What's Next for Architectural History? Sustainability and the Architectural History Survey

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THE HISTORY SURVEY IN THE LAST TWO DECADES

Post-colonial theory has transformed the architectural history survey courses so as to depart from the Euro-centric canon.[1] The result has been that surveys have become more inclusive of "non-western" content, and acknowledge multiple temporal trajectories.[2] Revisionist surveys such as Ching, Jarzombek, and Prakash's *A Global History of Architecture* and Kostof's *A History of Architecture: Settings and Rituals* emphasize their departure from the canon.[3] While surveys are still struggling with the canon in terms of incorporating "non-western" content, we are likely to face a new wave of revisionist histories of architecture. The integration of sustainability into the architectural education has generated the next challenge for architectural history surveys. Schools are now being pressured to make architectural and urban surveys "green." In this paper I will reflect on two questions. First, how will we incorporate sustainability, a 1980s paradigm, into the architectural history curriculum? Second, how can we relate sustainability education in the design studio to the history of the architecture curriculum?

SUSTAINABILITY IN THE DESIGN STUDIO

The discipline of architecture has absorbed the discourse of sustainability largely through the design studio curriculum. In the design studio, our unsustainability is seen as a design problem, which is addressed by performance-based, solution-driven approaches such as Cradle to Cradle, LEED, Ecological Design, and Zero-carbon buildings.[4] These performance-based paradigms operate through empirical measures, such as energy consumption, greenhouse gas emissions, resource management, life cycle assessment, indoor air quality, and waste management. A range of neologisms, such as Eco-technic, Eco-centric, Eco-aesthetic, Eco-cultural, Eco-medical, and Eco-social, are used to locate buildings on the environmentalist spectrum.[5] Design studios emphasize the problem-solving approach, where design is expected to provide the solution to the problem of our unsustainability. However, none of these solution-driven approaches adequately address the cultural, social, moral, and ethical aspects of sustainability. Environmental humanities might be one way to engage with the humanistic aspects of sustainability. To that effect, the architectural history survey can be a potential forum through which architectural education might be able to engage with environmental humanities.

At a recent workshop called the Prairie Project organized at the University of Florida on incorporating sustainability into higher education, I was asked how I would sensitize students at the School of Architecture at the University of Florida to the complexity of solving the unsustainability of our lifestyles. I proposed two solutions: first, a feasible one, and second, one that would not be allowed by any American university. My second solution, the unfeasible one, was to send students to an urban slum in Mumbai, India. They would have to survive in the slum for two weeks without any of their possessions, except for the clothes that they were dressed in. They would have to find food, work, a place to live, and the means to protect themselves: pure survival. Of course, no university would allow this kind of a project, as it might jeopardize the student's life.

The first solution that I proposed was feasible. I designed an assignment in which all students in the studio, prior to beginning the design exercise, would be required to write a long, detailed essay on what they had consumed in the past twenty-four hours. In other words, they would have to keep a consumption diary, like dieters counting calories. They would then be required to quantify what they had consumed in terms of materials and energy. Subsequently, they would have to trace the origin of each and every material they had consumed; where it came from and how it was acquired; and the political, economic, and environmental costs of each component of every object, including the metals used in their smartphones, the paper used in their coffee cups, the water that they used, the food that they ate, and all of the gas that was used in getting them the products that they touched within the last twenty-four hours of their lives. The last step in the exercise would be for them to estimate when those materials and energy will run out in the future and how fast the materials would run out if every person on the planet lived the same lifestyle as theirs. They would have to determine not only whether their rate of consumption will be possible for future generations to sustain, that is, the longitudinal temporal aspects of sustainability, but also the lateral temporality of their consumption habits.

This exercise is designed to introduce them to the Brundltland definition of sustainability, which calls upon us to maintain lifestyles that do not compromise the ability of future generations to meet their lifestyle needs and at the same time to ensure equity in the current world.[6] In other words, the temporality of the concept of sustainability lies in the present and the future. That poses a challenge for us instructors teaching the history of architecture. How do we discuss Classical Greek architecture and 1980's paradigm of environmentalism such as sustainability in the same class?

