate repressed and abject materials and fluids, and are not so much smooth and fast technological machines, as they are forgotten systems inundated by excess. It is in this excess that we might explore a different kind of nature and definition of environment, a Third Nature[1] (borrowing a term from anthropologist Anna Tsing) that accepts our environment as compromised as a starting point, and admits coexistence with contamination and waste as a given to open up hopeful new design possibilities for our strange time.

New York City is a hydropolis, surrounded, governed, and shaped by its waterways. Water both binds and divides the city, a collection of islands that historically prospered due to its critical aqueous position for international industry, transport, immigration, and trade. But these days, water is a slippery thing, quite

1. Anna Tsing, *The Mushroom at the End of the World* (Princeton: Princeton University Press, 2015), viii.

Images (L-R): Newtown Creek birds-eye view; Bullock's Oriole Nest (photo: Sharon Beale); Recyclable material bundles at SIMS Material Recovery Facility (photo: Tei Carpenter); Newtown Creek Wastewater Treatment Facility "Eggs" by Ennead Architects.

literally difficult to grasp, at once charismatic and hostile. New York presents a contradictory attitude towards water and its public perception in how water contributes to our urban experience. On one hand, New York City is developing an engaged, resilient edge of parks, recreational activities, and greater public accessibility to the water for leisure and enjoyment. On the other hand, with mounting anxieties due to global warming, rising water levels and the realities of the impacts from Hurricane Sandy, the city's response has also been one of fortification with barriers, walls, and big Us. This response suggests that water, and nature by extension, should be feared, opposed and controlled.

The legacy of infrastructure in New York City, from the controversial figure of Robert Moses to today's increasing privatization and the threat of a new federal infrastructure policy that could smother public works, has been a top-down technocratic affair. Even the well-known unbuilt infrastructures of the city which were once considered to be idealistic, including Buckminster Fuller and Shoji Sadao's "Dome Over Manhattan" (1960) and Paul Rudolph's "Lower Manhattan Expressway" (1967), could be grouped into a similar category. In recent years, it has been the "shovel-ready" projects that favor metrics, strict budgets and efficiency which have taken priority over qualitative, equitable and visionary proposals. The studio takes the latter concerns as a priority.

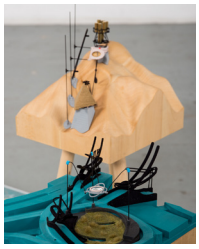
From this position, we will rethink value propositions for infrastructure and develop new approaches to waste and water infrastructures in the New York City waterways that are optimistic, exuberant and radical. Designing for infrastructure with other dimensions and capacities, as anthropologist Brian Larkin writes, can be both aesthetic and atmospheric.[2] For example, consider the horizon line that is produced by a materials transfer installation, the shiny marbleized oily byproduct on the surface of the water or the vapor and steam of a wastewater treatment system.

New models are necessary for designing infrastructure at a time of new normals when global warming is no longer a looming threat but amongst us and the need for collective civic design is critical. While the design of infrastructure has been limited because of a technocratic approach, in fact infrastructures have alternative capacities precisely because they are not necessarily buildings. Rather than relying on a modernist attitude of problem-solving, functional efficiency, and sterile designs, can we produce frisky infrastructures that propagate and spatially risky proposals that have new energetic capacities for the city?

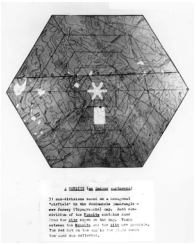
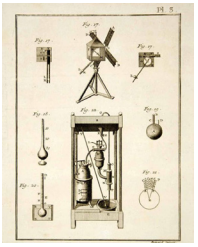
Approach

The following three points will act as guiding concepts and principles for the design approach of the studio: By-productivity, Objectsystems and Infrastructural Frontiers.

2. Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42 (2013): 329.





By-productivity

We will pursue designs that are *by-productive*, which harness and exploit existing and potential waste and water streams, open loops, energy recovery, and ecological change caused by human impact. If a by-product, according to the Oxford English Dictionary, is an incidental or secondary product made in the manufacture or synthesis of something else, we will transform this unintended output into a new productive design resource. We will accept waste and water systems as part of a larger urban ecology in the city—one that describes the city's metabolism through cycles of consumption and discard, inputs and outputs, allowing for otherwise unavailable abundance to emerge and locating productive couplings and overlaps to inform our designs. In this, a new kind of value proposition concerning inventive resource management, new material cycles, and an expanded definition of environment will advance and suffuse our work.

