

MATERIAL MUTUALISMS

Carmen Rotondi

In biology, mutualism indicates a particular relationship between individuals of different species, which entails mutual benefit for associated individuals, without this relationship being obligatory since the two species can also live independently (Treccani, n.d). It is also called “mutualistic symbiosis” precisely to emphasise “living together”(1) as opposed to the “being together” of several entities in the same place. The interaction and permeability between the parts - rather than the individual parts - results in new functions and conditions, leading to a mutual benefit in survival.

The specificity of the mutualism concept has extended its use over the years (think of economic, political or social mutualism), and it is now necessary for the artificial’s project where the relationship between objects and objects, objects and people, objects and contexts has become particularly articulated and complex.

Today, we can affirm that we live in the

biological era, not only for the new technological possibilities but also for an organicistic perspective that is slowly spreading in the various aspects of our life, society, and design culture. We are going through what Kevin Kelly foreshadowed to be a techno-biological civilisation, in which “naturally generated and artificially constructed things manifest similar characteristics and increasingly integrate under the same law of functioning” (1994). Even Klaus Swab – founder and executive president of the World Economic Forum – says that we are going through a period in which all processes are informed by organic considerations, in which culture has become “wet” infused with a new awareness of biology and ecosystem (2018). In his book “The Fourth Industrial Revolution”, he attests that this revolution is different not just for innovations but also for transformations’ systemic nature (Schwa, 2016). They combine phenomena and technologies through physical, digital and biological domains, inviting us

to rethink economic and business models, production and consumption systems, education and environmental conservation. Furthermore, phenomena emerging from modernity (such as climatic and geopolitical crises, the loss of biodiversity, the homologation of culture, the fragmentation of the social fabric and the collapse of values) are thus impactful and on a global scale, which affect not only economic growth and social stability but also the balance of the entire ecosystem in which we are inserted – understood in the most generic sense of symbiosis of human-biological, artificial and inert “agents” (Latour, 1991). Humanity, therefore, changes its location, from a species above the ecosystem, independent and indifferent, to an active and interconnected part, which contributes like the others to the modeling and self-regulation of the Planet as a shared space to “live together”.

In this scenario, the design of artefacts, spaces, surfaces and structures represents a moment of synthesis and complex decisions aimed at “drawing together” not only the details of everyday objects but also cities, landscapes, nations, cultures, bodies, genes and nature itself, according to multi-directional, holistic and emerging models (Latour, 2009). By “emergence”, means precisely the property of complex dynamic systems to assume final behaviours given by the random, reciprocal and interdependent relationships between the parts (Bridgman, 1927). The project becomes the interpreter of a rediscovered mutuality between the different

aspects of our life. A contamination concerning forms, figures and languages; the processes of material context formation; the relationship between artefacts, the environments, the city, the metropolis, anthropized and non-anthropized territories; our body, our mind and our sensory apparatus.

The field of materials is today more lively than ever, and the emergence of new materials and approaches to design offers a surprising multiplicity of opportunities for new design experiences (Karana et al., 2019), aimed at rebalancing our relationship with the Planet and remodelling society for the better (Franklin & Till, 2018). They represent the physical interface of production and the tangible weight in terms of resource consumption and human impact on the Planet (Pellizzari & Genovesi, 2017). Still, they are also the focal point of discussion on how our built environment and the products were, are, could – and should – be (Pedgley, 2014). Indeed, the use of materials in the project is infused with great responsibility and has implications and consequences, not only of an economic but also moral and social nature: materials are possible “drivers” of social change, with the potential to alter societies for better or for worse (Ashby & Johnson, 2002).

In particular, the attraction of designers for materials lies not so much in the material itself but rather in its expressive and use potential when embodied in a product. Designers deal with “contextualized material” (Karana & Hekkert,

2010), that is, they shape and prefer a specific material, having established that its properties adapt to a particular use scenario and that its qualities offer the material experiences foreseen by the product or by the designed space. More or less consciously, their work is a balanced synthesis able to assist “both the performative and configuring character (of the materials) concerning the type of civilisation, and the symbolic values they carry” (Fiorani, 2000), giving back to matter all the constitutive complexity and plurality of the aspects: semantic, expressive, of user experience. In other words, design with and for materials embodies those moments of synthesis and complex decisions that characterise the project. Through creativity, it can combine a more technical culture with a more humanistic and critical culture. The first looks at the functionality of a material concerning the form, the production aspects and the performative needs in a given environment; the second uses it as a source of enrichment to satisfy the senses, inspire relationships and meanings, evoke feelings and emotions, provide a means that induces to act and behave in specific ways.

Therefore, the present article intends to introduce the following projects in their materiality and show how the transfer of design approaches to materials in public space design can be a proper didactic and innovation strategy that stimulates holistic thinking and applications of meaning. In fact, in the process of materializing a space’s project, referring both to the surfaces

(horizontal and vertical) and to the objects that populate an area, students are involved in an iterative exercise of analysis and synthesis aimed at capturing the different aspects of a context, to identify the relationships and to concretize a symbiotic composition. Therefore, the choice of materials with which to shape the project generates catalysis in the innovation process through the re-evaluation and enhancement of mutualism between the space and the broader context in which it is inserted: from the urban fabric to the nature of the place, to its history and communities; from local challenges to the broader concepts of sustainability, inclusion and accessibility; from the symbolic and semantic aspects to the languages you want to communicate and the experiences you want to generate

Material mutualisms between nature and artifice.