SUSTAINABILITY AND ARCHITECTURAL HISTORY

In order to understand how we can incorporate sustainability education into the history of architecture survey, we need to address the question of how sustainability can be framed in the history of architecture survey and in seminars on architectural history.

First of all, if we as architectural historians are to engage students with sustainability, it is important to integrate environmental histories and historical ecologies into the architectural history survey. It is not enough simply to transfer contemporary sustainability design paradigms like LEED, Cradle to Cradle, and Zero-carbon buildings to historic buildings such as the Parthenon; we must also teach the history of architecture within the broader context of environmental history and historical ecology. I propose that a history of architecture survey that incorporates environmental histories and historical ecologies will enable students to historicize sustainability. By grasping the relationship between architecture and environment through history, students are likely to gain a better understanding sustainability from humanistic perspective.

Second, it is important to recognize that the unsustainability of our lifestyles is not an unprecedented problem. The environmental collapse and decline of civilizations is nothing new. If all past civilizations were sustainable, the Roman and Mayan civilizations would still exist. We need to pay more attention to wars fought for natural resources and to the collapse of civilizations through the lens of environmental history.

Third, it is important for students taking undergraduate history survey courses to understand that sustainability is *only* one paradigm of environmentalism. Several paradigms of environmentalism have existed since antiquity, and framing sustainability in the context of a history of environmentalisms is crucial.

REVISIONIST HISTORIES: THE DISCIPLINARY BOUNDARIES OF THE ARCHITECTURAL SURVEYS

Incorporating sustainability into the architectural survey will necessitate the production of revisionist architectural histories that are refracted through an environmental lens and are able to establish a dialogue with sustainability education in the design studio. These revisionist histories will occupy the disciplinary territory that is produced by the intersection of architectural and environmental histories. In the following section, I will define the body of knowledge that lies at the intersection of architectural and environmental histories.

J. Donald Hughes defines environmental history as human history through an ecological lens.[7] Environmental history is an emerging discipline that faces the daunting task of unifying ecological histories, societal formations, histories of technology, and cultural histories into a unified narrative.[8] The discipline of architectural history originated from that of art history and incorporated cultural histories, urban histories, and the histories of technology. Architectural history surveys cast architecture and cities as cultural artifacts, whereas environmental histories treat the built environment as an ecosystem. There are a handful of architectural histories that intersect with the environmental histories, and they mostly focus on the twentieth century.[9] The only environmental survey is Reyner Banham's, *The Architecture of the Well-Tempered Environment*, but that is written from the perspective of environmental design of buildings, that is how buildings became more and more complex in terms of the design of their inodoor climate.Ironically, in the introduction, Banham remarks that librarians find it hard to categorize his book, and they often (mis)place his book in the "Introduction to Technology" section. We might see more scholarship in the field of enviromental histories of architecture in the next few years.[10]

For the purposes of this paper, I'll begin with the definition of environmental histories of the built environment that has been advanced by urban environmental historians such as Joel Tarr and Martin Melosi. They define the environmental histories of the built environment as the histories of human interaction with nature through architecture and urbanism, that is, how humans have responded to the environment through architecture and urbanism and the impact of human architectural and urban interventions on the natural environment.[11]

The major history of architecture survey textbooks, such as *A Global History of Architecture*; *A History of Architecture: Settings and Rituals; Architecture, from Prehistory to Postmodernity*; and *Buildings across Time: An Introduction to World Architecture,* describe how civilizations have responded to the natural environment through architecture and urbanism as transformations of the natural environment.[12] These histories emphasize a formal reading of architecture and incorporate cultural histories to construct a narrative that is based on the "golden age" temporalization of each civilization. However, these architectural surveys are silent on the impact of architecture and urbanism on the natural environment, the environmental decline of civilizations, and the history of environmentalism. This body of knowledge that deals with the impact of human architectural and urban interventions on nature has traditionally been the territory of environmental historians, who view the city as a "structured human relationship with the natural environment."[13]

In the early 1990s, urban historians interested in environmental histories of cities created a disciplinary territory for themselves by pointing out that environmental historians had not given enough space to the city in the discipline of environmental history, which was dominated by the Worsterian "agroecological" perspective.[14] While the field of urban environmental history has matured since then to produce a significant body of work, the field of architectural environmental history has yet to realize its full potential. Architectural histories have not embraced environmental histories to the extent that we can define a field of architectural environmental history. Urban environmental historians have overcome the nature-culture split in treating cities as urban ecosystems and producing histories that do not compartmentalize built and natural environments, architectural histories by and large continue to occupy the terrain of art history and cultural studies.