Objectsystems

Infrastructure is not a thing. Unlike a building, infrastructure operates at multiple scales of space, force and time, and we will develop experimental multiscalar approaches to our design proposals. Adopting historian Paul Edwards' argument that infrastructures, "link macro, meso, and micro scales of time, space and social organization,"[3] we will consider our designs at each scale to develop a proposal that can be read as a multiscalar assembly with material and aesthetic implications. We will borrow from post-minimalist artist Robert Smithson's idea of an entropic geological time to consider planetary scope and the material histories and futures of our designs.

But scale is not synonymous with size. Indeed, scale is relative but size is absolute. You cannot "scale up" a mouse to the size of a cat because its internal organs would no longer perform, in the same way as you cannot necessarily "scale up" or "zoom into" a building to design infrastructure. How do we apply our architectural training, one of precise engagement with dimensions and size, towards the design of infrastructures? We will explore and develop the concept of *objectsystems*. Objectsystems, on the one hand,

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3. Paul N. Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," in *Modernity and Technology*, ed. Thomas J. Misa, Philip Brey, and Andrew Feenberg (Cambridge, MA: The MIT Press, 2003), 186.

Images (L-R): Smout Allen, L.A.T.B.D, 2016; Dunne & Raby, Foragers, 2009; Alexander Florensky, Modest Architecture (Meteorological Information Kiosk; amid.cero9, Magic Mountain, 2009; Robert Smithson, Non-Site (an indoor earthwork), 1967; Diderot, Anemometer Machines, 1778.

can be read and designed as objects much like an installation or a building, but in fact they are hybrid systems that are at once architecture, landscape, and infrastructure and carry with them the potential to be perceived as fragments at multiple scales.

Infrastructural Frontiers

We will design new futures and alternatives for urban infrastructures and waste and water systems with counterintuitive and hopeful possibilities, which build their own design logics and narratives. Instead of treating nature as stable and pristine, we will shift our thinking to consider the intertwined dependence between humans and nature to open up hopeful possibilities that respond to dynamic states of change in uncertain times.

A crucial frontier for infrastructure is in its capacity to provide a new model for education and to raise public awareness and environmental consciousness within the city of its shared resources and services. How might design be transformative to produce models for civic engagement towards a greater public good? How might we use our tools for designing form, organization, program, and behavior towards a new public work?

What Will We Do?

The studio will use Newtown Creek and its bordering edges as a site to test its hypotheses and design explorations. The Creek, which runs into the East River, is 3-1/2 miles long and bridges the boroughs of Queens and Brooklyn. While once a fertile and scenographic site, today Newtown Creek presents an intense yet prototypical urban site of ecological transformation caused by human impact. Due to heavy industrial activity with such materials as asphalt, oil, copper and manure, today it is described by some as "the most polluted waterway in America," and was designated as a Superfund site in 2010. Brooklyn Community Board 1, which borders Newtown Creek to the south is one of four districts in New York City that handle 70% of the city's total waste, raising issues of maintenance, spatial justice and equity.[4]

4. "Transcript of the Minutes of the Committee on Sanitation and Solid Waste Management" (City Council, New York, NY, February 13, 2015), 6.

Newtown Creek's Third Nature and its material archaeology will be studied and extracted to consider new opportunities and futures for the site. We will use Newtown Creek as a collective site to produce infrastructural species that interact, negotiate, and depend upon one another.

Students will be required to articulate a rigorous argument in relationship to the studio brief that tightly engages narrative and representational techniques. We will look to climate fiction and speculative design to pursue progressive, future-oriented designs that work with the here and now. Spatial, formal, and representational possibilities will be explored from the start of the semester. Students will expand their repertoire of representational tools to produce complex, multiscalar designs.

The semester will progress through three cumulative phases that will inform the development of the final project. Studio work will be supplemented by in-class presentations, lectures, workshops, meetings with the Newtown Creek Alliance and Riverkeeper, and field trips to local waterway infrastructures such as the Newtown Creek Wastewater Treatment Facility, North River Wastewater Treatment Plant and the SIMS Material Recovery Facility. Detailed assignments and deliverables will be distributed at the beginning of each phase.

Phase 01 (2 weeks)
Groundwork
We will establish a common conceptual framework and shared vocabulary around studio themes dealing with infrastructure, public works and Third Nature through seminars and in-class presentations. A foundational understanding of the site will be established with a collective site analysis through inventive drawing and modeling techniques that will be both analytic and atmospheric.

