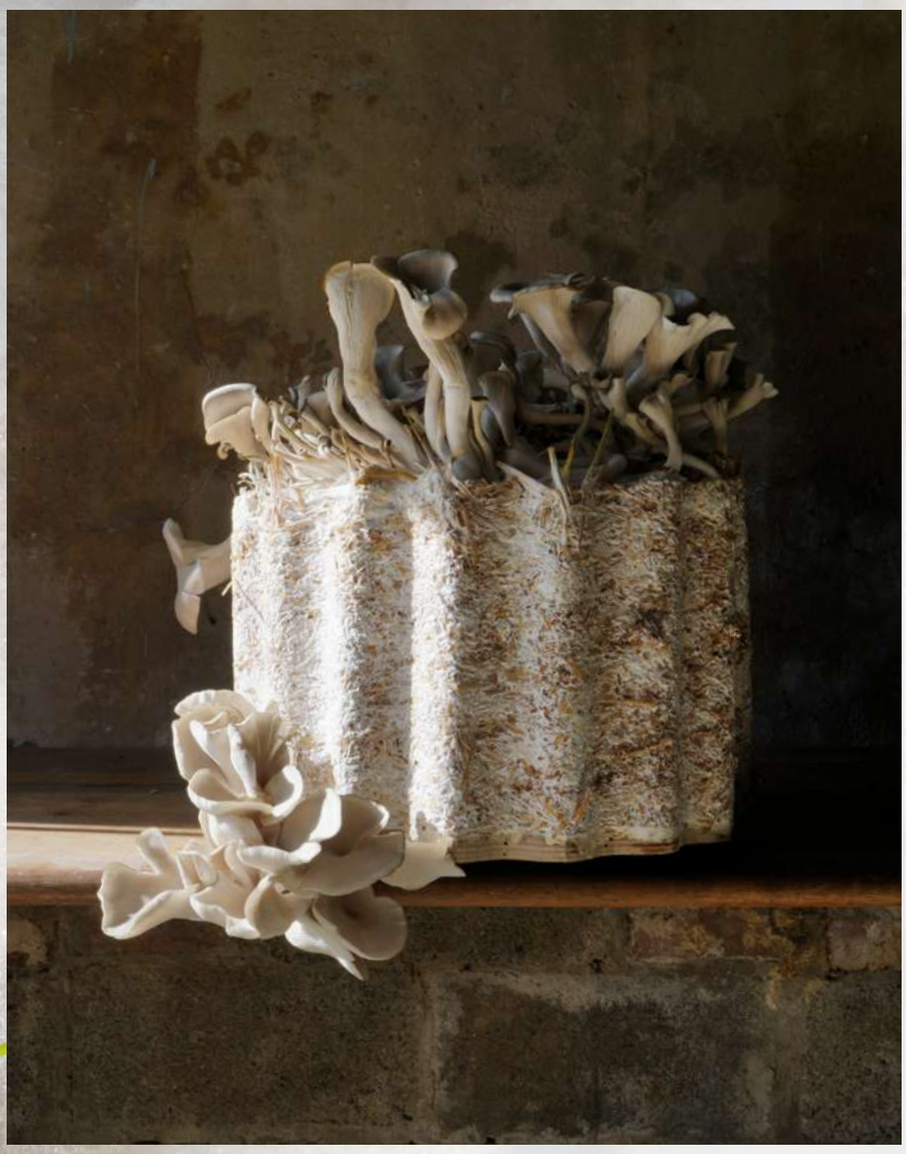
*'The ruin glares at us with the horror of its abandonment.'*
Anna Tsing, *The Mushroom at the End of the World: On the Possiβility of Life in Capitalist Ruins*



RUINED *prototype after fruiting of the mycelium and before drying, carried out in Brussels in February 2023.*

# RUINED

## *A Mycological Building and Degrading Process*

***RUINED*** starts in May 2023 with a two-day transdisciplinary workshop combining architecture, mycology and art. The aim is to build pieces made of mycelium, a non-polluting material with immense potential, particularly in construction, together with a group of architecture students. These will then be exhibited in the hall of the EPFL campus (Lausanne), where the growth of the mycelium can be observed. In August 2023, the pieces will be assembled as columns, inspired by Roman ruins in the region, for the ***ROT GARDEN*** installation at the far° festival des arts vivants in Nyon. Later on, we are planning to travel with them to n0dine (Brussels) and build the capitals for these columns with a group of people in Brussels. We imagine a long-term process of adding new elements at every iteration in different contexts.

