F. Berni's redrawn illustrations from *Entangled Life*, M. Sheldrake

Exploring Mycelium in Urban Water Management Through Autopoietic Processes and Holistic Perspectives. Insights from the Polish City of Łódź

Francesca Berni (Politecnico di Milano)

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*Nature in the City*_Sciences Po Paris Campus 11-12 December 2024

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Introduction

“[...] staying alive—for every species— requires livable collaborations. Collaboration means working across difference, which leads to contamination. Without collaborations, we all die.”

From *The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins*, A. L. Tsing

LIVING IN MYCELIUM, Pavillion of Belgium, 18th International Architectural Biennale of Venice (2023). 📸 F. Berni

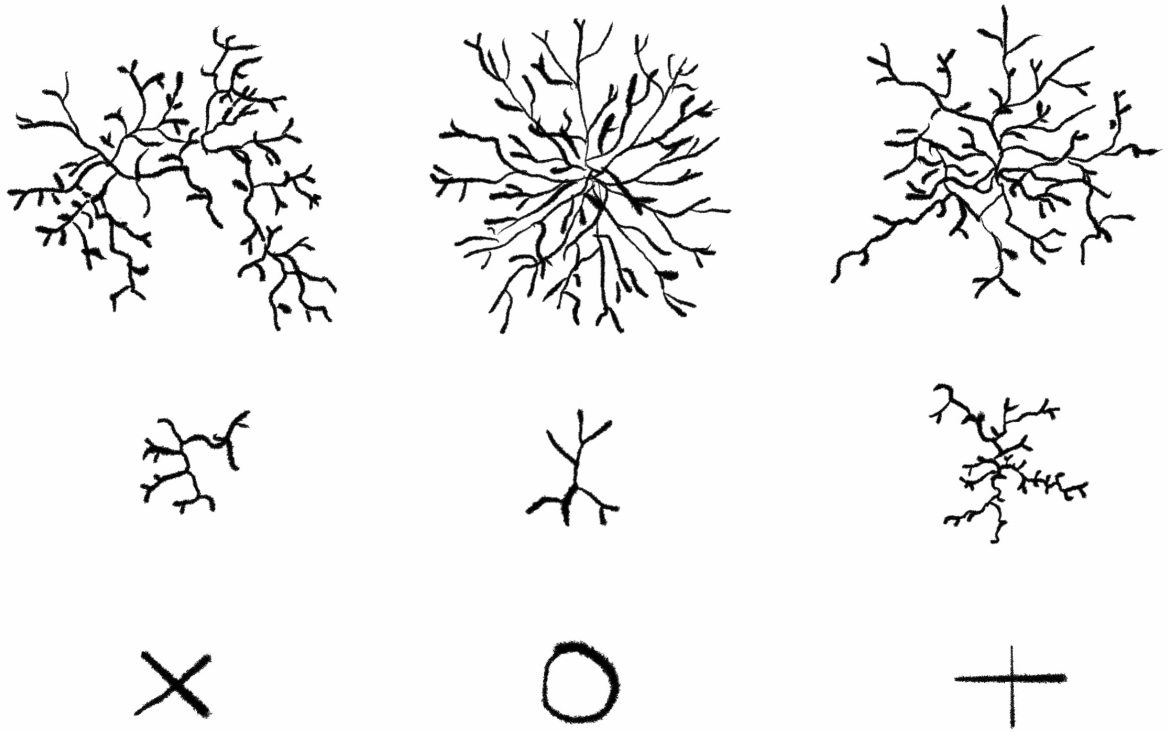
An inspirational experience: Co-creation in Łódź