Phase 02A (2 weeks)
Instrument
Building on Phase 01, students will develop an inhabitable instrument that responds to initial investigations and observations extracted at the site and processes an unexpected waste or water system to see, sense, collect, materialize and form the space around it anew. We will study precedents derived from art, architecture, scientific technology, natural science, and environmental management to guide this phase.

Phase 02B (2 Weeks)
Milieu
Alongside the design of the instrument, students will also co-construct its milieu. We will consider materiality and potentials of its ecology and ground definitions. The design of the instrument and its milieu as an objectsystem will be explored at the micro, meso, and macro scales.

Phase 03 (8 weeks)

Synthesis

Extending the work from Phase 01 and 02, students will choose a site at Newtown Creek and categorically determine a scale and scope to introduce specificity and complexity into the final design project. There is no pre-determined project size, thus an argument must be developed for the development of the project scale as an infrastructure. Students will expand their initial designs into infrastructural installations dealing with waste and water systems and inflect their projects with an educational dimension.

As a studio, we will negotiate across Newtown Creek as a site and across the studio's design projects to produce a collective and interdependent proposal for the future of Newtown Creek.

Key Dates

Mid-Review: March 1
Spring Break: March 12 - 16
Final Review: April 25

A detailed schedule will be handed out at the beginning of the semester.

Studio Format

The studio will meet Mondays and Thursdays from 1:30-6:30pm. On Wednesdays there will be lectures across the Advanced IV studios from 3:00-5:00pm. Students must be present during all studio sessions, pin-ups and reviews. Students will work collectively and in groups throughout the semester and group work will be encouraged for the final project.

Students are expected to foster a studio culture of mature collaboration and respectful critical discourse. Within the studio, students should strive to engage and learn from one another. At the end of the semester, students are required to digitally submit their final materials and model photographs from both the mid-review and final review to the studio critic.

Studio References

Dana Cuff, "Architecture as Public Work," in *Infrastructure as Architecture: Designing Composite Networks*, ed. Katrina Stoll and Scott Lloyd (Berlin: Jovis Verlag GmbH, 2010), 18-25.

Anthony Dunne and Fiona Raby, *Speculative Everything: Design, Fiction and Social Dreaming* (Cambridge, MA: The MIT Press, 2013).

Paul N. Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," in *Modernity and Technology*, ed. Thomas J. Misa, Philip Brey, and Andrew Feenberg (Cambridge, MA: The MIT Press, 2003), 185-224.

Brian Larkin, "The Politics and Poetics of Infrastructure," *Annual Review of Anthropology* 42 (2013): 327-343.

Lateral Office, *Coupling: Strategies for Infrastructural Opportunism: Pamphlet Architecture* 30 (New York: Princeton Architectural Press, 2011), selections.

Reinhold Martin, "Infrastructure and Mediapolitics," in *The Urban Apparatus: Mediapolitics and the City* (Minneapolis: University of Minnesota Press, 2016), 141-153.

Cristina Díaz Moreno and Efrén Garcia Grinda (amid.cero9), *Third Natures, A Micropedia* (London: Architectural Association, 2014).

Timothy Morton, "And You May Find Yourself in an Age of Mass Extinction," in *Aqueous Earth*, ed. Kari Conte (New York: International Studio and Curatorial Program, 2017), 33-45.

Robert Smithson, "A Sedimentation of the Mind: Earth Projects (1968)," in *Robert Smithson: The Collected Writings*, ed. Jack Flam (Berkeley: University of California Press, 1996), 100-113.

Smout Allen, *Augmented Landscapes: Pamphlet Architecture* 28 (New York: Princeton Architectural Press, 2007), selections.

Columbia University Graduate School of Architecture, Planning and Preservation
A4104.004.2018: Studio IV; Spring 2018
Robert Marino Studio

"At the foot of this cliff a great ocean beach runs north and south unbroken, mile lengthening into mile. Solitary and elemental, unsullied and remote, visited and possessed by the outer sea, these sands might be the end or the beginning of a world. Age by age, the sea here gives battle to the land: age by age, the earth struggles for her own, calling to her defense her energies and her creations, bidding her plants steal down upon the beach, and holding the frontier sands in a net of grass and roots which the storms wash free. The great rhythms of nature, to-day so dully disregarded, wounded even, have here their spacious and primeval liberty; cloud and shadow of cloud, wind and tide, tremor of night and day. Journeying birds alight here and fly away again all unseen, schools of great fish move beneath the waves, the surf flings its spray against the sun."

