Teaching Animal Architecture: Pedagogy and Research Now

Claire Zimmerman
University of Toronto

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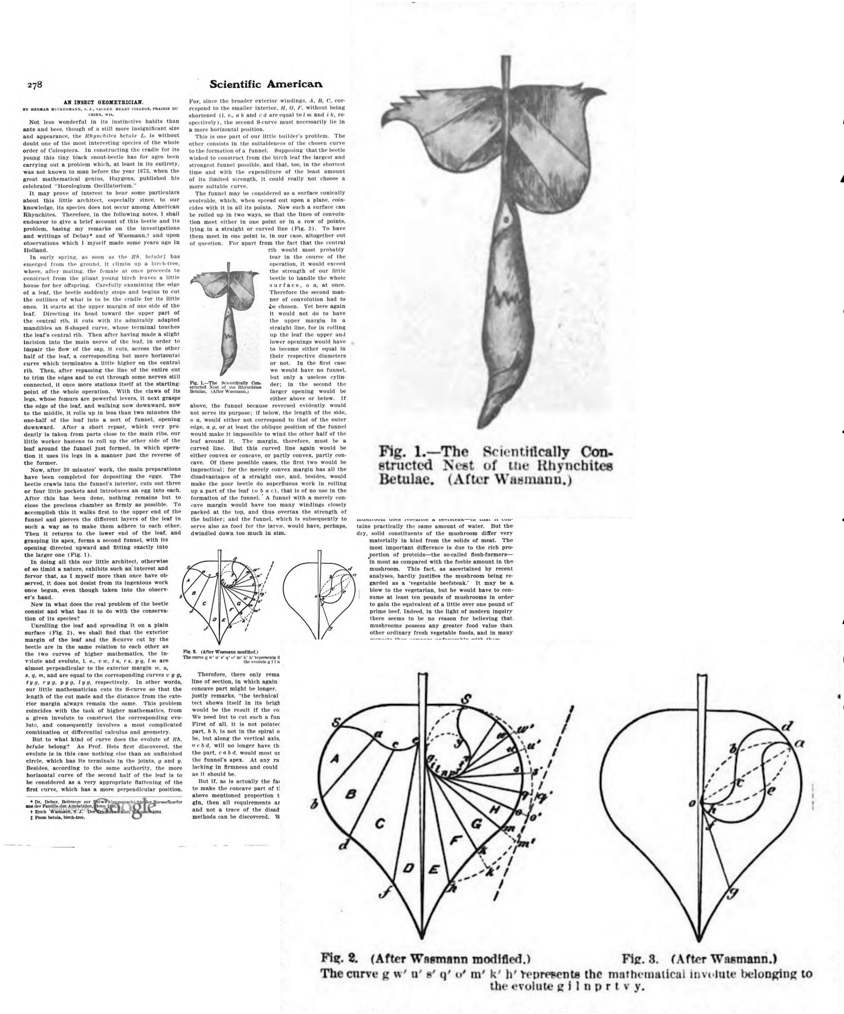
I. A disclaimer,
II. Two images,
III. Some disciplinary context,
IV. Ongoing pedagogical efforts related to the theme of the conference.

I. **DISCLAIMER: I am not an animal studies scholar (yet).**

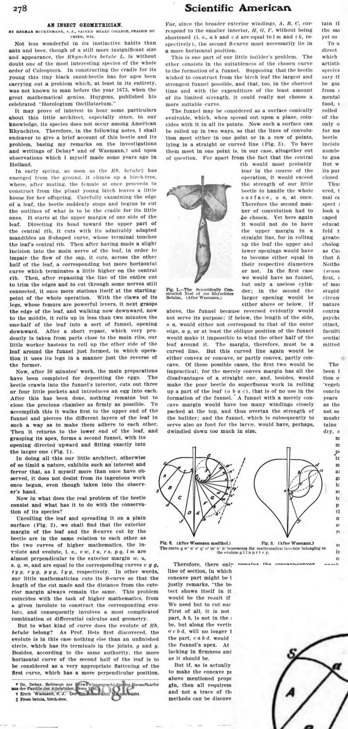
II. TWO OBSESSIONS



1st obsession: "An Insect Geometrician": *Rhyncites Betulae L.* (published in *Scientific American* April 19, 1902)

I came across this article as a was newly graduated architect, at a flea market in Florida. It became something of a *leitmotif* for me as I created a portfolio with which to hunt for a job. The portfolio itself was a hard shelled box covered in rice paper with the image on the left printed on its back; inside, thick white rag paper separated the pages that were all drawings printed on translucent vellum.

About 3 years ago, I came back to this image as I came to the conclusion that it was time to teach a class on animal architecture.



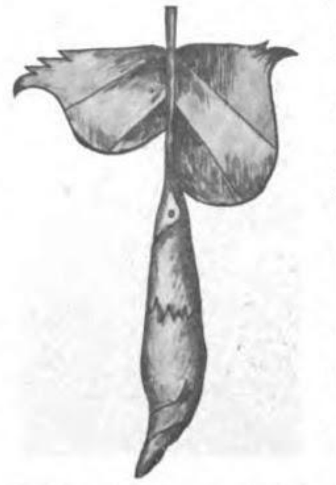


Fig. 1.—The Scientifically Constructed Nest of the Rhynchites Betulae. (After Wasmann.)

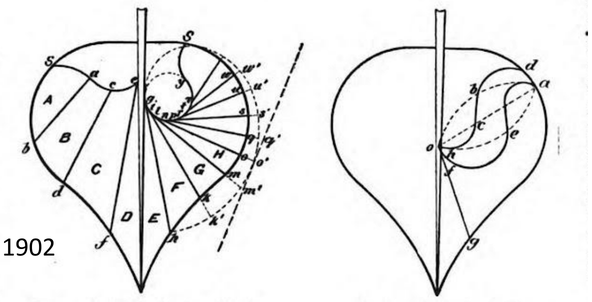


Fig. 2. (After Wasmann modified.) Fig. 3. (After Wasmann.)
The curve g w′ u′ s′ q′ o′ m′ k′ h′ represents the mathematical involute belonging to the evolute g i l n p r t v y.

