A FICTION IN WOOD AND CONCRETE
Exploration of Material as a Protagonist in Architecture

Master Thesis project

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The School of Architecture building, designed by Tham and Videgård Arkitekter, was finished in 2015. Round concrete cores were cast and pinewood cladding was nailed board by board on partition walls. The building was still empty and materials reigned inside. Sand grains in concrete were anxiously bubbling, mixing with cement powder and water, while wood fibers were shaking nervously, trying to grow higher and poke through the ceiling.

There was a granular logic underlying in concrete. The granules whirled and turned into round structures, attaching one to another, growing so big, that they rotated through the walls, filling the rooms.

There was a fibrous logic concealed in pinewood. The fibers grew into elongated structures, protruding the floors and extending through the walls from room to room. Formations of fibers turned into volumes, starting on one level, and continuing to the other. Fibers determined the outline of the volumes and the openings in them, as well as their surface. The fibrous logic began to transfer to concrete as well, defining the outline of solid concrete volumes, as well as voids in them and their surfaces. Structures and volumes interlaced, as both were growing quickly, filling the building with new forms.

(the narrative)
SECTION DRAWING 1:5
A FICTION IN WOOD AND CONCRETE
a section through the narrative
and through the School of Architecture building
-- thesis question --

In architectural discourse, form is usually designed first, then a material is chosen to build the volume with.

In Aristotle’s concept of hylomorphism, hyle (matter) is given shape by morphê (form).

How can this relationship be looked at differently - can materials’ surfaces at microscale become generators of form and structure?
--the context--

The context – the School of Architecture building – is the driving force for the narrative: the two dominant interior materials - wood and concrete – generate the new volumes and structures, that are brought back to the context after a series of translations – the new forms interact with and transform the existing built structure.

In room A524, a full scale installation is built in wood and concrete, as a part of the narrative, depicted in the section drawing through the School of Architecture building.
INSTALLATION IN THE ROOM
A FICTION IN WOOD AND CONCRETE

INSTALLATION VIEW THROUGH THE WINDOW
A FICTION IN WOOD AND CONCRETE
-- the full scale installation --

This installation, built in wood and concrete, explores the possibilities of matter to inform architecture: surface of materials is captured and translated into form and structure, following the underlying material logic.

The built installation itself becomes an interface between fiction and reality: the narrative, revealed in the section drawing, empowers the design of the physical installation – and the narrative becomes tangible through the built structure.

-- the fiction --

Jeffrey Kipnis writes that “[architecture] operates as a representational practice on a spectrum from realism to abstraction”, later in the text opening a discussion whether there can exist fiction in architecture¹. This architectural fiction abstracts the qualities of materials, but the built installation brings the fiction back to the physical reality.
SURFACE DETAILS OF THE VOLUMES
CNC-MILLED
--the method--

Two material samples (size 4x4 cm) with a significant surface are prepared for capturing the qualities of materials: wood and concrete.

Both analogue and digital techniques are employed for translations: surface of broken material samples are 2D scanned and traced by hand, offsetted and laser-cut, put together as models, turning them into tridimensional structures, following the underlying logic of the material. The same samples are also 3D scanned, transformed digitally, cutting them in layers, generating outlines, openings and voids, and CNC-milled, thus resulting in new volumes.

The input for scanning is physical (the material samples of wood and concrete), but the information that is captured (the point cloud matrix and the traced lines) is digital and the transformations that are carried out (cut, offset, extrude, mirror) are also classical digital operations. The transformed geometries are turned physical again by fabricating them as solid volumes in wood and concrete, while the structures are fabricated to be physical, but not possessing any material qualities – black tridimensional lines.

The new structures and volumes inherit the different characters of the two materials: elongated, fibrous geometries stem from wood and round, whirling, granular geometries stem from concrete.
when transforming the scanned samples, a certain logic of materials is kept in mind:

fibrous logic of wood
and
granular logic of concrete.

the electron micrograph scans illustrate and confirm this material logic.
2D scanning + tracing >>> STRUCTURES

--method--
3D scanning >>> VOLUMES

---method---
-- method --

STRUCTURES

2D scan
trace
offset
laser cut

build a physical model

-- method --

VOLUMES

3D scan
cut
offset
extrude
mirror

CNC-mill
These new forms represent the qualities of wood and concrete, but they are alienated by transformation. They have characteristics of both material and artificial, both figurative and abstract, similar to Chinese scholar rocks, that Herzog and de Meuron are inspired by: "yet it remains unknown to what extent the 'natural' shapes of these stones have been manipulated, an artifi-ciality enhanced by the wood or stone pedestals created for them."2

Jeffrey Kipnis writes about the Miller House: "[The house is] transforming its owners and visitors alike into characters and transporting them away from a strongly grounded sense of being in the here and now into a world of pre-tense and imagination."3

A fictive atmosphere, the "sense of transporting us elsewhere" is created in the room, as the scale of a material surface is now a scale of a volume or a structure, cutting through the building. The new form is juxtaposed with a traditional architectural structure, the new volumes and structures cutting through the slabs and walls, thus creating new spaces inside and around themselves.

What is closer to reality in the section drawing of this architectural fiction – the concrete slabs that are now cut through and fragmented, or the volumes and structures, overtaking the building?
Herzog and De Meuron
SCHAULAGER

“the gravel material excavated on site was used to construct the walls, but it also determined the forms and surface structures of other parts of the building, inside and outside.”

Adam Fure/SIFT studio
ROCKS

“texture can transform from surface to massing”
--references--

1 Jeffrey Kipnis “Mulling the Miller”. “Et in suburbia ego: José Oubrerie’s Miller House.” Columbus, Ohio: Wexner Center for the Arts, The Ohio State University, [2013].

2 Herzog & de Meuron “Natural History” edited by Philip Ursprung. Canadian Centre for Architecture, [2002].

3 Jeffrey Kipnis “Mulling the Miller”. “Et in suburbia ego: José Oubrerie’s Miller House.” Columbus, Ohio: Wexner Center for the Arts, The Ohio State University, [2013].

4 (ibid.)