Henry Beston, The Outermost House, A Year of Life on the Great Beach of Cape Cod

Montauk Land-Seabridge
Montauk, NY

Land-sea Bridge

The negotiation of the boundary between sea and land involves the architect in a complex battle in which she/he must necessarily take sides, or possibly remain neutral.
The work for the semester will involve the design of a public facility at an extraordinarily sensitive environmental juncture; the ocean beach in Montauk, New York.

Western View, Montauk Beach, December 3rd, 2017

History

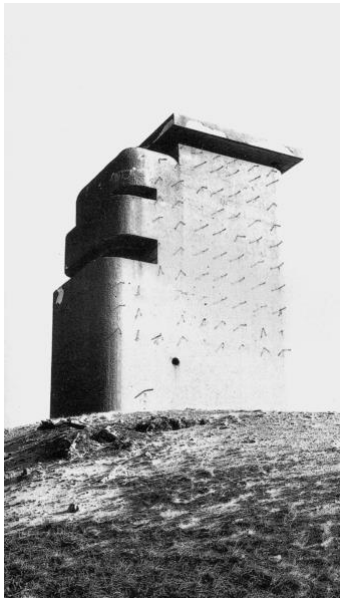
The eastern most end of Long Island has only just recently become a popular recreational adjunct of New York City. As was the case everywhere in the new world, it was initially a place to gain a foothold, a place for survival. Through most of its history it was a seafaring territory, most easily gotten to from Boston Harbor, Nantucket, Martha's Vineyard, or Cape Cod. It was land surrounded by the sea, yet blessed with very fertile alluvial soil. Its inhabitants were just as apt to be of the seafaring as well as the farming type, able to gain their livelihood as did their Native American forbears, through a balance of fishing and farming.

Things have changed. It is now a place primarily appreciated as being one of the last remaining natural environments within a 2-3 hour drive of New York City, and as such it is primarily a place of recreation. The tensions generated by change are evident. One of the most interesting current political discussions involves the theories of land use and preservation: How should the natural environment be used? How much of, and of what type of business establishments should be supported? Are there alternate uses of public land that are more in keeping with open space preservation?

The US Army Core of Engineers, as part of a much larger south shore reconstitution project, has built an artificial dune on the ocean beach in Montauk. It was, and is, a highly contested project on environmental, aesthetic, and political grounds. The dune has recently suffered considerable erosion and the ''bridges'' providing public access to the beach have been degraded and deemed unsafe.

Project

The ‘‘bridge’’ that encompasses an architectural program, is a well-known type. A ‘‘bridge’’ might encompass a healing method, showing an understanding of natural processes, or a defiant monument, seemingly impervious to the imperatives dictated by Nature. The ‘‘bridge’’ proposed in this studio is hopefully a poetic construct that can both respond to useful program and be instructive to the public.



German Artillery Bunker, Southern French Coast
Photo Paul Verilio

Andrew Geller, Fire Island House

Site: Ocean Beach, Montauk, NY

The land-sea bridge will be formed by a useful, necessary, and very public program: a youth recreation center. The costs associated for this public facility will be borne by the oceanfront businesses benefiting from the protective artificial dunes constructed by the US Army Core of Engineers. The bridge/recreation center will be located at one of the existing access points bridging the dunes.

The site is just west of one of the most popular surf beaches on the east coast, Ditch Plains, which because of its offshore rock floor, provides continuously breaking waves with predictable qualities. To the west, private oceanfront homes and hotels populate the beach to Heather Hills State Park. The park preserves lands across the entire breadth of the ''south fork'' of Long Island at this point, westward to the village of Amagansett where private ownership prevails.

Ocean Beach, Montauk, NY showing public access points

In many ways, our studio project concerns the evolution of change on eastern Long Island. In a continuum of constant change of use, how is the architect to balance her/his efforts towards new necessities? How can we negotiate between the Native American's distaste for the ownership of Nature, the pioneer's will to survive and conquer the environment, and an advanced capitalistic democracy's need to overlay Nature with commerce? The architect has the opportunity to choose a direction.

Research

Initial research for the semester shall include, but not be limited to:

The US Army Core of Engineers project to stabilize the south shore of Long Island

Dune movement as exemplified in "The Walking Dunes", (to be visited.)

