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Mabelle Plasencia: Imposing scientific character to the catalog of building materials: Part 2 [1]

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Mabelle Plasencia

Mabelle Plasencia is the creator of INmatteria [3]**: a dissection of innovative materials**. After studying abroad at IAAC and an Architecture Degree from the Polytechnic University of Puerto Rico, her inclinations towards Materials Science, Technology and the effects of both into Architecture has been her most important focus. Her continuous research about materials and

innovation is shared through a scientific and architectural point of view. Currently is the Materials Consultant for the School of Architecture of the Polytechnic University of Puerto Rico.

New materials are being created constantly. Can you give us some examples of that?

Materials evolve in all categories but I have noticed that mainly those addressing environmental awareness seem to be more successful. As I mentioned before, (link part 1 [4]) plastics will be replaced by organic materials such as Mycelium, (which comes from mycelia, the vegetative part of the oyster mushroom) or by other organic products such as tomato waste, corn crops or coconut waste. Walls can be built out of fiber plants such as Hemp (the industrial Cannabis Sativa), bricks are coming out of paper waste, bark from certain trees provide a new kind of fabric totally renewable, and many designers and architects are printing furniture and houses out of concrete. On the other hand, scientists look at nature, in accordance with Architects and Designers, to produce new structures and solutions into materials through the process of biomimicry, by imitating its biological structure, function or form. To mention a few: gecko's paws provided the design of Velcro strips; clam shells proteins provided new plastics and cephalopods' transformable skin is under study to design camouflage for military applications. Again, the revolution of materials is at large and it is impressive how it changes every day.



"Plastics will be replaced by organic materials such as Mycelium"

Which materials considered over-rated, can hold a stronger potential?
At the moment, there have been extensive studies to our oldest and most contaminant material: concrete. Scientists have proven to make it lighter, stronger, fast drying or not, permeable or not, image displaying on water contact and most recently, hydrophobic. Findings have also pointed towards smog eating concretes and carbon neutral concretes upon production. At least there are a few solutions for keeping this historic material as part of our future. Furthermore, 3d printing with concrete added to any of these great new solutions can be a possible alternative for fast construction as it is already been performed with traditional concrete.

In Puerto Rico, concrete is the most accessible local material, but yet, the production process is unsustainable. What other materials would you recommend that can leverage with the demand and performance of concrete?



Due to Puerto Rico's land condition, materials have to surpass the most stressful tests regarding lateral forces and seismic resistance, for which concrete has already surpassed it (except for its natural occurring cracks). For instance, many of our new construction is now designed with claddings for thermal purposes than just building almost completely with the same material, one might say, moving ahead of brutalist Architecture. Possibly composite materials in combination with our traditional materials, might lessen the sustainability issues we currently have. I could say that industrial hemp (if Cannabis was legalized in Puerto Rico), might provide us with better buildings, although its alkalinity would raise costs as I explained on an article [5] for **Inmatteria**.

Looking at the possibilities of plants such as hemp or seaweed, new composites can be achieved for addressing environmental issues. Hemp is currently applied as wall, floor and ceiling in Canada, mixed with cement calling it **Hempcrete**; and seaweed is used as roofing material in cold-weather countries. In my consideration we should ask ourselves and our environmentalists: which are those raw materials found in the Caribbean that can aid us in producing construction materials that can withstand the same tests as concrete does? It is possible those plants could be right before our eyes, at our own backyards?

Do you see this innovation trend as something temporary or does it mean a new way of creating business opportunities? Even for Puerto Rico?

Personally, I wouldn't consider innovation as a trend, better yet, we are currently facing a New Industrial Revolution, one that is merged directly with science, biology and nanotechnology. Technology is moving in a fast pace and it is our duty to keep up with its timing and take advantage of what it has to offer. As an Architect in Training, I have understood that there is much more possibilities behind designing spaces with health, safety and welfare. Through out my self-learning experience on materials research I realized that if Architects want to design for healthy and safe buildings from creation to use, materials would need to be addressed and welfare will come along if previous issues are confronted.

There is business in materials innovation, which is connected to product design and industrial design; talent broadly visible in Puerto Rico. Innovation creates local market movement and it is something I will always support. Many companies grow at large with young entrepreneurs who get a kick-start upon exposing their work but we have to be much more aggressive in terms of support, encouragement and of course, spreading the word.

Tags:

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