Łódź, May 2024 PALIMPSEST Residential Workshop. 📸 F. Berni

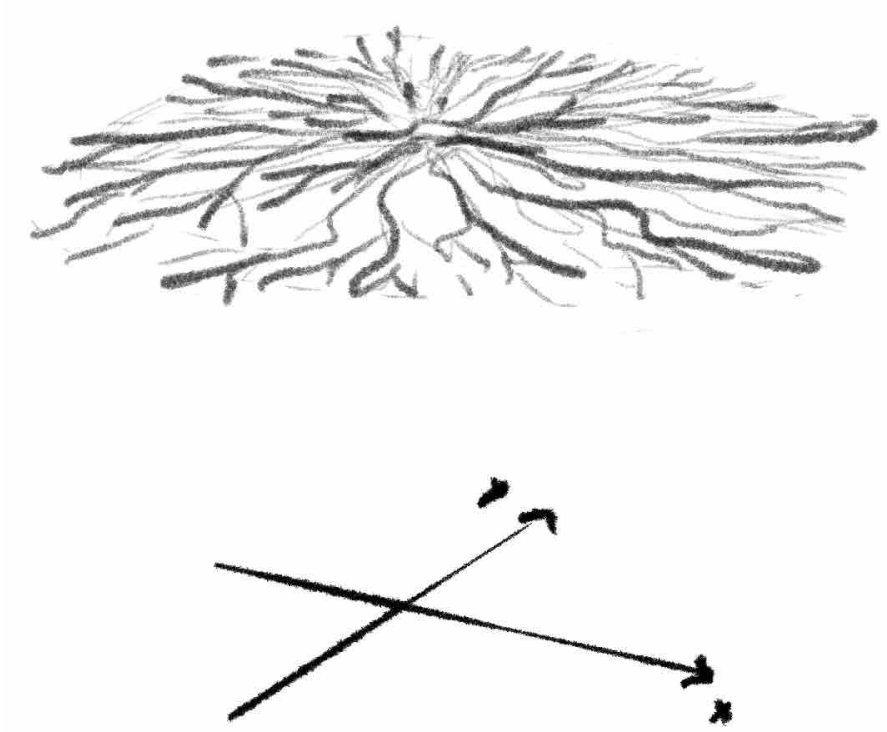





Defining Mycelium



Boletus *Tricholoma* *Amanita*



"Mycelium is a body without a body plan." (Sheldrake 2020). Above, mycelium exploring a flat surface

F. Berni's redrawn illustrations from *Entangled Life*, M. Sheldrake

Mycelium as a metaphor

Μεταφορά: ‘transfer’ > from *μεταφέρω* > *μετα*: ‘beyond,’ *φέρω*: ‘to carry’
“to carry beyond.”

Mycelium as a metaphor for:

- decentralized and interconnected systems (Fricker et al. 2017)

- cooperation and mutualism (Staddon 2009; Steindhart 2012)

- reimagining human-nature interactions (Metta 2022)

- regeneration (Salifu 2019)

Mycelium as a technical device

Hyphae leave behind microscopic tunnels in the soil through which water and air flow, contributing to soil structure and health (Lowenfels 2017).

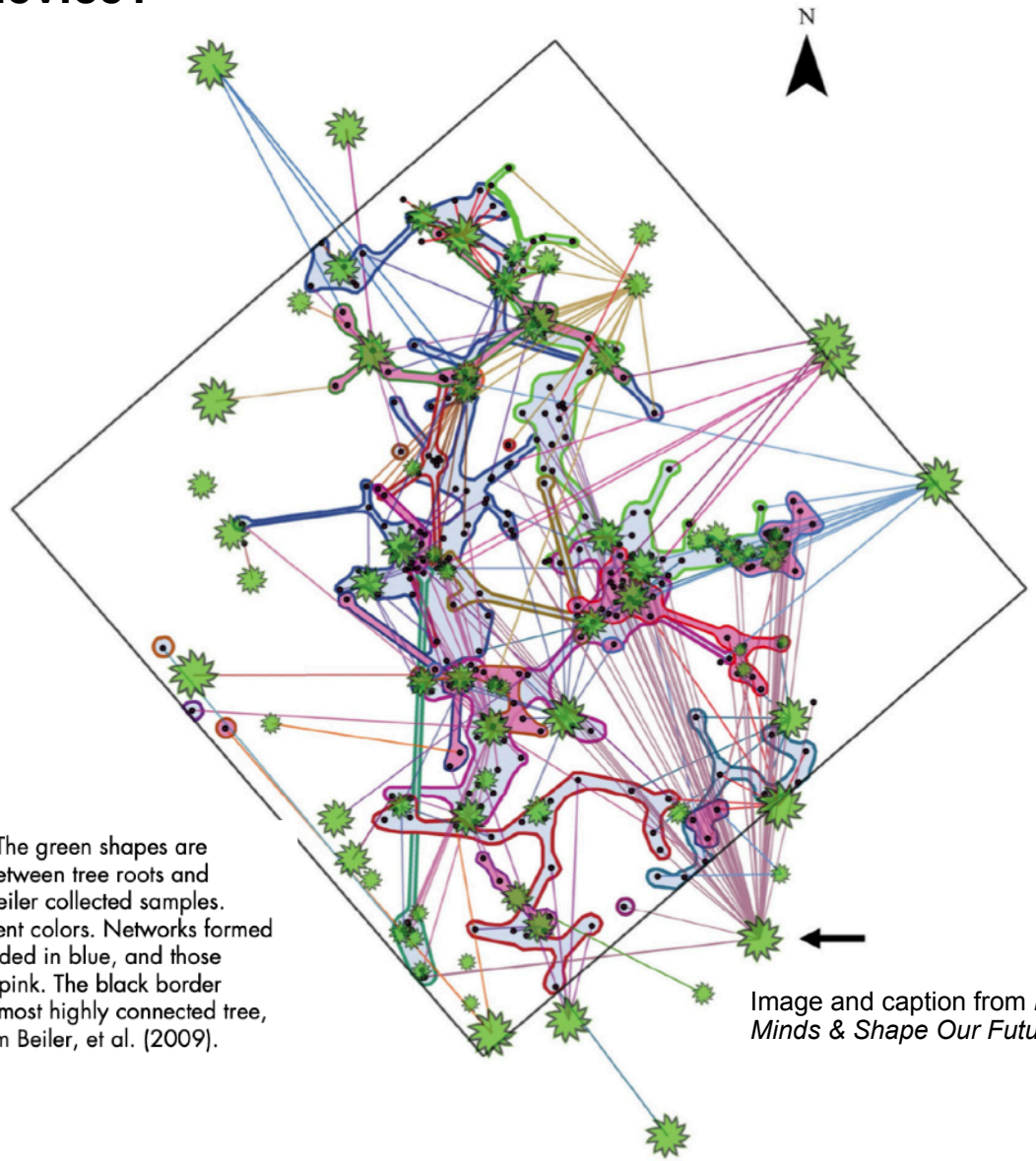
Mycelium is at the base of recent radical fungal technologies such as:

