Columbia University
Graduate School of Architecture, Planning and Preservation
A4104-3: Advanced Studio IV, Spring 2020, “Scales of Environment”
Critic: Lindsey Wikstrom (lmw2167@columbia.edu)

Fringe Timber: *A Wildland Urban Intermix Laboratory School*

The Timber Innovation Act, passed in late 2018, as part of an agricultural improvement bill, outlined new initiatives for research and development of engineered timber, launching investment in construction projects and subsequent supply chains.[1] The goals are to lower the carbon footprint of construction, which is currently responsible for around 50% of the world’s greenhouse gas emissions, and provide jobs in rural economies. Silviculture, fast growing forests, and genetically modified trees have the potential to generate new sources of renewable income similar to other agriculture landscapes. But in contrast to monocultures in the Midwest, a diverse appropriately scaled timber economy advocates for forests to be kept as forests, slowing fringe development and encouraging urban density. The International Building Code is also preparing to publish new regulations in 2021 that represent the high performance of engineered timber, raising building heights to 18 stories and confirming its fire resistance that, in some cases, rivals steel.

In Europe, the industry has been steadily growing since the 90s. More timber products have emerged including NLT, DLT, GLT, LVL, MPP, LSL, OSL, PSL, MHM, and WLT to increase the speed of construction, improve quality of buildings, and offer a more resilient strategy as the population increases. On the West Coast of North America, engineered timber is similar in dimension and species to that of Europe, utilizing softwoods like douglas fir, spruce, and pine. However, the variety of hardwood trees and forest fragmentation on the East Coast present a different set of characteristics and proportions: it is stronger, thinner, and lighter than its softwood counterpart.

[1] Agriculture Improvement Act of 2018, H.R. 2-9, 115th Cong. ss 8641-8644.

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Historically, logging in the Adirondacks and Catskills provided the necessary construction materials for railroads and the Hudson Valley industrial towns of the 19th century. And although some logging efforts were clearly destructive, the romanticization of the landscape by the Hudson River School played a role in reframing the material flows of timber as undesirable, excluding it from other pastoral forms of land occupation. This form of representation initiated waves of forest conservation, pushing the industry elsewhere, inviting tourism and furthering the division of land for private ownership. Over the course of the 20th century, material processing was almost completely diverted to the East and Global South, crystallizing real estate speculation as the driving force of urban economies in North America.

Today, New York State has the highest volume of live trees in the country.[2] Most of the forest in New York (around 80%) remains privately owned, intermingling with development as Wildland Urban Intermix (WUI). In this current context, timber is still harvested out of economic necessity. Following the downturn of the Great Recession and the closing of large processing plants, mobile sawmills have struggled to serve as an outlet for landowners, thinning their forests to keep them productive and profitable. But as outlets disappear, and the influx of exurbanites grows, there is less support against deforestation for farming and urban fringe development.

Through a brief case study analysis, the studio will begin by collectively studying timber and the spatial conditions required throughout its lifespan, including forest management, circulation routes, sawmills, assembly and disassembly. Following this analysis, the studio will integrate these flows into the Town of Newburgh through an inventory of existing raw materials and investigation of infrastructural constraints. This sort of site analysis will result in a clear ecological proposal for the working landscape. With these flows in mind, the studio will interrogate the typologies of living laboratories and laboratory schools to develop a final project. The school will engage with the flow of material and should formally exhibit the potential of engineered hardwood, which will be explored through iterative physical models and prototyping.

Throughout all phases of work, the studio will explore uncharted points of view or forms or projection. Considering the influence of the Hudson River School, the studio will re-present material cycles, boundaries, automation, and rituals that might begin to provoke new cultural sentiment toward our relationship to the forest and to working landscapes.

NOTES

The semester will be organized into three phases:

1. Building a Material Story (1.5 weeks)
2. Material Flow / Site Analysis (1.5 weeks)
3. Laboratory School Proposal (10 weeks)

- The studio will meet for desk crits and pin ups on Monday and Thursdays from 1:30-6:30pm
- There will be weekly all-studio sessions on Wednesdays from 3:00-5:00pm
- A detailed schedule will be issued on 1/23
- Teamwork and collaboration are encouraged. Although students may work independently, teams of two are highly recommended.
- All studio work will be compiled into a book summarizing the studies and outcomes of the semester. Given the collective nature of the material research, it is expected that students coordinate their work into a shared template so that the knowledge can be presented coherently as a single body.