In order to incorporate sustainability into the architectural history survey, we face the dual task of locating the discourse of sustainability in environmental histories of architecture and overcoming the schism between the built and the natural environments. In order to establish a dialogue with design studio culture that is focused on sustainability, architectural history surveys will have to open up room for discussion on topics such as acquisition of building materials, climatic design, water management, energy consumption, social equity, environmental problems, climate change, and the environmental decline of civilizations.

Most surveys are fairly comprehensive in addressing the use of building materials in construction. But how were these materials acquired? What was the environmental impact of extracting them? We never get any sense of how much firewood was used in the Indus Valley cities to produce baked brick, and what the impact of that energy consumption was on forests. At what point did the Indus valley cross the threshold of sustainability? Take the

case of Greece. Most textbooks illuminate the relationship between architectural form and the transition from timber to stone in Greek architecture. But what were the environmental reasons for this transition? As architectural historians, we discuss neither where the timber and stone originated nor the ecological impact of consuming these materials. We rarely ask in the history of architecture class questions such as: How did the Greeks alter their ecosystem through their architecture and urbanism? Ecological histories cover the impact of Greek consumption of timber and its environmental consequences in terms of deforestation, soil erosion, and the introduction of malaria.[15] But Greek environmentalism about deforestation is largely absent from architectural history surveys.

Let us take the case of the Romans, who are cast as the greatest engineers of the pre-modern world in the history surveys. The Romans are acclaimed for their achievements in the sphere of infrastructural projects, such as roads, bridges, aqueducts, and sewers. However, we don't really discuss the environmental impact of the Roman civilization in terms of deforestation, air pollution, excessive consumption of water, water pollution, lead poisoning, soil erosion, and the extinction of animal species in imperial Rome that they used for entertainment in their amphitheaters.[16] In a design studio culture, where zero-carbon buildings are also being designed to support biodiversity to provide shelter for bats and birds, the architecture surveys tend to be silent about the Roman cruelty to animals and buildings which were designed to create a spectacle out of the exploitation of animals.[17] Most history surveys narrate how the Romans used construction materials such as marble, tufa, travertine, and bricks, but lack information on how these materials were extracted and produced by slaves. We tend not to dwell on the ecological impact of quarrying, mining, and construction in the survey.

By excluding the body of knowledge that illuminates the environmental cost of architectural and urban processes from the history of architecture, we, as history teachers, help to perpetuate the idea that environmental problems are uniquely modern phenomena associated with the Industrial Revolution and the rise of capitalism. The history surveys never mention the possible environmental factors in the collapse of the Western Roman Empire, and thus fail to correct the false assumption that the environment was never a concern till the twentieth century.

Architectural histories treat architecture and urbanism as design responses to the physical environment in terms of climate, topography, water sources, and building materials. In the history survey, we tend to teach about water only when we come across an architectural structure like a stepped well or an aqueduct. Let's take the case of the Greeks. Architectural surveys focus extensively on the experiential and ritual aspects of the Athenian Acropolis and the use of topography in locating the sacred center of the city. [18] In the architectural history survey, Greek urbanism is typically cast in terms of its morphology as organic, scenographic, and gridded, with Athens, Pergamon, and Priene as classic examples of each kind of urbanism. But surveys pay little attention to how the Greeks managed their water through karst, a geological limestone formation, and the relationship between karst and urbanism. When water acts upon karst it results in features such as sinks, ravines, and subterranean water channels.[19] The Greeks were skilled in their knowledge of using karst channels below the surface of the ground as natural pipelines, and springs as water sources.[20] But we don't include Greek water management in teaching Greek urbanism.