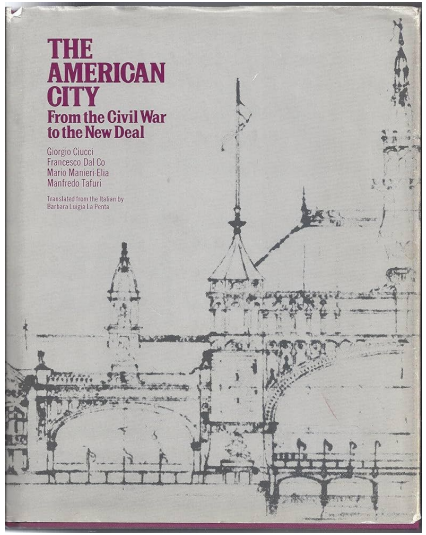
"An Insect Geometrician"
Scientific American April 19, 1902

2nd obsession: Marx, architects, bees

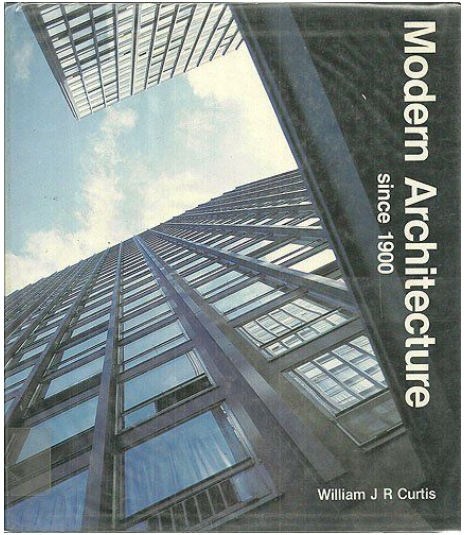
Marx: "We presuppose labour in a form that stamps it as exclusively human. A spider conducts operations that resemble those of a weaver, and a bee puts to shame many an architect in the construction of her cells. **But what distinguishes the worst architect from the best of bees is this, that the architect raises his structure in imagination before he erects it in reality.** At the end of every labour-process, we get a result that already existed in the imagination of the labourer at its commencement. He not only effects a change of form in the material on which he works, but **he also realises a purpose of his own** that gives the law to his modus operandi, and to which he must subordinate his will."

III. Recent history of architectural history: why animal studies now?

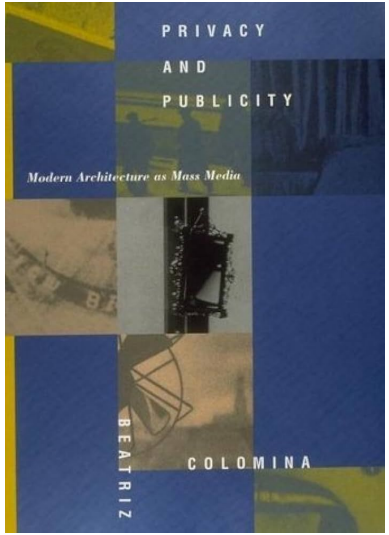
III. Recent history of architectural history: 1980s and 1990s revisionist history



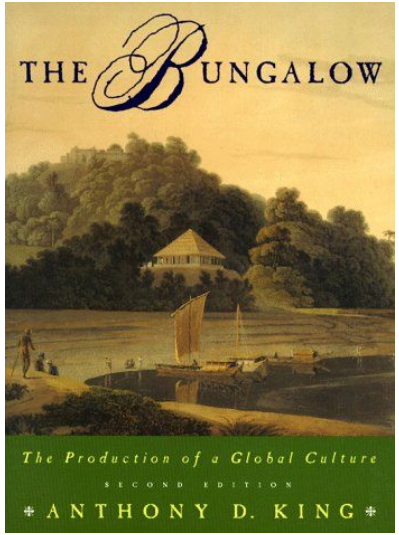
1980



1983



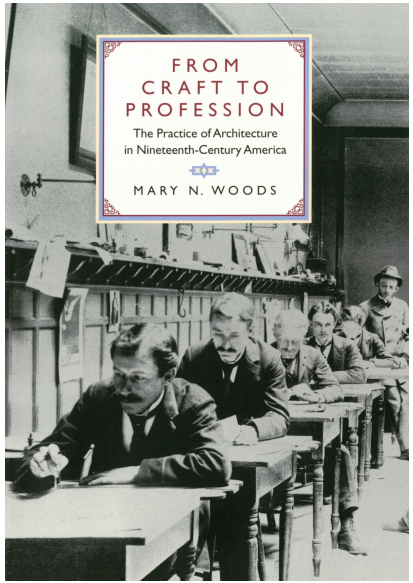
1994



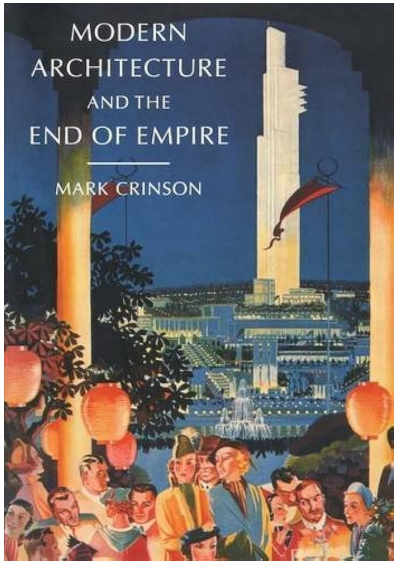
1995

1980s and 1990s: revisions of late modernist "operative history" in new, archivally based histories; concern with neglected histories of the built environment such as those associated with subalterns;

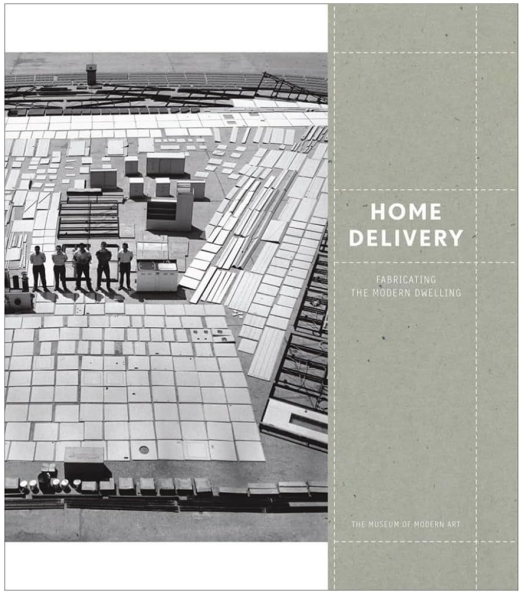
Recent history of architectural history: 2000s greater articulation