[2] Forest Inventory Data Online (FIDO), a component of the U.S. Forest Service Inventory and Analysis Program (FIA)

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READING

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Crary, Jonathan. *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*. Cambridge: MIT Press, 1990.

De Palma, Anthony. *“*Logging Is Part of a Plan to Preserve Adirondacks” *New York Times*, October 29, 2007

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Hudert, M. & Pfeiffer, S. *Rethinking Wood: Future Dimensions of Timber Assembly*. Basel: Birkhauser Architecture, 2019.

Iturbe, Elisa. “Architecture And the Death of Carbon Modernity.*” Log 47: Overcoming Carbon Form* (Fall 2019): 11-23.

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Martin, Reinhold. “Risk: Excerpts from the Environmental Division of Labor” from *Climates: Architecture and the Planetary Imaginary*. New York: Lars Müller Publishers, 2016: 349-360.

Morton, Timothy. *Being Ecological*. London: Penguin Books Ltd, 2018.

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Stamps, Laura. ‘Constant’s New Babylon: Pushing the Zeitgeist to Its Limits’ from *Constant New Babylon. To Us, Liberty*. Germany: Hatje Cantz Verlag, 2016: 12-27.

Revkin Andrew C. “Trying to Use the Saw But Spare the Forests; 80 Years Later, Logging Rebounds*” New York Times, November* 17, 1997.

VanderGoot, Jana. *Architecture and The Forest Aesthetic: A New Look at Design and Resilient Urbanism*. New York: Routledge, 2018.

Wallace-Wells, David. ‘Church of Technology,’ from *The Uninhabitable Earth: Life After Warming*. New York: Time Duggins Books, 2018: 171-184.

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PHASE 1
Building a Material Story
(1.5 weeks)

The studio will begin analyzing the lifespan of timber by drawing each value-add step with an interest in the spaces in which these processes occur. Each individual or team will identify one existing or historic case study facilities in North America or Europe. For all steps, the research and representation will elaborate on the relationships forged between natural resources, automation, and the human experience. Each step has innate physical and time-based scales of operation that are typically tuned to balance its target market and resource availability; but as a renewable resource, the steps of manipulating timber have the potential to be designed at new scales to be socially, economically, and environmentally resilient. Research will therefore consider the scalability of the step. Steps other than those listed below may be analyzed if found to be innovative (new or old) approaches to the manipulation of timber. Through this exercise, the drawings will combine to form a full material story for engineered timber, one that can be re-scaled and grafted locally onto the Town of Newburgh.

Step 1: Forest Management and Extraction Methods
Case Studies: West Coast Checkerboarding / Silviculture / Fast Forests / Balloon Logging

Step 2: Log Processing
Case Studies: Water-powered Sawmill / Wind-powered Sawmill / Electric-powered Sawmill

Step 3: Manufacturing and Off-site Assembly
Case Studies: Kattera / Structurecraft / Structurlam / Binderholz
Timber Product Types: CLT, NLT, DLT, GLT, LVL, MPP, LSL, OSL, PSL, MHM, WLT

Step 4: On-site Assembly
Case Studies: Mjøstårnet / Macquarie University Incubator / Wood Innovation Design Centre

Step 5: Use, Maintenance, and Weathering
Case Studies: Shoshugibon / Accelerated Aging Chamber / Fire Resistance

Step 6: Disassembly and Recycling
Case Studies: Gemeentehuis Brummen / Turntoo / Taisei Ecological Reproduction System

Minimum requirements for Monday, 02/03 pinup:

1. A 36” x 36” original drawing (printed) of the step that reveals its spatial system, organization and form. The drawing should be black and white, emphasize clarity, and combine different scales of information. Typical forms of projection should be challenged, but not at the cost of clarity. Consider methods that are useful for multi-dimensional description, including: plan, section, elevation oblique, perspective, and/or equirectangular projection.
2. A digital presentation which should include: the history of the step, the economic and physical context of the step, sensitive conditions of the step (weather, heat, energy, seasons), and adaptation or evolution of the step over time.