As a matter of fact, ***RUINED*** began in 2021 when the team met during ***Technologie des champignons***, an open school organized in the forest of Burtigny in collaboration with far°. Sébastien Tripod (architect) and Jennifer Russo (educator) worked on ***La Brique du futur*** (Lausanne), Deborah Robbiano (multidisciplinary artist, student in mycology at the Mycologos school founded by Peter McCoy, author of ***Radical Mycology - A Treatise On Seeing and Working With Fungi***) and Sara Manente (choreographer, researcher) all engaged with mycelium in different contexts: architecture, pedagogy, art and design. They decided to join forces—out of curiosity and a series of contingencies—and experiment on a bigger architectural scale.

**Sébastien Tripod, Deborah Robbiano & Sara Manente**

# COLUMNS

This research aims to create a fungal archetype of a well-known architectural element: the column. This element represents one of the first support structures in construction to have been adapted over the centuries. It has been shaped by the evolution of the different architectural orders coming from the ancient Greek and Roman civilizations. Each of these orders is distinguished by particular proportions, details, techniques and materials that relate to the transformation of the society in specific territories. Hence, those shifts in history evoke the need for constant renewal of our constructive concepts. In permanent adaptation, mushrooms constitute the past, present and future of our relation with the landscape and may represent a new building material for the future.

The experimental construction is underpinned by speculation: What does it mean to erect a ruined monument? We evoke the figure of the ruin to conceive something that is not crystallized in a fixed form. The ruin talks about the relation between time and matter, therefore about the question of finitude in our built environment. It is about engaging with process rather than concept. What does the life of mycelium evolving from solidification, fruiting, drying and decomposition imply about the act of building and the art of living? Is it a material built up over time which needs a careful gesture of moulding and de-moulding? What might be the effect of a new craftsmanship on our 'constructed environment'?

More generally, the issue of columns as supporting elements of monumental architectures raises questions about the notions of achievement and growth. What is monumentality today, when we need to rethink growth? Can we possibly imagine the mushroom breaking the mould, the column emerging and celebrating itself as a moment of finitude that will slowly decay over time?

## RUINATION

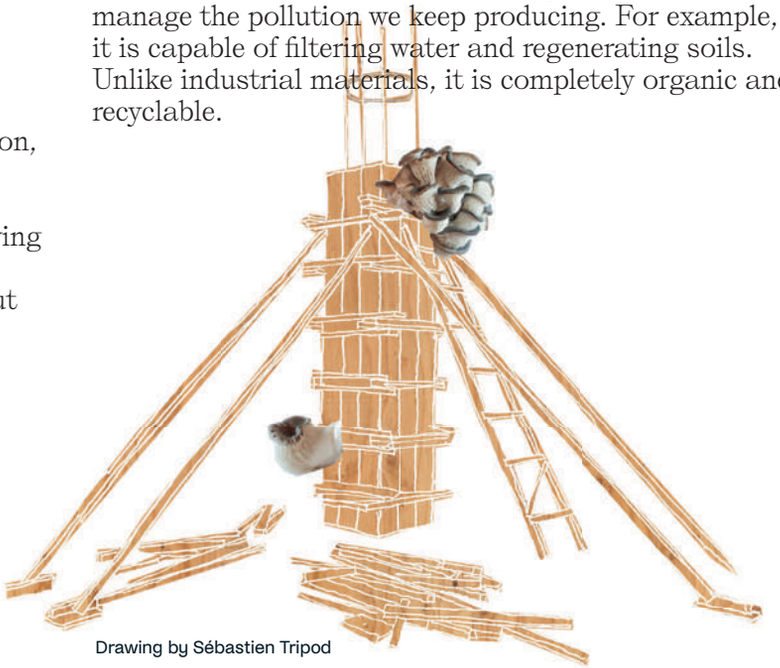
Ruins evoke a durational process: they are in transition, on the verge of falling. But most of the time, even in tales of ruination, as Anna Tsing explains, progress still controls us. 'We are stuck with the problem of living despite economic and ecological ruination. Neither tales of progress nor of ruin tell us how to think about collaborative survival. It is time to pay attention to mushroom picking. Not that this will save us – but it might open our imaginations.'