The ecological crisis and overcoming the modern natural/artificial dualism make the creative and strategic use of vegetation and local resources an essential element for conscious sustainability. If the benefit of natural capital in environmental, social, economic, health and well-being terms is now well established; it is increasingly challenging to design the image of a “new ecology” (Simon, 1981), in which animated and inanimate components of the built environment combine to characterise a unified landscape, able to provide vital support and regenerative potential to the whole ecosystem. Biological matter becomes a

design element and contributes as artificial to the project's aim and characterization. It is the case of the flooring in "DoT: Dialogues on the Tiber", in which the interaction between the concrete pattern and the growing lawn in empty interstices structures the public space into some oasis to rest, socialize, relax and passages to move through space. Similarly, in "Forum Flumen", the desire to establish new ways of living space, work in the city and interact with nature translates into the combination of inert natural materials - such as travertine and wood - with living vegetation. The latter is carefully chosen based on the biotic and abiotic factors of the place and the sensory aspects such as specific colours and fragrances. Instead, the two projects "Cube" and "Floating Ecosystems" give a more functional role to natural matter. They are floating structures housing hydroponic systems with different purposes: to shade and improve the microclimate in the first case and stimulate sharing with a system of urban gardens in the second case. Here the relationship that occurs on a material level between water, green walls and the artificial elements of the platforms extends to a broader level, between people, river and city, towards sustainable and regenerative life models.

Material mutualisms between space and context.

The context hosting the public space project is always a place of convergence between memories, expressive symbols and languages settled in the

evolutionary history of the city. Therefore, being inspired by local materials and their chromatic and geometric languages can be a source of inspiration for reinterpretations of meaning and ensuring a continuum between the project and the urban fabric. In "Rome rediscovers the Tiber", for example, the focus is on the squared lines, the simple geometries and the contrasts that characterize Ponte Milvio, translating these traits both into furnishings and flooring. The first ones are made of light concrete and black painted steel. The second is an alternation of light and dark concrete on a rectangular grid that can generate different spatial configurations. Again, in "D.o.T.: Dialogues on the Tiber", the flooring pattern is inspired by the marble pavements of ancient Roman baths found in Via Capoprati, alternating grass and concrete in grids and "dots". Instead, the mosaics of the Foro Italico by Gino Severini, in turn inspired by the Roman mosaic tradition, drive the projects "Gradient Surfaces" and "Interactive Patterns", which re-propose contemporary versions in multicolour concrete.

Material mutualisms between man and artifice.

Thanks to the increasingly material manipulation and transformation possibilities, design overcomes the classic form-function dualism tacking attention to the soft qualities and the expressive-sensorial identity of the materials. They aim to design new "material experiences" (Karana, Pedgley & Rognoli, 2014), in which the interaction

between man and the built environment is ever more intense and pervasive. The material thus acquires increasingly expressive and communicative value, also based on the control of its emotional qualities: lights, sounds, smells, and colours become matter. Exemplary in this sense are the surface projects “Contrasto” and “Gradient Surfaces”, which “playing” respectively on the contrast between the colours of the materials or on their gradient combination, create effects and sensations, as well as physical and psychological comfort for those who lives and travels the place.

Material mutualisms between real and virtual.

Technological developments and the spread of digital lead to the extension of the concept of materiality to all those aspects without their physicality. Virtual elements such as light, projections and multimedia communications interact with the physical elements of the space, enriching the experience of the users who live it. It is the case of the “Mulvius” project, which, to enhance the site’s historical-cultural heritage, make users appreciate the Latin inscription generated by the interaction between light (natural and artificial) and furnishings. Instead, the “Interactive patterns” project refers to artificial intelligence systems and visual and multimedia installations in which projections and sounds interact with interactive cubic structures capable of immersing visitors in playful and educational experiences.

Material mutualism between form and function.

Finally, in all projects, the choice of material cannot ignore its performative and functional qualities. The choice of the suitable material is a profound exercise that depends on the production and use needs, flexibility, transportability and durability of the materials in an outdoor context.

NOTES

(1) The word “symbiosis” derives from the Greek *sýn* = together and *biōun* = to live.

(2) Another essential condition is the reciprocity of the advantage that distinguishes mutualism from other forms of symbiosis, such as commensalism (in which only one species takes advantage without harming the other) or parasitism (the benefit is of one species which undermines the other).

(3) Just think of the term “Anthropocene”, coined by the biologist Eugene F. Stoermer to indicate the current geological era, given by the impact of man and his activity on the planet’s balance. Developed by the design students of Sapienza Università di Roma as part of the “The New Boundaries” project in collaboration with Technische Universität Wien (TU Wien).

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