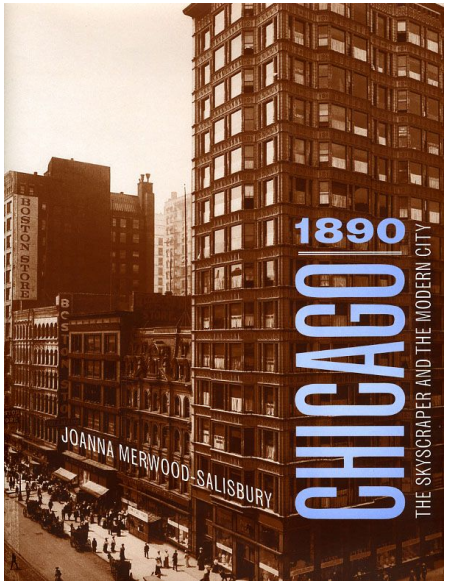
1999



2003



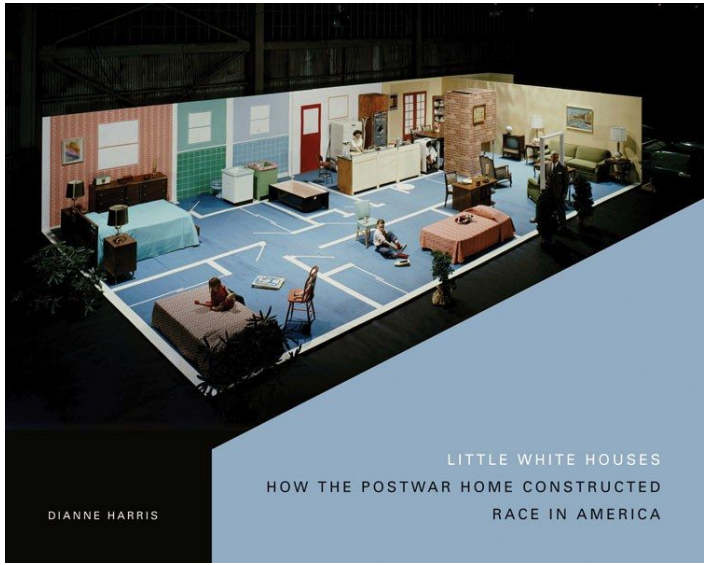
2008

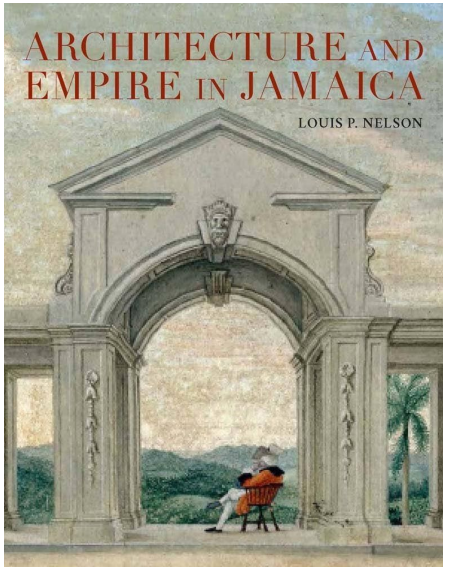


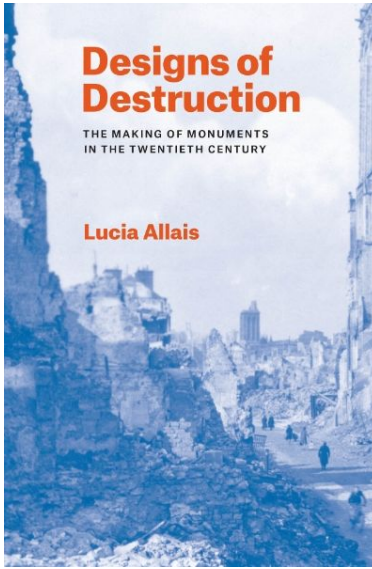
2009

2000s: articulation of those new revisionist histories; and expansion into previously neglected histories, particularly postcolonial and race-based;

Recent history of architectural history: 2010s writing history with architecture



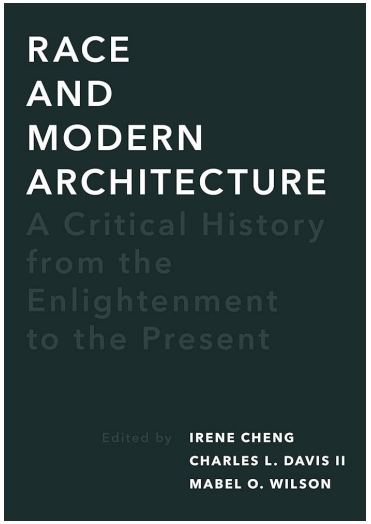




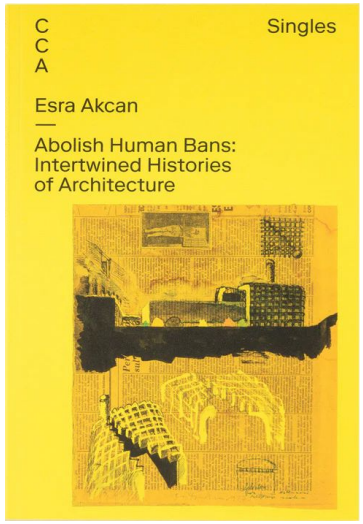
2012 **2016** **2018**

2010s: “writing history with architecture”--beginning to realize the capacities of the built environment to add substantively to historical accounts, in ways that texts and archives do not.

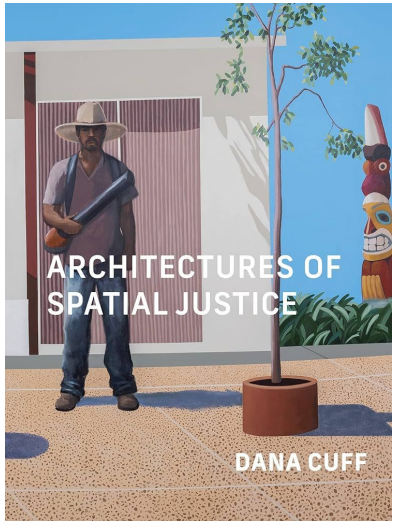
Recent history of architectural history: 2020s activism



2020

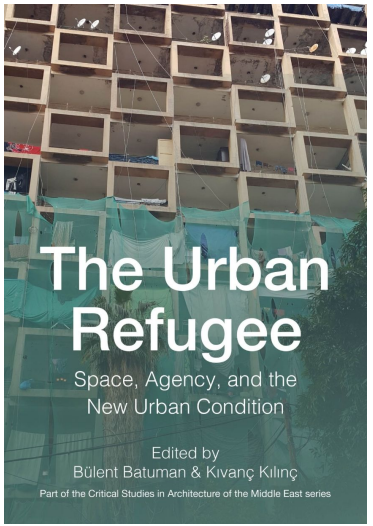


2022



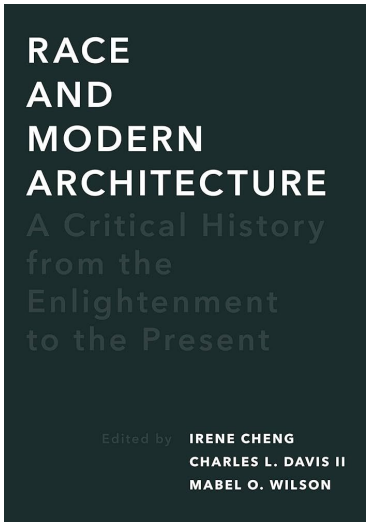
2023

2024

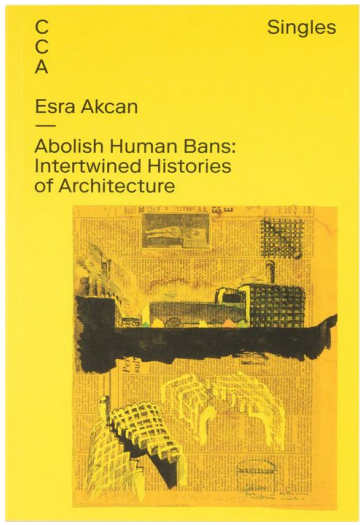


2020s: activating the knowledge acquired over the last thirty years; desire for greater connectivity between knowledge practices and social/ political change.