## WHY BUILD WITH MYCELIUM?

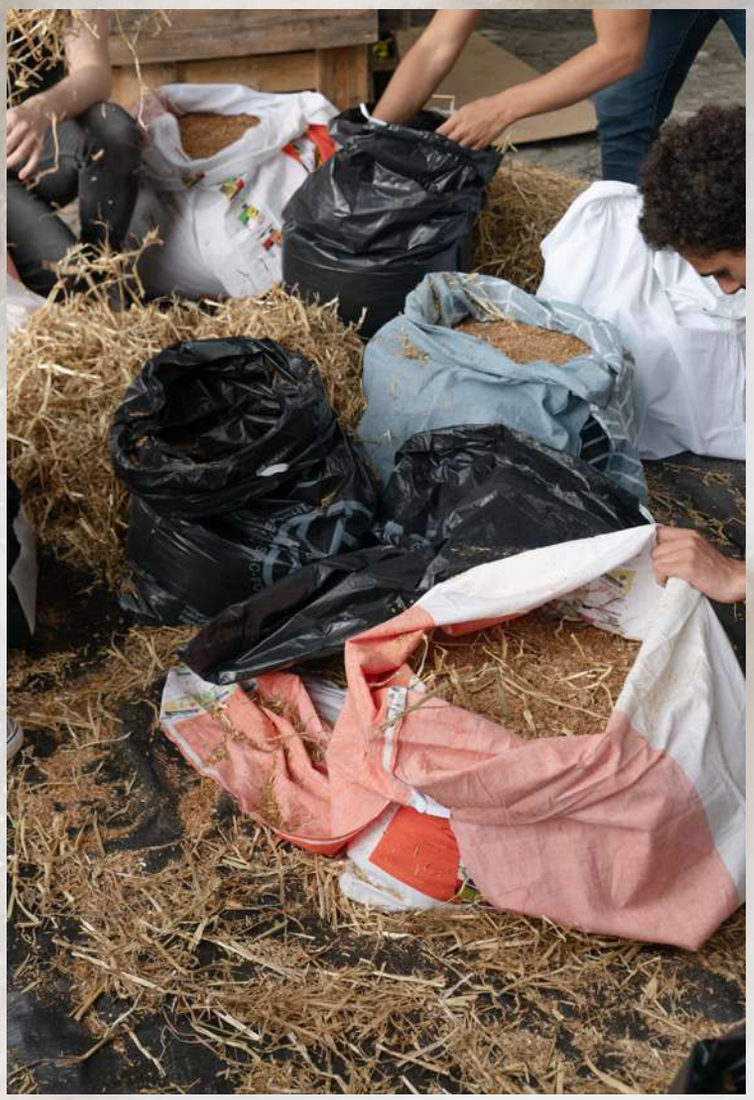
The construction industry uses a large part of our resources. According to COP26, it is responsible for 11 per cent (on average) of greenhouse gas emissions worldwide.

Concrete, made from cement, is an important resource in the construction industry. It is one of the most energy-intensive materials in the world. It is essential to reflect together on the transformation of this industry and on the new materials which, in the future, will be able to renovate, build and care for the environment.

Mycelium is one of the most promising natural materials for the future because it can feed on the waste products of various industries: our ruins. It represents a way to manage the pollution we keep producing. For example, it is capable of filtering water and regenerating soils. Unlike industrial materials, it is completely organic and recyclable.