Mycoremediation: μύκης *(mukēs), meaning "fungus," and the suffix* -remedium, *"restoring balance," is a fungi-based remediation technology used to decontaminate the environment.*

While fungi-based technologies have been researched extensively in terrestrial settings, they have received less attention in the aquatic environment (Zeghal et al., 2021).

In mycoremediation, microfiltration technologies treat contaminated water by passing it through mycelium mats, which filter out and break down biological and chemical toxins.

Mycelium: metaphor or device?



A map of a shared fungal network made by Kevin Beiler. The green shapes are Douglas fir trees, and the straight lines indicate linkages between tree roots and mycorrhizal fungi. The black dots mark the points where Beiler collected samples. Genetically identical fungal networks are outlined in different colors. Networks formed by the mycorrhizal fungus *Rhizopogon vesiculosus* are shaded in blue, and those formed by the fungus *Rhizopogon vinicolor* are shaded in pink. The black border marks the 30 × 30 meter plot, and an arrow points to the most highly connected tree, which was linked to 47 other trees. Image reproduced from Beiler, et al. (2009).

Image and caption from *Entangled Life. How Fungi Make Our Worlds, Change Our Minds & Shape Our Future*, Merlin Sheldrake

Remarks and open questions

- *“The metaphor of mycelium encourages iterative, organic approaches to design that allow solutions to evolve over time, rather than being pre-determined” (Huang et al., 2020).*

- *Mycelium as an in-between entity: engaging with water-mycelium-driven landscapes becomes an experimental act at the edge of where conventional formulas falter.*

Łódź, Jasieniem Park, May 2024 PALIMPSEST Residential Workshop. 📸 F. Berni

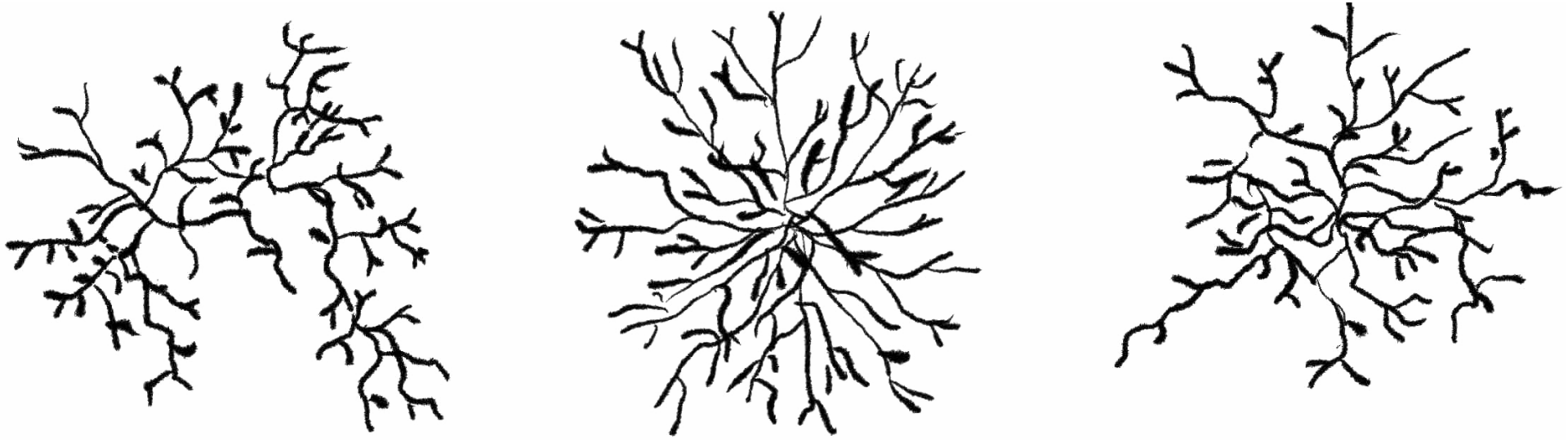
Łódź and beyond: next steps

- *Practice-based research and in-situ experiments to explore key questions, including:*

(i) What technical and ecological uncertainties arise when integrating mycelium into urban water systems, and how can these challenges be addressed within specific material and spatial conditions? (ii) Under what conditions can mycelium facilitate interspecies cooperation in particular settings?

- *Considering mycelium as a boundary object, bridging technical innovation and conceptual inquiry in contemporary design practices.*

- *Fostering systemic design perspectives emphasizes ecosystemic thinking and promotes the recognition of non-human entities within design processes.*



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Thanks!

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