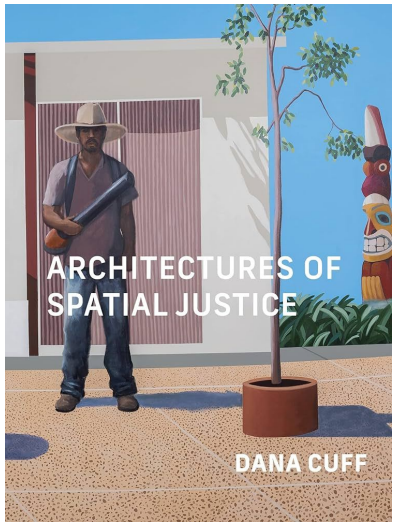
Recent history of architectural history: 2020s activism



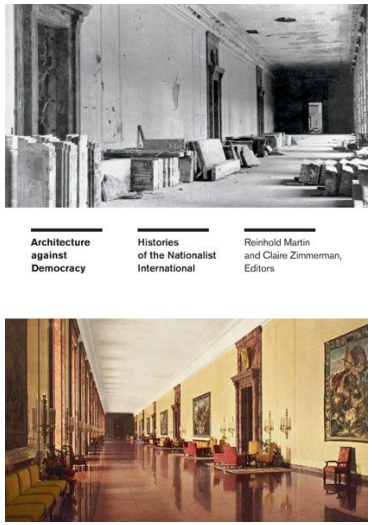
2020



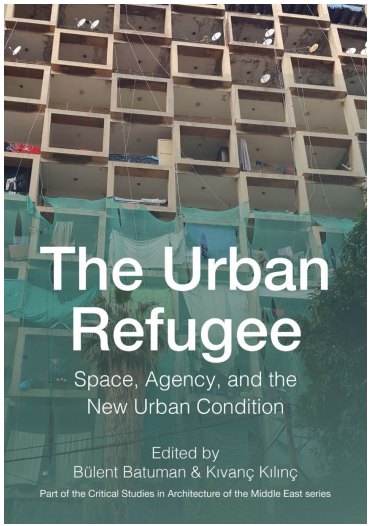
2022



2023



2024



2020s: activating the knowledge acquired over the last thirty years; desire for greater connectivity between knowledge practices and social/ political change. THIS SEEMS LIKE THE RIGHT TIME, THEN, TO INTRODUCE ANIMAL STUDIES INTO OUR PEDAGOGY IN ARCHITECTURAL HISTORY AND DESIGN……..

IV. PEDAGOGY

- 1. Winter 2023: Laying out the material
- 2. Fall 2023: Histories–processes–networks
- 3. Winter 2025: Air–Water–Earth

IV. PEDAGOGY

- 1. Winter 2023: Laying out the material
- 2. Fall 2023: Histories–processes–networks
- 3. Winter 2025: Air–Water–Earth

Establishing shot: "One day, Wenzel made the mistake of mentioning these "errors" within earshot of his professor, the distinguished animal behaviorist Rudolf Jander, who scolded him mercilessly.

'Are you in the mind of the wasp?" Jander had asked. "Do you know what an 'error' is? You can't say, can you? You can only measure. Just measure. The wasps will tell you what this is about; you don't tell them anything.'"

Lee Billings, "The Termite and the Architect," *Nautilus* 2013

1.Winter 2023: Animal Architecture: Nature, Construction, and Culture

Michaela Rife and Claire Zimmerman, University of Michigan: mixed seminar of 18 students

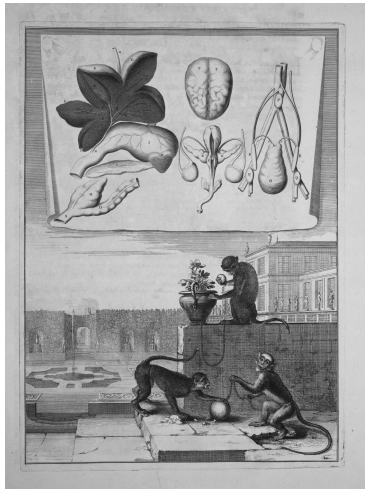
01. Introduction ——— ***Genesis* vs. Book of the Mishomis**
02. Human Constructions for Animals
03. Animals and Humans
04. Animal Architecture

L: The Queen Mary Salter, The Queen Mary Psalter (British Library, Royal 2 B. VII, f.7), c. 1310–1320;
Far left: Norval Morisseau, *Turtle Spirit* (n.d., Robert Mede Gallery)

1.Winter 2023: Animal Architecture: Nature, Construction, and Culture

Michaela Rife and Claire Zimmerman, University of Michigan

01. Introduction
02. Human Constructions for Animals ——— ***Menageries, zoos, slaughterhouses***
03. Animals and Humans
04. Animal Architecture

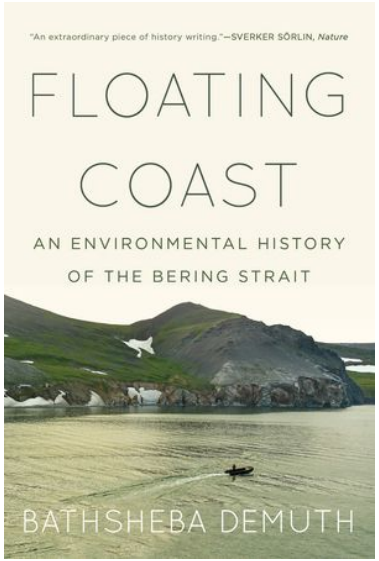


L: Sapajous et Guenon, [Claude Perrault], *Memoires pour servir à l'histoire naturelle des animaux* (Paris, 1676);
Far left: La Villette, Paris: *La grande halles des betes*

