

# Lessons found in materials

Experimental waste-based compounds point to a profitable way of respecting the environment and territorial identity. New materials made from algae, salmon skin, limestone, apple skins and fungus are being invented



Left: fabrics from The Uprooted, a project by Atelier Luma that explores the use of invasive or exotic plants in the Camargue (Provence, France) to create innovative ecological objects. Above: objects in the Marecree collection by Aurore Piette, made of sedimented limestone, sand and mud from the Gironde estuary in France. Right: the composite tiles by Mogu are based on homegrown mycelium fungus



by VALENTINA CROCI

The design profession has unavoidable contemporary responsibilities: the rethinking of production processes; the organising of supply chains from the gathering of the material to its transformation into a finished product; the disposal of products at the end of their life cycle; and the reuse of waste. In the early 2000s, the design industry made its first life-cycle assessments, which are methods to quantify the environmental impact that a product or service has during its life cycle. Today, the aim is to activate a circular economy, one that self-regenerates through an appropriate of flows of materials. This passage marks an interesting jump in scale, because it means that the planning of an economic and productive system aimed at minimising waste can be applied to small numbers and short supply chains, too.

Circular economy has entered design methodology right at the start of designers' academic training, so experiments have been appearing that involve new materials based on the waste of local industries. Their applications and the exchange they entail between diverse fields of business have not existed until now. In this approach to sustainability, waste is not only converted and upcycled, but tells the story of communities, local specificities and local farming traditions. Since 2016, the cultural centre Luma Arles in France has been exploring the use of waste materials, mostly from the region's food-farming industry. Its think-tank Atelier Luma is intent on promoting virtuous procedures on ecologic, social and economic levels. From invasive weeds and algae gathered in the Camargue, natural glue and dye are made. From tufts of Merino wool found on the Chaîne des Alpes, yarn is spun for use in the textile sector.

Different clays are studied and catalogued with the aim of incentivising the local ceramic craft. By mapping the area's materials, professions and competencies, Atelier Luma wants to favour cooperation between different fields. At the current Triennale di Milano exhibition, "Broken Nature" (until 1.9.2019), the think-tank has on display the research project *Algae Geographies* (with Algae Platform and the Medsea Foundation). It shows an alternative economy for the wetlands of Southern France, which could become an incubator for the cultivation of biomaterials. The study hypothesises a transnational initiative in the Mediterranean to forge connections between local biomaterials, manufacturers and circular, decentralised production methods. This platform would act as an aggregator of knowledge and experimentation to generate heterogeneous goods, like objects made from microalgae, 3D-printed biopolymers, fabrics dyed and printed with pigments from algae, and bio-laminates

made from algae and starch-based polymers.

Thomas Vailly, a designer based in Eindhoven, recently collaborated with Luma on the development of a biomaterial made from sunflower-processing waste. Sunflowers are used to produce oil, seeds, biofuel and animal feed, but the rest of the plant is thrown away. However, from the residue of the oil pressing, a water-based glue and a vegetal leather can be created. When the tough outer fibre is stripped from the stem, it can be heat pressed into cladding panels. The stem's pith can be used to form a natural alternative to styrofoam.

Before dealing with the ideation of a determined product, an increasing number of designers focuses first on finding specific resources in their own geographical area and developing a process of gathering and transformation of the material.

For his degree-project in textile at Central Saint Martins in London, Andrea Liu began experimenting with the tanning of salmon skins both smoked and fresh, inspired by Alaskan Native American methods of tanning. He has succeeded in obtaining sustainable and 100 per cent chemical-free luxury leather. His study included looking at industrial tanners such as Atlantic Leather in Iceland, Nova Kaeru in Brazil and Nanai-Salmo Leather in Germany. His supplier is the artisan salmon smokehouse H. Forman and Son in London. Liu weaves the strips of leather and makes modular patterns that can find application in fashion and interiors.

Aurore Piette gathers materials such as limestone, sand and mud from the Gironde estuary in France, respecting their natural sedimentary layers. They come from rock erosion and settle into deposits that are usually removed by the Port Authority maintenance crews. Thanks to Piette's operation, mutual advantages are obtained with the institutions involved. Productive synergy is generated with local artisan's workshops. Her collection Marecree has a rough aesthetic that emulates the material's formation process, as if the objects had been spontaneously created by nature.

