EcoLogicStudio

THE DARK SIDE OF GREEN CITIES
What if the boundary between humans and ecosystems didn’t exist? What if we could transform our waste into nutrients for other organisms? And what if we didn’t fight natural events like pandemics, but tried to work with them instead? These are some of the questions that inspire EcoLogicStudio.

Words Polina Bachlakova
Portrait Andrew Meredith

Founded by Claudia Pasquero and Marco Poletto, EcoLogicStudio is a London-based architecture and urban design practice specialized in environmental design, urban self-sufficiency and building integrated nature. For almost two decades, the team has created projects and prototypes that demonstrate the transformative potential of combining different types of intelligence – ecological, human, technological and more. According to Pasquero and Poletto, learning from nature’s intricate systems isn’t just about ensuring human survival on this planet in the face of climate change. More than that, it’s key to ensuring a good life on this planet – one that benefits all living things.

The term ‘biodigital design’ comes up quite frequently around your work. What do you mean by this, and what can it teach us?

MARCO POLETTO: Traditionally, designers have taken inspiration from nature in many ways. The formal aspect has probably been the most common source – looking at nature and trying to copy its beauty, forms and colours. But I think that today, we have resources that allow us to go one step further – which means that we can begin to really look at the way nature operates. We call the way that biological systems have evolved by nature operates. We call the way that biological systems have evolved by

CLAUDIA PASQUERO: I think that our work seems diverse because it’s often seen through a typological point of view. In fact, our approach looks at artificial and natural systems working across scales and integrating. We see this relationship between multiple scales as a necessity for going beyond the categories of product, architectural or urban design. We need to connect these ‘categories’ in order to think of ecological systems that are more bottom-up and grow a different city.

MP: Hopefully, this will have a repercussion not only on the way we understand cities – but also on the way we understand nature and ourselves. We are so used to thinking about ourselves as our bodies: our limit is where our skin ends. But we know that our bodies and minds are, in fact, interconnected and depend on relationships that are external to us. Our brain is actually not really connected and depend on relationships that are external to us. Our brain is actually not really

CP: From an architectural and technological point of view, we think it’s totally possible to integrate some systemic logic back into our current building structure. The main obstacle we perceive at the moment is more the way in which production is conceived. One of the hallmarks of modernism has also been to segregate production from our living quarters and put it away from our sight and interactions as urban dwellers. But there could be a million other paradigms that take into consideration fungi, the non-human and bacteria that are usually associated with dirt and unhealthy conditions. These things actually have incredible properties that allow us to re-metabolize some of the pollution that we produce.

MP: This points us to the idea of dark ecology.

Can you explain what you mean by ‘dark ecology’?

MP: It’s the idea that ecology is not just green. If we only look at the green side of ecology, we are trapped in an understanding that is sanitized of aspects that are essential to ecology’s functioning. It’s time that we start looking at nature and ourselves.

In contrast to the structure you just unfolded, so many of our cities are built on the paradigms of modernism – which separates humans from our built environment and from nature. In an ideal world, would you erase that paradigm and rebuild from scratch – or is it possible to effectively transform the built environment that already exists?

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comes to design, I think we need to push this

our cultural understanding of nature. When it

nature – so it should be a fundamental side of

decomposition. This is a fundamental side of

because they tend to operate in the realm of

micro-organisms, we often

not green at all. When we look at the world

aesthetics. In some cases, these aesthetics are

different kind of

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different kind of

formative elements, survival strategies and

manifestation of biological intelligence – per

when you begin to look at the way nature per

sustainable design, we often have this idea

MP: When we talk about environmental or

What role does beauty play in dark ecology?

These functions can come together in incred

that we intuitively feel disgusted by. That’s

of micro-organisms, we often

that algae are one of those organisms that

From a biological point of view, we think

biomass that we extract from algae has prop

and are just waiting to be incorporated.

On the conceptual, design level, algae are microscopio. That means that we can

create artificial habitats for them to grow in

pretty much any form or con

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present a kind of unexplored layer of the bio

that algae are one of those organisms that

It’s time we start to understand “pollutants” as components of the ecosystems of our cities’

ability until we go beyond the green paradigm and the sanitized version of nature.

That brings to mind algae, which you

work with a lot in your practice. Why are

algae crucial for the biocity of the future?

MP: At the material level, we can look at

algae as biomass and organisms that are

some of the oldest in the biosphere. They’ve

evolved to have a sophisticated biological

intelligence, which makes them capable of

growing in pretty much any environment –

even a contaminated one. For algae, contamin

ants are nutrients: algae can re-metabolize

pretty much anything. As a consequence, the

biomass that we extract from algae has prop

erties that can be used in several industries. 

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logic to the design of cities – to make them

understand it rationally, we can apply that

with AI, we can train an algorithm to behave

like that organism. And even if we don’t

understand exactly how it works. But

algae, we don’t have the limitations

that we have with large trees or other

complex organisms. Trees need a lot of space.