1.Winter 2023: Animal Architecture: Nature, Construction, and Culture

Michaela Rife and Claire Zimmerman, University of Michigan

01. Introduction
02. Human Constructions for Animals
03. Animals and Humans ——— **Whale bones, bat shelters, polar bears in huts**
04. Animal Architecture

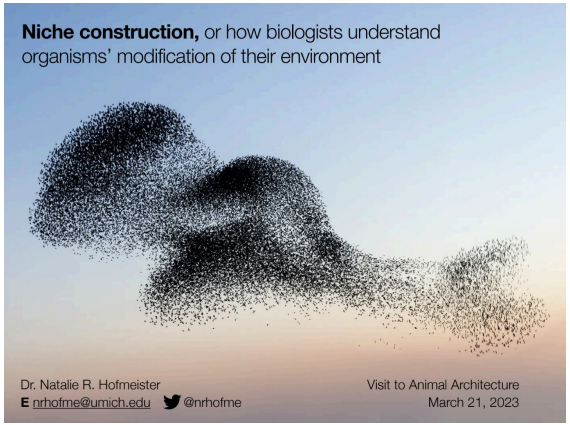


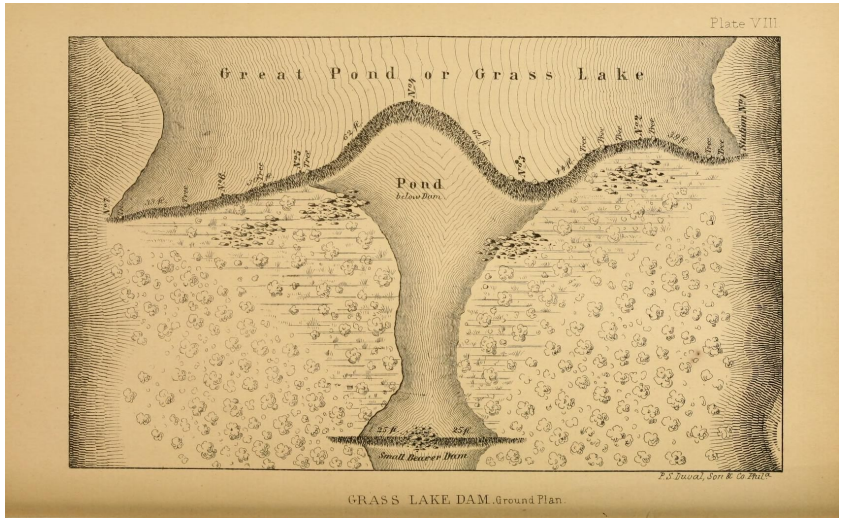
L: Bathsheba Demuth. Also: “Do Whales Judge Us? An Interspecies History” https://www.youtube.com/watch?v=yh_kJA0Naug
Far left: Whalebone architecture, Avan, Russia

1.Winter 2023: Animal Architecture: Nature, Construction, and Culture

Michaela Rife and Claire Zimmerman, University of Michigan

01. **Introduction**
02. **Human Constructions for Animals**
03. **Animals and Humans**
04. **Animal Architecture** ——— **Beavers, bees, nests, mounds, networks**





A: Natalie Hofmeister
L: W.H. Morgan, *The American Beaver*
Far left: Lars Chittka, *The Mind of a Bee*

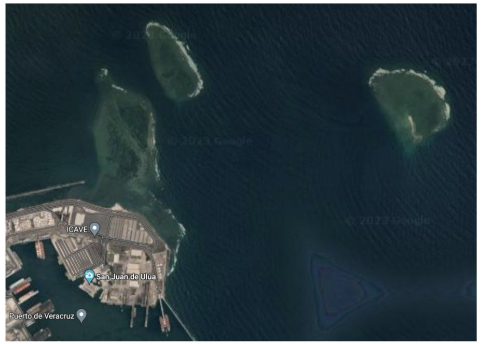
Student projects: Animal Architecture: Nature, Construction, and Culture

Primitive accumulation at San Juan de Ulúa:

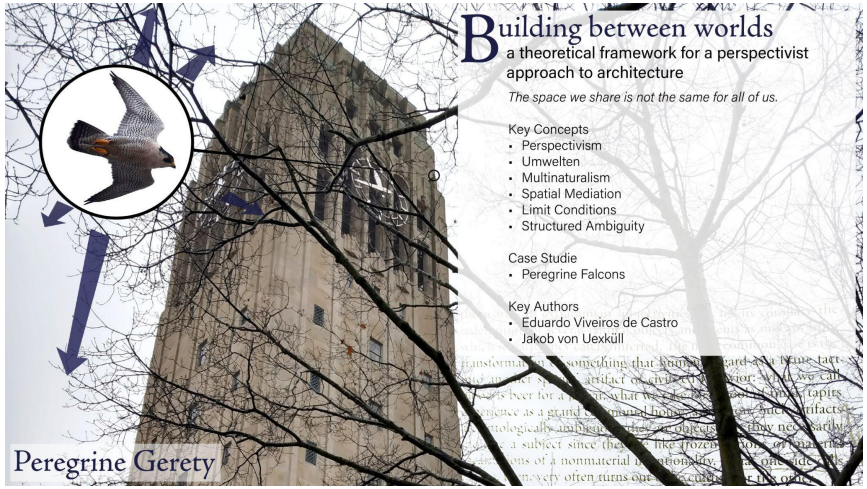
From Allan Sekula's "Piedra Muca" to the expanded geography and timescale of coral

"And so San Juan de Ulúa, the first and last Spanish fortress in Mexico, was built of *piedra muca,* white coral hacked out of the reef. The former living home of fish became a chamber for the inventory of primitive accumulation, temporary warehouse for the flow of Aztec gold to Spain."

– Allan Sekula, *Fish Story*



above: Puerto de Veracruz, San Juan de Ulúa, and the La Gallega Reef, google maps imagery; above and left: coral-as-stone in the walls of San Juan de Ulúa, photographed by Manuel Ángel Bugallo Otero



Touching, Seeping, Rotting, Resting, Weeping

Sarah Tsung

Touch as Embodied Experience, Creating Intimacy, and (Non)Animal Ontologies in Candice Lin's *Seeping, Rotting, Resting, Weeping*

Key points:

Lin's installation as participatory, embodied experience that displaces human viewing

Touch as a central feature of the exhibition

The role of touch as foundation for a relationship of intimacy between humans and nonhumans

New relationality as a rejection of Western humanist ontologies

Drawing on the entangled theories of animacy, animality, racialization and identity politics

Above: Installation view of *Seeping, Rotting, Resting, Weeping* at Walker Art Center

From Enclosures to Encounters: Remapping Taiwan through the 1986 Zoo Relocation

Qingyi Zeng

News photograph of the transfer of animals on Zhongshan South Street, Taipei, 1986