Let's take the case of Roman aqueducts. We routinely discuss the pollution of the Tiber due to waste discharge and hence the need for the construction of aqueducts.[21] If we look at Kostof, the aqueducts are eulogized as an expression of arcuated construction. Kostof mentions that the water was delivered through aqueducts to reservoirs and distributed through lead pipes, but does not mention that lead poisoning was an environmental health problem in Rome.[22]

Consider the case of Tikal and water management. The surveys focus on Tikal's spatial layout in terms of its plaza, pyramids, platforms and their impressive scale, but fail to mention how Maya in Tikal collected rainwater and stored them in reservoirs and how water collection determined the city layout.[23] The water management of Tikal falls into the disciplinary realm of environmental science, and thus we might have to turn to a journal like *Science* to understand how the Maya collected rain through catchment areas into reservoirs. Not only can the water management in Tikal offer us useful insights into water management

through rainwater harvesting, but also the centralized control of water can illuminate the social and political urban structure of Tikal.[24]

The study of water management and its societal impact can be used to raise fundamental questions such as: Why is it important to have an equitable distribution of resources such energy and water? What happens to societies when water becomes scarce? While we may not be able to teach contemporary water conflicts through the history survey, but we can certainly equip our freshmen to ask relevant questions such as, what role did water distribution play in the survival of civilizations?

As we run the risk of running out of water with our disappearing glaciers, water management has become an integral part of sustainable architecture in studio culture. One of the ways in which the history survey can establish a dialogue with design studio is to raise relevant humanistic questions that address water consumption and management.

A crucial gap in the current surveys is the lack of space devoted to the environmental decline of the civilizations that perished. We have to turn to environmental histories to learn about the decline of Rome, which might have been due partly to Romans' unsustainable lifestyles, which involved excessive consumption of natural resources.[25] Likewise, we tend not to address the Mayan collapse in relation to environmental factors, like increased pressures on Mayan agricultural resources to feed an excessive population, as well as high demands on forests for fuel.[26]

One of the most common misconceptions that students bring to my architectural history class is that everything prior to the Industrial Revolution was sustainable and that environmental problems are a result of modernity. Architectural environmental history surveys would have to address the problem of historicizing sustainability as far back as the Neolithic settlements. Sustainability is currently the dominant mode of environmentalism. However, civilizations throughout history have had their environmental problems, which they have addressed through their own ideas of environmentalism. In the case of the Greeks, such an idea might have centered on concerns over deforestation. For the Romans it might have focused on pollution and constant flooding of the Tiber. But how many of us have ever given our students an assignment that makes them read Vitruvius for evidence of environmental health problems like pollution or toxicity? Through the architectural survey, we might be able to include a hidden curriculum, one that gently leads our students to understand that environmentalism did not begin with Rachel Carson. That means that the survey will include climate change throughout history, equitable consumption of resources, pollution, deforestation, environmental health problems, shifting watercourses, and all the environmental problems that have made cultures and civilizations think about their environment.

There are many challenges to producing and teaching revisionist environmental histories of architecture. Environmental history is an emerging field, and there isn't enough scholarship on the period before nineteenth and twentieth centuries. There aren't enough environmental histories of architecture. Writing histories of architecture from an environmental perspective will require drawing upon science, ecology, history of technology, and environmental histories, as well as a different kind of training for architectural historians. It will require collaborations between people trained as architectural historians and environmental historians. The biggest challenge is the monumental task of being able to absorb all this new knowledge into a two-semester survey.

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ENDNOTES

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8 Richard White, "Environmental History, Ecology, and Meaning," *The Journal of American History* 76, n. 4 (1990), 1111-16.
9 Reyner Banham, *The Architecture of the Well-Tempered Environment* (London; Chicago: Architectural Press; University of Chicago 1973). Although Adam Rome's book on suburbia belongs to the category of urban environmental history, the second chapter in his book, "From the Solar House to the All Electric Home" is required reading in my class on the History of Sustainable Architecture. See Adam Ward Rome, *The Bulldozer in the Countryside : Suburban Sprawl and the Rise of American Environmentalism*, Studies in Environment and History (Cambridge; New York: Cambridge University Press, 2001).
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24 Vernon Scarborough, L. and Gary G. Gallopin, "A Water Storage Adaptation in the Maya Lowlands," *Science* 251, n. 4994 (1991), 658-62.
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26 Ibid., 47. See Robert S. Santley, Thomas W. Killion, and Mark T. Lycett, "On the Maya Collapse," *Journal of Anthropological Research* 42, no. 2 (Summer 1986), 123-159.