They need to be close to each other, otherwise

they perform very badly or struggle to survive.

With algae, we have a whole new degree of

freedom in terms of efficiently bringing living

organisms into our urban fabric and built

environment. In that way, their cultivation

can become part of our daily life.

Recently, you’ve been working with arti

ficial intelligence as a means to develop a

new green planning interface. What can

artificial intelligence enable in this case

and beyond that human labour cannot?

MP: Cities have reached a complexity that

exceeds everybody’s understanding. The

idea that a designer or a planner plays the

role of coming up with brilliant solutions is no

longer possible to imagine. It’s obvious that

no one has the perfect recipe for a city. So at

this point, it becomes necessary to figure out

what forms of intelligence may underpin the

functioning of such a complex organism – and

how we may approach its design in the future.

That’s where the paradigm of artificial intel

ligence (AI) becomes very, very interesting. It

allows us to start visualising, planning and

designing a city from a non-Anthropocentric

perspective. Rather than following the

top-down, ‘one man-one vision’ way of

doing things, AI enables us to look at biologi

cal models that help us find and distribute

resources as well as dispose of waste effi

ciently. Systems have evolved over billions of

years to do this. Now, we can train algorithms

to learn the behaviour of these organisms –

and then apply that to urban design, networks

and infrastructure.

For example, we can train an

algorithm to behave like a slime mould – one of the biological models we’re looking at

that’s really incredible. It’s a monocellular organism that creates networks to reach out to nutrients and distribute them. It’s a

fascinating creature; even scientists still don’t understand exactly how it works. But

with AI, we can train an algorithm to behave like that organism. And even if we don’t

understand it rationally, we can apply that
to the design of cities – to make them

behave similarly to that organism and reach out and distribute resources. AI can be an ally

in helping us expand our understanding of intelligence and where we can find it.

First commissioned by the Centre Pompidou in Paris and
developed by EcoLogicStudio in collaboration with the Synthetic
Landscapes Lab at the University of Innsbruck, H.O.R.T.U.S. XL
AstaIrtip is a large scale, high-resolution 3D-printed
bio-sculpture receptive to both human and non-human life.’

Influencer 59
Presented at the 2021 International Architecture Exhibition in Venice, the installation BIT.BIO.BOT is an immersive experiment in the domestic cultivation of the urban microbiome.
Located within the public green space outside Warsaw’s Copernicus Science Centre and designed for Otrivin Breathe Clean, AirBubble is ‘the world’s first biotechnological playground to integrate air-purifying micro-algae’, creating a true bubble of clean air for children to play in.

What can Covid-19 teach us about how we should design urban habitats?
CP: It starts with looking for a different paradigm, in which design isn’t seen as a means of protection from the external environment. Rather, design can become an interface that allows us to communicate with forms of intelligence. For example, when we work with microalgae, it’s not about using them: rather, we create alliances where something that is considered negative for humans is a resource for them. They don’t just clean the air: they nurture themselves with elements present in air or water. If we become more aware of these cycles and are able to read them in terms of food and energy production, then we know that the number of disrupted ecologies – such as the one that has generated the pandemic – will reduce.

MP: It still surprises me how little visual communication there is around the pandemic. If you think about it, we keep looking at numbers – the number of cases, or number of hospitalizations. It’s as if that’s all there is to know about the pandemic. But in reality, it would be very critical to explore much more complex and dynamic forms of representation that showcase the pandemic as an organism – one that moves across the urban sphere. In that sense, we would begin to discover that the pandemic is a beautiful type of dynamic system. We could learn how to manage and coexist with it more effectively. Right now, we don’t have a visual understanding of the pandemic – but as humans, our best skill is to read patterns and make our decisions intuitively based on what we understand. This is where design could contribute.

What is your vision for the resilient city of the future?
CP: Trying to understand how production is integrated and establishing a different social practice. We need to develop prototypes that allow us to interact differently with the planet. The questions for me are: How can we undo some of the segregation brought upon by the first industrial revolution? How can we deepen our level of awareness of social and cultural ecologies so that cities will be more ‘resilient’?

MP: If we look at cities from a non-Anthropocentric point of view, the question is not so much about whether cities will be able to survive. The question is whether we will be able to inhabit the urban sphere successfully to our own species’ benefit. In that sense, I think that we need to reframe what we mean by resilient cities. That’s why we talk about urban spheres as operators in a global infrastructure truly enmeshed with the biosphere – so you cannot distinguish one from the other anymore. If we understand that we are one of the many, many systems that compose this network, our vision for the future of cities will be very different. As the years go by, we’ll be able to make more specific visualizations of this network and how it behaves. We’ll be able to programme this network to recirculate material information and energy within itself successfully. This will enable us to create new supply chains that allow us to free ourselves from waste by recirculating material energy. And then, I think we will be able to get closer to what we want the future to look like.

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Maja Wirkus
In Practice