The principles of marine architecture.

Boatbuilding methods and materials.

Method

Initial tactile research will be conducted concerning concepts required of bridging in an unstable medium.

A Short Reading/Viewing List:

McPhee, John. The Control of Nature

Beston, Henry. The Outermost House

Mathiessen, Peter. Men's Lives

Thompson, D'Arcy. On Growth and Form

Columbia University Spring 2018
Graduate School of Architecture, Planning and Preservation
A6911 Urban Planning Studio
A4004 Advanced Studio IV
Richard Plunz, Architecture Critic
Douglas Woodward, Urban Planning Critic

GENOA, ITALY: NEGOTIATING FRAGMENTS

"The galleys laden with chests of reals or ingots in fabulous quantities in the 1570's. . . made Genoa the arbiter of the fortune of the whole of Europe."
Fernand Braudel, Civilization and Capitalism.15th-18th Century.

"We could see Genoa . . . and watching it as it gradually developed its splendid ampitheatre above garden above garden, palace above palace, height upon height, was ample occupation for us, till we ran into its stately harbour."
Charles Dickens, Pictures From Italy

TRANSITION

Genoa has reinvented itself many times. It is again in transformation. In the past, perhaps an apogee was reached in the 16th century. The historian of the Mediterranean, Fernand Braudel describes how, at that moment, together with Venice, Florence, and Milano, Genoa was dominant and unique (see "the Age of the Genoese" in Braudel's The Perspective of the World). Throughout its history Genoa has been particularly strategic given its extraordinary port which enjoys centrality within in the land mass of Western Europe. Today though diminished from its former importance, it still harbors the sixth largest container port in Western Europe.

In the 16th century, through moving of money and goods, the fortunes of the Genovese far exceeded its compact territory. Genoa re-emerged in the late 19th century as an industrial

powerhouse including manufacture of heavy equipment related to new land transportation modalities. Genoa is now in another transition and period of uncertainty, perhaps best symbolized by the transformation of its Old Port, once a global destination for shipping which is now a cultural destination dominated by Renzo Piano's Old Harbor project (2002-04). Perhaps most symptomatic of the city's uncertainties is the population decline, from 816,872 in 1971 to 588,668 in 2015. Yet given its extraordinary history, and given its extraordinary physical setting; it is the assumption of this studio that the apparent negatives of this present moment can in fact become positives; and the city will compete in the European and global context in new ways; reinventing itself as indeed it has done in the past. In some sense it remains today as Charles Dickens described it in the 19th century as "A bewildering phantasmagoria, with all the consistencies of a dream and all the pleasure of an extravagant reality!" (see Charles Dickens, Pictures from Italy, 1846).

GEOGRAPHY

Genoa enjoys an extraordinary geography, with its integral rivieras stretching along 19 miles to the east and west, and compact adjacent settlement constrained by immediacy of the Apennine Mountains. It is the region of the Ligurian Riviera and the *Cinque Terre* just to the southeast. It is one of the most extraordinary landscapes of Europe for its integration of natural environment and urbanism, and an intense relationship to its sea is unique. In Genoa most neighborhoods lie within a short walk to beaches and nowhere more distant than a brief public transit ride. Genoa is the quintessential "compact city" in that throughout its history there has been no alternative but to build high, given its topographic constraints to sprawl. Within the city these constraints are further enforced by the difficult ravines and rivers that have not supported urbanization, dividing fragments or "islands" of density. This geography has developed unique settlement patterns over time, with fragmentation of neighborhoods due to natural partitioning. Today this geography is increasingly dominated by changes in global ecological factors including climate. The unique and intricate ancient infrastructure that developed the city is now experiencing new demands; for example, the changes in precipitation patterns that are overwhelming the river and rivulet systems that function to drain the mountains and serve the neighborhoods.