Drawing by Sébastien Tripod



# RECIPE FOR 1 RUINED MODULE: *DIAMETER 130 CM, HEIGHT 30 CM*

*This recipe can be adapted to any mould. Just keep in mind that your mould should have some holes to let the mycelium breathe.*

## INGREDIENTS

### FOR THE SUBSTRATE

*6kg of hardwood sawdust*
*2kg of straw (or 75% of straw and 25% of sawdust)*

### FOR THE COLD PASTEURIZATION

*2×2 m cotton sheet*
*(it can be a washed used bedsheet)*
*16 l of water (roughly twice the amount of the substrate volume)*
*34 g of slaked lime-Calcium Hydroxide-$Ca(OH)_2$*
*(or 2g per l of water)*
*1 pH test strip*
*1 metal grid for the draining process*

### FOR THE INOCULATION

*800 g of oyster mushrooms grain spawn or 10% of the total substrate volume*
*1 spray bottle containing a solution of 70% isopropyl alcohol and water for sterilization*

## STEP 1

Lay the cotton sheet flat on the floor. Lay some straw (1cm thick) on the sheet the size of your mould. Cover the straw with a layer of sawdust. Repeat this step, *making a kind of lasagna*, until you have used all the straw and sawdust. Make a bundle with the sheet.

## STEP 2

Take the 34 g of lime and dissolve in a small container filled with cold water. Transfer the solution into the 16 l cold water bath and mix well. Take a pH strip and dip it in the bath. Take it out and wait 10 min for it to dry out a bit to get a more accurate colour. Anything between the values of 9.5 and 12.5 will work.

*Lime pasteurization slows the growth of some bacteria but it does not kill them. This type of pasteurization is used with substrates that are very light in nitrogen (so it doesn't work with coffee grounds substrates, for example) and also with mushrooms that have good growth. After three to five days, the pH will become neutral again and bacterial activity will restart, so the substrate must be used quickly after being pasteurized. Once the substrate is inoculated, the mycelium will rebalance the environment through the release of acidic pH enzymes.*

# STEP 3

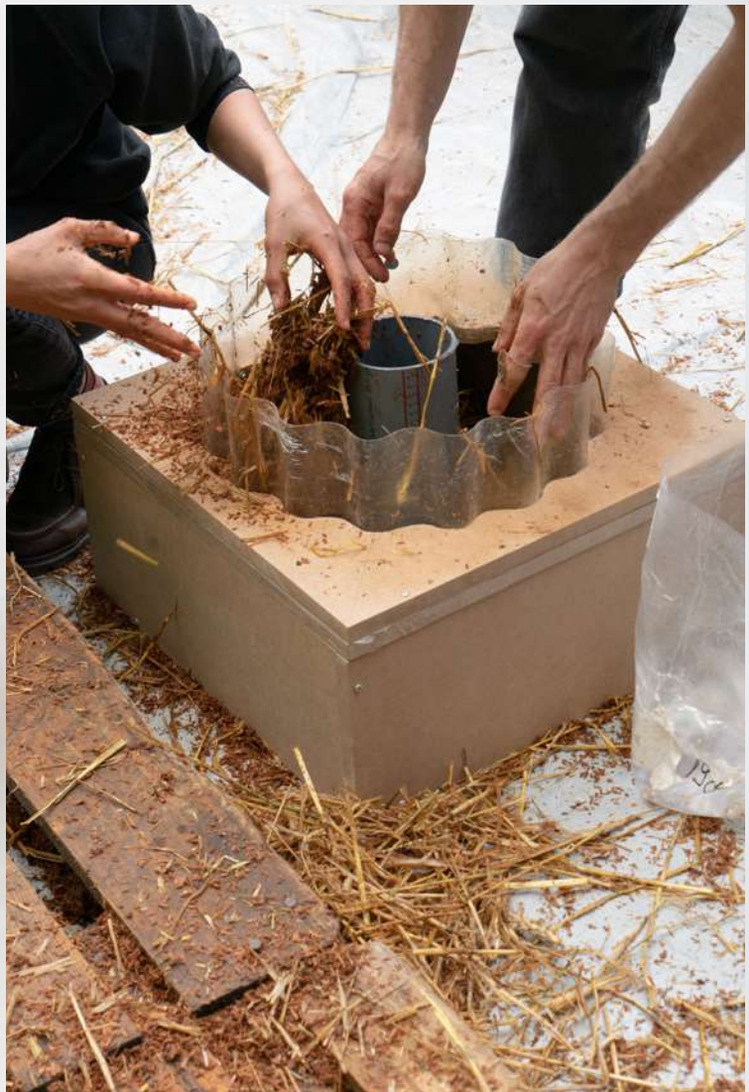
Put the substrate bundle in the cold-water lime bath making sure it is entirely covered by water. Take a brick or something heavy and place it on it to prevent it from floating. *Leave the bundle in the bath for a least sixteen hours.*