Nikolaj Thrane Carlsen from Denmark has developed a material made of seaweed collected from the shores. He has *Zostera marina*, a species of seagrass, directly recycled by farmers on the islands Møn and Bogø, which lie south of Copenhagen. The seagrass is mixed with carrageenin, a pectin obtained from purple carrageen seaweed, to make a durable, stable compound. His inspiration comes from the traditional seaweed roofs found along the coasts of Denmark, which can last up to 200 years. The shell of his Coastal Chair is attached to a frame made of reused oak wood. Recycled brass brackets hold the shell to the frame, making it easy to separate the parts to be recycled individually.

Studio Florian & Christine from London also uses raw material supplied by the sea and coast. Its project Hong Kong Harbour/Future Sea Craft is based on organised beach-combing in the harbours of Hong Kong. With degraded ocean plastic (PET, polypropylene and high-density polyethylene), smooth shards of coloured glass, pieces of rusty metal and ceramics, they create lamps of glass and metal, screens, new solid composites and fabrics, all in collaboration with artisans. The studio has thereby put to practice a thorough process of upcycling.

In a more institutional ambit, the vegan upholstery material used for the Privé collection by Cassina has been much talked about. It was Philippe Starck's idea to fine-tune Apple Ten Lork, a covering material made of apple skins by the Frumat company from Bolzano. Frumat is specialised in bio-based materials from the food-farming industry around Bolzano. The different types of faux leather are pleasant to the touch, made from discarded apple skins and produced in a low-emissions process. In the furniture sector, but without the use of vegetal material, there is also the S-1500 chair designed by Snohetta for Nordic Comfort Products in Northern Norway, which produces it industrially by injection moulding. The chair is made from a polymer found in disused fishing nets supplied by the fisheries Kvarøy Fiskeoppdrett and Nova Sea. The recycled plastic is patterned naturally by traces of colour and marbling given by the nets.

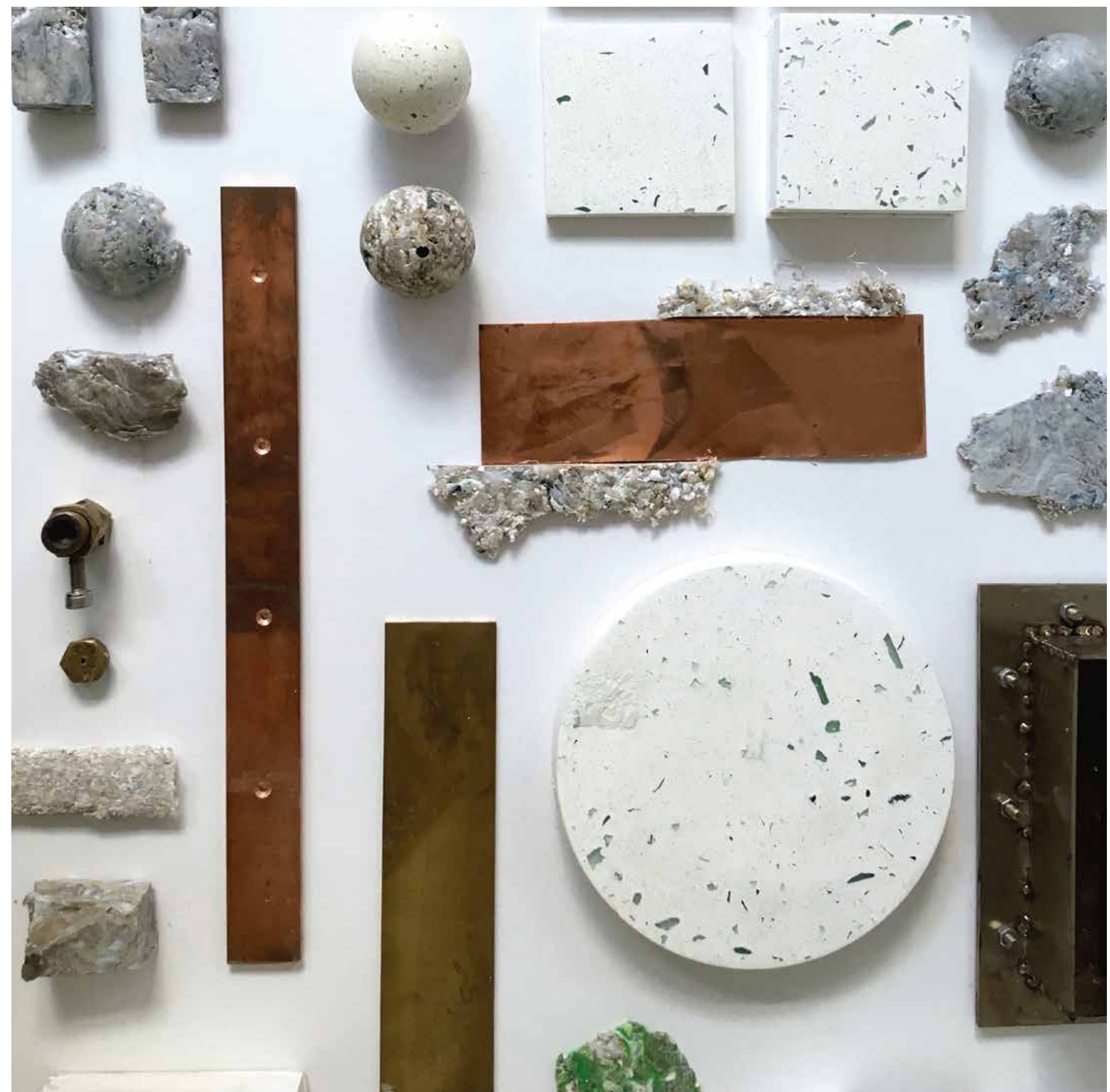
For a few years now, we have been hearing about biomaterials made of mycelium fungus. Mogu, a company co-founded by Maurizio Montalti in Varese in 2015, has concretised a study conducted by Officina Corpuscoli, one of the first to work in this direction. Mogu develops composite materials derived from organic fibres, by-products from food farming industries, and links them together with mycelium, a biopolymer that forms the threadlike "root structure" of mushrooms. By designing and configuring the growth processes of structured composites, it is possible to obtain physical properties that are stable, durable and specific. The Mogu range includes the product Mogu Wave, sound-absorbent and fireproof tiles and panels based on agricultural or industrial biomass. Mogu Floor is the name of composite tiles with a core of mycelium derived from waste fibre from the textile industry. The core is covered with a two-component bio-based resin that makes the product suitable for industrial flooring. The cladding is coloured naturally with pigment from biomass: corn cobs, rice straw, coffee grounds, discarded algae and clam shells. These products comply with European regulations and constitute a sustainable alternative to common synthetic materials based on petroleum products or limited resources.