THE QUARTO SITE

This studio will address restructuring one such neighborhood; the area of the Quarto, which is east of the historic center. The area is well-connected with regional rail and metropolitan transit. The entire Quarto ensemble is of vital interest in that it represents one of the largest future redevelopment potentials in Genoa. It comprises four distinct fragments: beachfront; an adjacent waterfront neighborhood; an upper neighborhood dominated by a historic hospital complex; and the Sturla River which bisects everything. The large ravine of the Sturla River engages issues that are typical of the Genoa landscape. It is prone to flooding and has been canalized including high walls, which impede spatial and functional community linkages. At its mouth is the popular neighborhood beach created by the alluvial deposits from the river. The upper Quarto plateau is isolated from the beach front by topography and river channel. It is dominated by the historic "Old Psychiatric Institute" inaugurated in 1895. Its extraordinary nine-square plan designed by the architect Vincenzo Canette housed 1300 beds. It was expanded with the adjacent "New Psychiatric Institute" in 1933, doubling capacity. In 1978, laws governing psychiatric treatment were revised, leading to the semi-abandonment of the complex today. Another important fragment within Quarto is the Paul Klee High School for the Arts, also in question as to its future use. Yet another large fragment is the Gaslini Institute, one of the premier pediatric hospitals in Italy. It is a robust institution with a large public presence, but due to its isolation contributes little to the life of the Quarto community. Nearby is the Don Bosco Institute that does provide a number of community services inclusive of recent immigrants.

THE CHALLENGE
The study teams are asked to identify public policy and spatial design strategies at the overall Quarto community scale, while focusing on some specific areas at the building scale. Considerations will include economic and environmental sustainability within the history and spatial morphology of the city. Of particular importance will be considerations related to landscape connectivity. The new city administration considers that in spite of the potentials in Quarto, the substantial investment in its marginalized and abandoned sites will not be forthcoming without implementing spatial and programmatic linkages that can form a more unified critical mass within the fragmentary pattern. Our research will entail examining options for spatial connection; and for programmatic options that interconnect new uses with existing components. In this work we will be intimately engaged with the social challenge given by the newly elected Genoa Mayor Maria Bucci: *"We want Genoa again to become a big city - the capital of Mediterranean. We'll never be able to if we don't put ourselves in the perspective to have a functioning social system able to guarantee a high quality of life"*

STUDIO ORGANIZATION
This studio seeks to combine both architecture and urban planning students in a joint project to their mutual interest while providing a unique resource for making crucial planning decisions in a city that is important to the future of European urbanism. While many tasks will be shared, it can be anticipated that the urban planning students will specialize in the aspects of the project brief more related to political economy; architecture students will specialize in the more spatial aspects of the project brief. The Columbia team will work in collaboration with their peers at the Department of Architectural Science at the University of Genoa. The client is the Office of the Mayor. Below is a summary of major issues to be addressed as outlined by the client.

COURSE ORGANIZATION
The course will accommodate both the Urban Planning Studio and the Architecture Studio formats. Presentations on various research and design progress will be held every Thursday as per the below schedule. Joint project development will be emphasized inclusive of both planners and architects, roughly following challenges related to political economy and spatial structure. Participants should be keen on the topic, be willing to work hard, and be enthusiastic collaborators. With inclusion of both planners and architects we should have a well-rounded skill set. By Mid-Semester analytics will be completed to the extent that schematic spatial proposals can be advanced for presentation in Genoa. As well, exchanges with a Genoa University team throughput the semester will further issues and options, with the work of both the Columbia and Genoa teams in sync.

COLLABORATORS
This studio is made in collaboration with the University of Genoa (Università degli Studi di Genoa) and the Municipality of Genoa (Commune di Genoa). A preliminary studio focused on the Quarto for Italian students in Genoa will commence in October 2017. This first semester by the Genoa team will mainly focus on site analysis and identification of policy and design strategies. The Columbia studio will start in January 2018. A joint workshop will be organized from March 12 - 16 in Genoa, joined by the students and faculty from both universities, and with a joint report be published at the end of the academic year.*

Principal faculty collaboration at the University of Genoa will be with:
Professor Katia Perini, Architectural Engineer, Department of Architectural Science, University of Genoa
Professor Adriano Magliocco, Architect and Urban Planner, Department of Architectural Science, University of Genoa
Professor Paola Sabbion, Landscape Architect, Department of Architectural Science, University of Genoa.

Principal coordination with Genoa municipal authorities will be with:

Marco Bucci, Mayor, City of Genoa
Simonetta Cenci, Urban Designer, Director of Urban Planning, City of Genoa

*Additional Report Development may ensue in Summer 2017, with support from the City of Genoa.

USEFUL FIRST READINGS

Fernand Braudel, Civilization and Capitalism. 15th-18th Century. The Perspective of the World. London: Collins, 1981. "The Age of the Genovese."
The 16th century city placed in its global context.