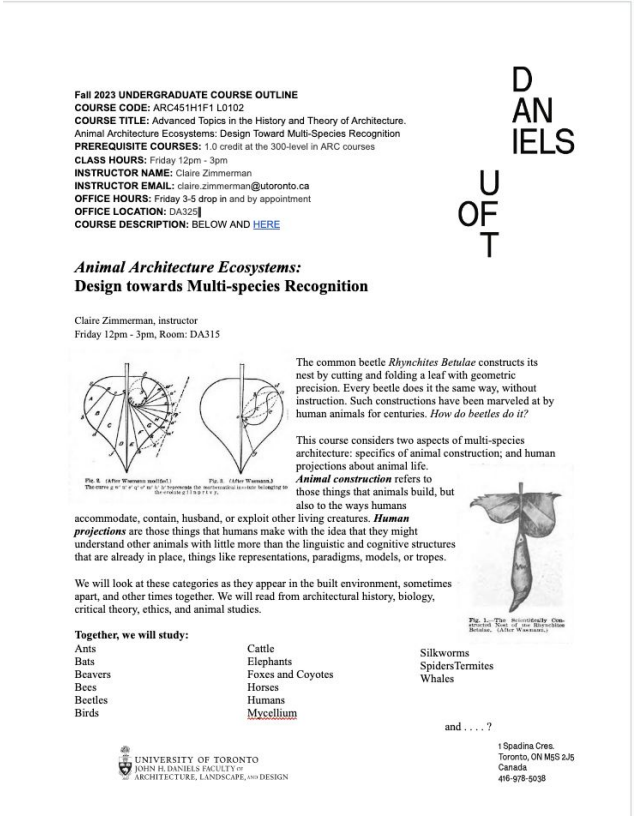
What does it mean for people to witness the modernization of the zoo unfolding before their eyes in the center of the city under an authoritarian/postcolonial regime?

–Overlapping of the colonial and nationalist imaginations
–Encountering of humans/citizens and animals
–A less anthropocentric view on modernization, decolonization, and democratization in Taiwan

2. Fall 2023. *Animal Architecture Ecosystems: Design towards Multi-species Recognition*

Claire Zimmerman, University of Toronto: workshop class, 40 upper-level undergraduate architecture students

01. Introduction
02. Histories
03. Processes
04. Ecosystems



Fall 2023 UNDERGRADUATE COURSE OUTLINE
COURSE CODE: ARC451H1F1 L0102
COURSE TITLE: Advanced Topics in the History and Theory of Architecture.
Animal Architecture Ecosystems: Design Toward Multi-Species Recognition
PREREQUISITE COURSES: 1.0 credit at the 300-level in ARC courses
CLASS HOURS: Friday 12pm - 3pm
INSTRUCTOR NAME: Claire Zimmerman
INSTRUCTOR EMAIL: claire.zimmerman@utoronto.ca
OFFICE HOURS: Friday 3-5 drop in and by appointment
OFFICE LOCATION: DA325
COURSE DESCRIPTION: BELOW AND HERE

D AN IELS U OF T

Animal Architecture Ecosystems:
Design towards Multi-species Recognition

Claire Zimmerman, instructor
Friday 12pm - 3pm, Room: DA315

The common beetle *Rhynchites Betulae* constructs its nest by cutting and folding a leaf with geometric precision. Every beetle does it the same way, without instruction. Such constructions have been marveled at by human animals for centuries. *How do beetles do it?*

This course considers two aspects of multi-species architecture: specifics of animal construction; and human projections about animal life.
Animal construction refers to those things that animals build, but also to the ways humans accommodate, contain, husband, or exploit other living creatures. ***Human projections*** are those things that humans make with the idea that they might understand other animals with little more than the linguistic and cognitive structures that are already in place, things like representations, paradigms, models, or tropes.

We will look at these categories as they appear in the built environment, sometimes apart, and other times together. We will read from architectural history, biology, critical theory, ethics, and animal studies.

Together, we will study:

Ants
Bats
Beavers
Bees
Beetles
Birds
Cattle
Elephants
Foxes and Coyotes
Horses
Humans
Mycellium
Silkworms
SpidersTermites
Whales

and . . . . ?

UNIVERSITY OF TORONTO
JOHN H. DANIELS FACULTY OF ARCHITECTURE, LANDSCAPE, AND DESIGN

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Canada
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2. Fall 2023. *Animal Architecture Ecosystems: Design towards Multi-species Recognition*

Claire Zimmerman, University of Toronto

01. Introduction
02. Histories ——— **Aristotle, *Kitāb al-Hayawān* (Book of Animals), *Huainanzi***
03. Processes
04. Ecosystems

***Huainanzi* (Han China, compiled c. 140 BC):**
"As for the hairy and feathered animals, they belong to the species which fly and run. Therefore, they belong to the *yang*. As for the armoured and scaly animals, they belong to the species which hibernate and hide. Therefore they belong to the *yin*. The sun is the ruler of the *yang*, hence in spring and summer the herd animals shed hair, and at the solstice elaphures and deer shed their antlers. The moon is the ancestor of the *yin*. Therefore, when the moon wanes, the brains of fish deplete, and when the moon dies, the swollen oyster shrinks. Fire goes up and trails, water goes down and flows; therefore birds flying up go high, the fish when stirred go down. Things which are of a kind stir each other."

2. Fall 2023. *Animal Architecture Ecosystems: Design towards Multi-species Recognition*

Claire Zimmerman, University of Toronto

01. Introduction
02. Histories
03. Processes
04. Ecosystems

When whales **die and sink**, their carcasses — known as whale falls **bounty of nutrients** for deepwater creatures.

[Network of termite mounds]

More than 200 million termite mounds have been discovered in Brazil, spread across an area so vast that they are visible from space. (Submitted by Stephen Martin)

Student projects– *Animal Architecture Ecosystems: Design towards Multi-species Recognition*

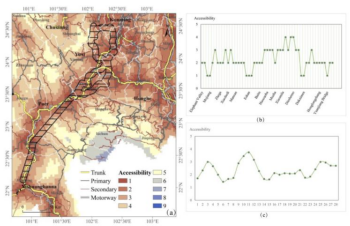


Figure 2: Traffic accessibility analysis of the movement route of Asian elephants.
(a)the spatial pattern of traffic accessibility,
(b)the traffic accessibility change curve of recorded locations,
and (c) the traffic accessibility change curve of the buffer grid from south to north[16].