# STEP 4

When the lime pasteurization is over, take the bundle out of the water. Place the metal grid on top of your cold bath container (you can also hang it from something) and place the bundle on the grid so that the substrate drips off. Leave it to drain for at least six hours. This time frame is related to your volume of substrate; a smaller volume will dry faster and vice versa.

*If the substrate is too wet, there's a risk of asphyxia for the mycelium as the substrate will lack oxygen. If the amount of water is too low, there's a risk of it drying up.* You can test whether the substrate is too wet by taking a handful of it and pressing it in your hand. If no drips come out, the substrate is good to use.

Aerated substrates made of a higher proportion of straw than sawdust will drain faster. A denser substrate made of a higher proportion of smaller and denser materials like sawdust or wood chips will need longer to dry.



# STEP 5

Take your mould. Disinfect it inside and out. Disinfect your grain spawn bag, your hands and the surface you're working on. Place your bundle next to the mould. Take some handfuls of pasteurized substrate and lay a first layer (about 1 to 2 cm thick) at the bottom of your mould. Then sprinkle a fair amount of the oyster mushrooms grain spawn on top of it, making sure you'll have enough to be consistent in your distribution throughout the mould. *Repeat this step. Lasagna technique again, until you've filled your mould.*

The mycelium will act as a *natural binder* through the substrate.

# STEP 6

Close your mould and store it in a room (or small greenhouse) with a temperature of 20 to 24°C until you see the first 'primordias' (baby mushrooms) appear. This is the 'incubation temperature' and this value is only valid for oyster mushrooms as each mushroom has its own specific needs. At this stage, the mycelium doesn't need a lot of light or fresh air, you can even store it in a closet. Once the primordias are there (after about two to three weeks), the temperature can drop between 10 to 20°C and the humidity should be kept between 95 and 100% until the primordias have taken the shape of tiny mushrooms. To control the humidity, you can use a humidifier linked to a hygrometer set on the desired percentage. *From this stage onwards, make sure to increase light and air circulation so that the mushrooms can breathe better. They will reward you by being big and well-formed.*

The 'primordias' phase should last four to seven days. Then comes the 'fructification' phase, for which the temperature can stay the same but the humidity can drop to between 85% and 95%. This phase should last between 10 and 15 days.

# STEP 7

*Once the mushrooms are there, pick them and enjoy! You can eat them!* Then place your object in a dry room with good air circulation. Once your object feels dry, unmould it and leave it to dry a little longer. If some parts are still wet, it could be subject to contamination (the most common of which in our experience is *Trichoderma*).

RUINED *Workshop at EPFL, Lausanne with far°, Nyon, May 2023. Photos: Deborah Robbiano*


**1** Greenhouse installed for fruiting and drying modules. **2** Construction and filling of the moulds, inoculation of the pasteurized substrate with grains of Oyster mushroom mycelium. **3** Buckets of water to hold the substrate bundles submerged in the lime bath. **4** Zofia Chomętowska, members of the work brigades clearing the rubble of the ruins of the Church of St. Alexander in the Square of Three Crosses, 1945. **5** Filling of substrate bundles. **6** Bundle of substrate in a lime bath (cold pasteurization). **7** Elm Oyster mushrooms grown on a mould. **8** Prototype after fruiting of the mycelium and before drying. **9** Pool built for lime bath (cold pasteurization). **10** Mould built by participants in the workshop. **11** Elm Oyster mushrooms growing out of a mould.


4.
3.
5.
10.
11.