Charles Dickens, American Notes & Pictures from Italy. London: Chapman & Hall, 1907. "Genoa," pp 277-309.
Description of 19th century social and spatial diversity of the city.

Genoa Urban Lab, Quederno nos. 1 and 2. December 2008, June 2011.
A report on present-day strategic planning options for the City of Genoa.

RE GOA Workshop. RECYCLE GENOA. Fondazione Mies van der Rohe, Mediterranean Cities Program. 2012. PDF.
Summation of studies on next generation development in the City of Genoa.

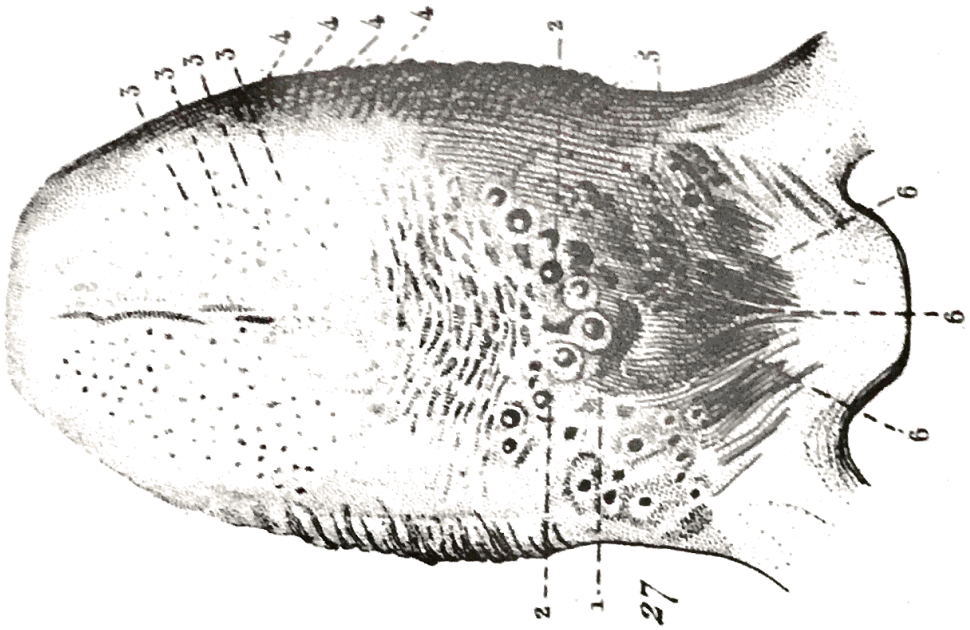
V. Pizzigone, V.Scelsi (eds.), Psychiatric Hospitals. Genoa: Araldica Edizioni, 2015. <http://www.valterscelsi.it/images/SSG_15124_affiancate_250.pdf> *A summary of research on the Quarto Psychiatric Institute complex including history and attempts at reuse.*

TENTATIVE COURSE SCHEDULE

Week 1 Architecture STUDIO LOTTERY Wednesday, January 17
FIRST STUDIO MEETING Thursday, January 18
Week 2 RESEARCH DEVELOPMENT Thursday, January 25
Week 3 RESEARCH PRESENTATION (history and morphology) Thursday, February 1
Week 4 DESIGN PROBE PIN-UP (linkages) Thursday, February 8
Week 5 DESIGN RESEARCH PRESENTATION Thursday, February 17
Week 6 SITE PROPOSITIONS Thursday, February 22
Week 7 MIDTERM REVIEW Thursday, March 1
Week 8 Genoa SITE VISIT Monday, March 5 - Friday, March 9
Joint Workshop with Genoa Students and presentation to Mayor and City Council
MIDTERM WEEK March 12-16
Week 9 SITE VISIT RECAP Thursday, March 22
Week 10 POST-VISIT PROJECT DEVELOPMENT Thursday, March 29
Week 11 POST-VISIT PIN-UP Thursday, April 5
Week 12 POST-VISIT PROJECT DEVELOPMENT Thursday, April 12
Week 13 PRE-FINAL PIN-UP Thursday, April 19
Week 15 FINAL REVIEW Wednesday, April 25
Week 14 DRAFT REPORT REVIEW Thursday, April 30

Columbia University GSAPP
A4104 Advanced IV Scales of Environment Studio Spring 2018
Critic: Lindy Roy

THE TERROIR PROJECT: Cooking the Urban Landscape



"Cooking does not take place in the kitchen, it takes place in the landscape."
Dan Barber, *Blue Hill Stone Barns*

Overview:
What does cooking have to do with architecture? **If cooking means any process that gathers materials and especially *qualities* from the environment and - through various operations - brings them to expression**, can we say that if we approach design like a chef approaches her craft, we can open up new ways to think about environment, sensation and form?