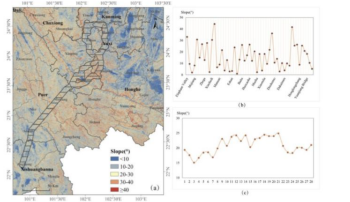
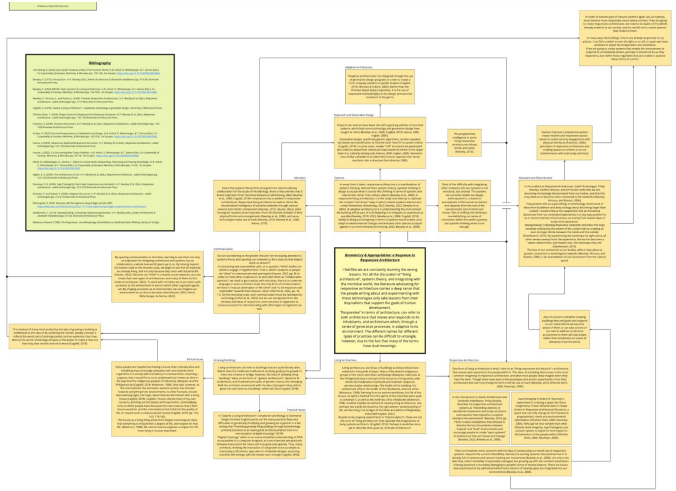


Figure 3:Slope of the 2021 Asian elephant movement route.
(a)the spatial pattern of slope,
(b)the slope change curve of recorded locations,
And (c)the slope change curve of the buffer grid from south to north[17].

Figure 2. Slope of the 2021 Asian elephant movement route. The figure was composed of three parts: **(a)** the spatial pattern of slope, **(b)** the slope change curve of recorded locations, and **(c)** the slope change curve of the buffer grid from south to north.

L: “Elephant Exodus,” March 2020, Yunnan Province (Rayna Wei)
R: Mapping Biomimicry (Akenaz Dolson)
BL: Spiders and Webs (Kristen Wells)
BR: Project Llama (Antonio Vergara)



3. Winter 2025. *Animal Space and Multi-species Recognition*

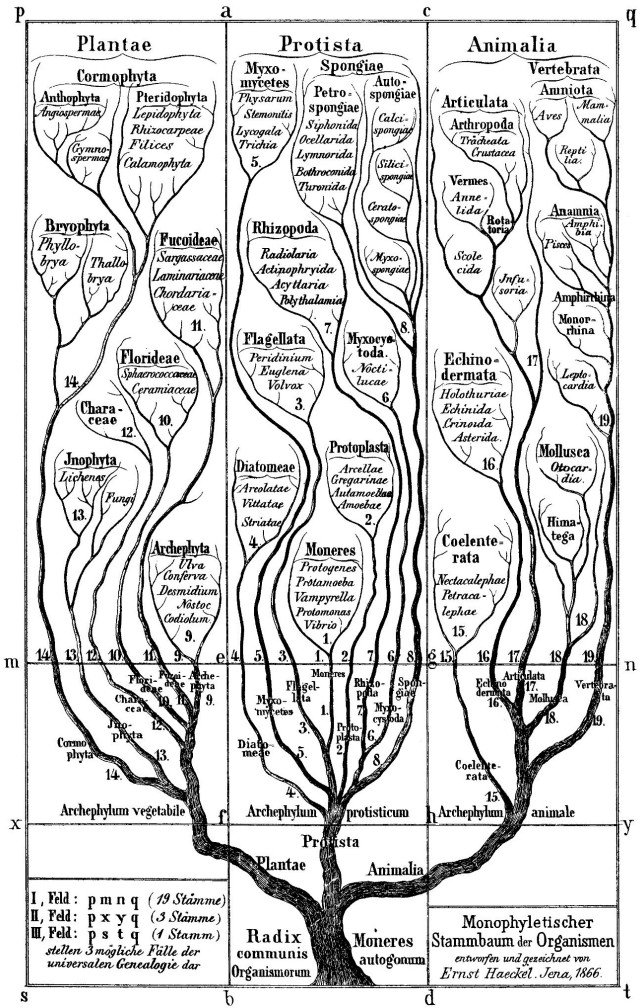
Claire Zimmerman, University of Toronto

01. Introduction
02. Air: birds, bats, bees, insects
03. Water: beavers, whales, shells, octopi
04. Earth: Ants, termites, mycellium

Kim Tallbear: ". . . Indigenous peoples have never forgotten that nonhumans are agential beings engaged in social relations that profoundly shape human lives. . . . These and other newer approaches clearly link violence against animals to violence against particular humans who have historically been linked to a less- than- human or animal status." [Kim TallBear (Sisseton-Wahpeton Oyate), "An Indigenous Reflection on Working Beyond the Human/Not Human," *GLQ: A Journal of Lesbian and Gay Studies* 21 (2015): 234.

Things to return to:

- Huainanzi and Animals in ancient China
- Aristotle
- Michel de Montaigne
- *Umwelt* (J. von Uexküll) and perspectivism (E. Viveiros de Castro)
- Cattle vision: Temple Grandin (and Cary Wolfe on Grandin)
- Cognition and animal mapping (Gould and Gould)
- Ecological perception (James Gibson)
- *The Mind of a Bee* (Lars Chittka)
- *The Animal that Therefore I am* (Jacques Derrida)
- Mycellium: Mervin Sheldrake and Anna Tsing
- Octopus minds: Peter Godfrey-Smith
- Indigenous knowledge practices



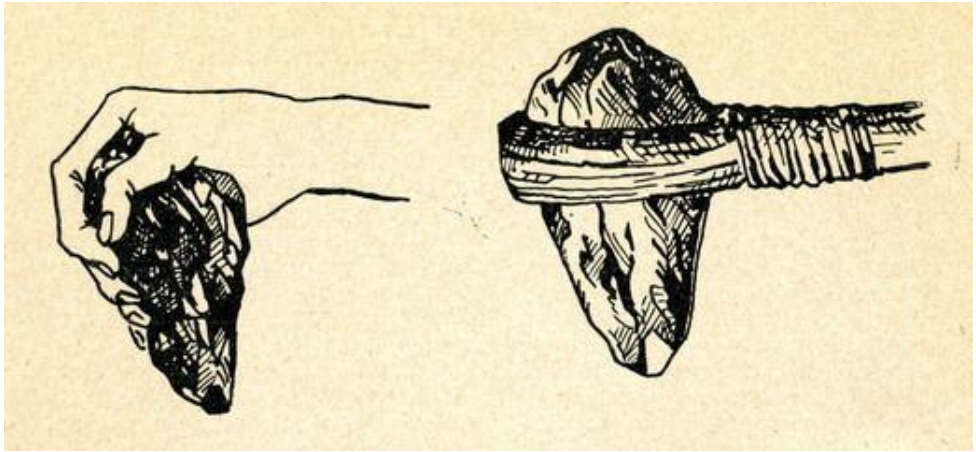
"The history of animals has the shape of a tree…..Now imagine sitting on a branch at the top of the tree, looking down. You are on the top because you are alive now (not because you are superior), and around you are all the other organisms alive now. Close to you are your living cousins, such as chimpanzees or cats . . . . If you now look down the tree, toward the roots, you'll see your ancestors, both recent ones and those more remote. . . . Now let's look for the common ancestor that connects this first group of animals, which includes ourselves, to an octopus. To find this animal we have to travel much further down the branches. When we find it, about 600 million years before the present, the animal is [a] flattened wormlike creature……"

Peter Godfrey Smith, *Other Minds: the Octopus, the Sea, and the Deep Origins of Consciousness* (2016), 6-8.

L: Ernst Haeckel, "Monophyletischer Stammbaum der Organismen" from *Generelle Morphologie der Organismen* (1866) with the three branches Plantae, Protista, Animalia

Thank you!

Ernst Kapp, *Elements of a Philosophy of Technology: On the Evolutionary History of Culture*
Written 1877; translated into English and republished 2018



"Hence, artworks and machine works both preserve the memory of their provenance—both in the organs of the human body and in the first equipment formed in the image of the organ. In this way, the human being maintains an inner relation with the artifacts belonging to the outside world that are produced in accord with the normative organs inside of him." KAPP, 48

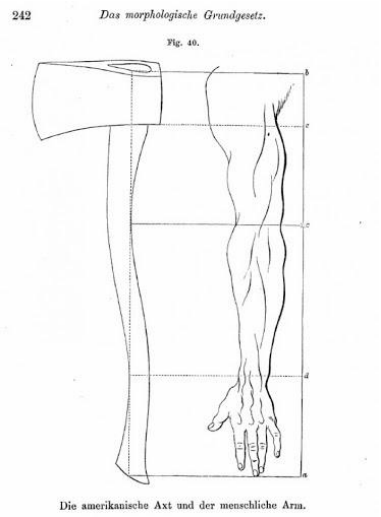

242 *Das morphologische Grundgesetz.*

Fig. 40.

Die amerikanische Axt und der menschliche Arm.

DESIGN and TECHNOLOGY

“the architect raises his structure in imagination before he erects it in reality.”

Thus Marx describes acts of imaginative projection, as interior *representations* of a finished product, and as an *essential human capacity*, differing from that of animal constructors (bees, spiders, birds, beetles, beavers, etc.)

But we ask, rather, what is common to both kinds of animals, human and non-human?

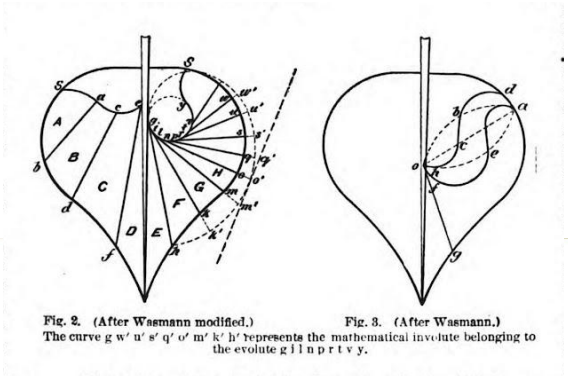


Fig. 2. (After Wasmann modified.) Fig. 3. (After Wasmann.)
The curve g w′ u′ s′ q′ o′ m′ k′ h′ represents the mathematical involute belonging to the evolute g f l n p r t v y.

BUREAU OF AMERICAN ETHNOLOGY FORTY-FIRST ANNUAL REPORT FRONTISPIECE

Lillooet. Showing a head design

Thompson. A. M. N. H. 16-4611. Designs: "Butterfly cut off," "Butterfly wings" (Spuzzum, 1 1/2 mi),
"Butterfly" (Lytton), "Arrowhead" (Lytton etc., Thompson)

“. . . the basket-maker begins to work with a pretty clear idea of what a well-woven basket should look like. . .But. . .it is evident that the form of the basket emerges not from these standards but from a complex pattern of finely controlled movements.”

Timothy Ingold on Franz Boas *Coiled Basketry in British Columbia and Surrounding* 1928–START AT P. 486/HATHI #500

Thus anthropologists describe the process of making as **the interaction between an idea and the means of its execution--both the process of making (“a complex pattern of finely controlled movements”) and the material of which something is made.** In this case, the process of making something, whether human or animal, reflects the combined agency of the brain, and the available materials. Together these constitute a **technology.**

CLOSING THOUGHTS: Teaching has focused on perception and physical ways of knowing.

Kim Tallbear: ". . . Indigenous peoples have never forgotten that nonhumans are agential beings engaged in social relations that profoundly shape human lives. . . . These and other newer approaches clearly link violence against animals to violence against particular humans who have historically been linked to a less- than- human or animal status." [Kim TallBear (Sisseton-Wahpeton Oyate), "An Indigenous Reflection on Working Beyond the Human/Not Human," *GLQ: A Journal of Lesbian and Gay Studies* 21 (2015): 234.

"There is no reason to doubt that the basket-maker begins to work with a pretty clear idea of what a well-woven basket should look like. She has her standards. But watching her at work, it is evident that the form of the basket emerges not from these standards but from a complex pattern of finely controlled movements."

Timothy Ingold on Franz Boas *Coiled Basketry in British Columbia and Surrounding* 1928

BUREAU OF AMERICAN ETHNOLOGY FORTY-FIRST ANNUAL REPORT PLATE 2

WOMAN MAKING A BASKET. (P. 167)

BUREAU OF AMERICAN ETHNOLOGY FORTY-FIRST ANNUAL REPORT FRONTISPIECE

Lillooet. Showing a head design

Thompson. A. M. N. H. 16-1611. Design: "Butterfly cut off," "Butterfly wings" (Spuzzum, Utā'mqt), "Butterfly" (Lytton), "Arrowhead" (Coldwater, Thompson)

Teaching Animal Architecture

- Intro:
  - My obsessions: Marx and Rhyncitus Betulae
  - Disclaimer; contact with Richard
  - context of architectural history
- Teaching Animal Architecture
  - Teaching not as a function of research focus but also of social necessity or urgency
  - Teaching as activism
- 3 versions of class:
  - 1. Laying out the material
  - 2. Histories–processes–networks
  - 3. Air–Water–Ground
  - Commonalities: ending with mycellium; focusing on knowledge itself
    - Marx; western knowledge paradigms Wasp and termite article; posthumanism
    - J. Von Uexkull/ E. Viviera de Castro
    - Aristotle
    - Asian animal studies
    - Indigenous knowledge
- Increasing focus on questions of animal perception and knowledge
  - Begins with Marx on architects and bees;
  - Increasing dependence on indigenous knowledge;
  - problematic of equivalency between indigenous people and animals–is this a problem?