Food is a *keystone practice* in our culture. It connects our most urban *and* cultural *and* somatic *and* sensate selves to the natural world. Cooking as a *radical design practice has the 'unique capacity to engage both urban and natural realms simultaneously'*. This studio proposes that our working definition of cooking has the potential to expand and redirect how we think about environment and society and what we're *actually* doing when we design.

“Eating and perception are perhaps not so different things—each is a form of capturing information from our ambient universe, a process that is completed only once a primary material is transformed into something new. How is pertinent, interesting, or useful information stored in the world and how do we harness it to produce both knowledge and form? These are the problems of ecology and ecological thought.”

Sanford Kwinter

Terroir is a term traditionally used in wine producing culture to designate the *totality* of multivalent and multi-scalar factors contributing to the qualities of the wine. These include but are not limited to climate, soil, harvesting techniques, history, geography, local traditions etc. We will extend this term broadly and radically to refer to *every* aspect of *every* element at every scale in a final assembly - be it a **building, an object or an experience**.

The Projects:
The studio begins with a two-part intensive research phase (Projects 01 and 02) followed by a design proposal (Project 03) for a new kind of urban learning institution, an integrated food-cooking-social-urban-ecology-based enterprise: a cultural anchor for the new urban reality. The specific programmatic drivers for individual design proposals will be developed by students during the research phase.

Project 01: a deep dive into the radical practices of chefs including: Heston Blumenthal, Rene Redzepi, Alex Atala, Alice Waters, Jose Andres, Ferran Adria, Dan Barber, Hiroyuki Terada, Grant Achatz, Gaggan Anand and Susir Lee among others. It is notable that once many of these chefs achieve notoriety through their exclusive restaurants where extreme culinary experimentation and sensorial stimulation are precisely calibrated to delight or shock the nervous systems of individual patrons their focus often expands to broader urgent social, political and environmental issues impacting and impacted by food.

In Project 02 We will identify and explore the cultural, biological, scientific, historic, geographic, atmospheric, climatic and technical factors that contribute to a range of culinary/sensory products and processes including fermentation, distillation, brewing, affinage, wine, cannabis, chocolate and tea.

The Sites:
Students will select one of two New York City sites for their design proposal (Project 03). One site has river access, the second site invites engagement with the water table.

Schedule
Midterm Review: March 1
Final Review: April 26
A detailed pin-up and presentation schedule will be for the semester will be posted online.

Studio References

Richard Wrangham, *Catching Fire: How Cooking Made Us Human* (Basic Books: 2009)

Thich Nhat Hanh, *How To Eat* (Parallax Press:2014)

Ian Tattersall and Rob Desalle, *A Natural History Of Wine* (Yale University Press:2015)

Wolfgang Schivelbusch, *Tastes Of Paradise* (Vintage Books: 1993)

Daniel Lord Smail, *On Deep History and the Brain* (University of California Press: 2008)

Soshitsu Sen XV, *Tea Life, Tea Mind* (John Weatherhill Inc.: 1979)

Michael Pollan, *The Botany Of Desire* (Random House: 2002)

Dan Barber, *The Third Plate* (Penguin Press: 2014)

Studio Olafur Eliasson, *The Kitchen* (Phaidon)

Questlove, Something To Food About (Potter: 2016)

F.T. Marinetti, *The Futurist Cookbook* (Trefoil Publications Ltd: 1851)

Carlo Petrini, *Slow Food* (Columbia University Press: 2003)

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Lizzie Collingham, *Curry: A Tale Of Cooks And Conquerors* (Oxford University Press: 2007)

MKF Fisher, *An Alphabet For Gourmets* (North Point Press: 1989)

Adam Leith Gollner, *The Fruit Hunters* (Scribner: 2008)

David Howes, *The Varities of Sensory Experience* (University of Toronto Press: 1991)

Andrea Wulf, *The Invention of Nature* (Vintage: 2016)

Alexander von Humbolt and Aime Bonpand, *Essay On The Geography Of Plants* (University of Chicago Press 2010)

John S. Allen, *The Omnivorous Mind* (Harvard University Press: 2012)