House in Laesoe, Denmark with a traditional seaweed roof. This particularly durable type of construction is found along the Danish coasts



Nikolaj Thrane Carlsen has developed a composite made of seaweed collected from the shores. He recycles *Zostera marina* collected from farmers on the islands Møn and Bogø



The Hong Kong Harbour/Future Sea Craft project by Studio Florian & Christine from London turns degraded ocean plastic (PET, polypropylene and high-density polyethylene), smooth shards of coloured glass, pieces of rusty metal and ceramics into new objects

## In the home of design

The Triennale di Milano has changed the Design Museum formula from temporary and thematic to permanent and chronological

by CHIARA CANTONI

After 11 temporary editions, the Triennale Design Museum changes course and format: no longer large works displayed in cycles, but something permanent, a stable home, under the guidance of Joseph Grima, for a kind of archive of archives, consecrated to design culture and its protagonists. Open to the public beginning 9 April, in the large curve on the ground floor of the Palazzo dell'Arte, the new Italian Design Museum inherits the testimony from the experience of the TDM and, shifting focus from theme-based to historical-based chronological reasoning, presents for the first time in a permanent installation a selection of cult Italian design objects among the 1,600 pieces found in the Triennale Collection.

Iconic works, accompanied by mostly unique materials that recreate the design context and process, from research to production: in addition to photos, ad campaigns, and original packaging, there are also some corresponding wooden models made by Giovanni Sacchi for



Two pieces from the Triennale's Design Museum permanent collection, opening to the public on 9 April: above, Gianfranco Frattini, work helmet, 1963; right, Marcello Nizzoli, Giuseppe Beccio, Olivetti Lettera 22, 1950

the most prestigious names in architecture and design.

Watchword: to give full exposure to the collection, integrating over the next three years targeted acquisitions that, even from a documentation point of view, will recreate the broadest Italian perspective on the history of this discipline. With a *nota bene*: "Even before being a place of memory, the ambition is to be a place of inspiration, in the most ancient sense of the word 'museum', that is, the sacred place of the Muses," states director Joseph Grima. "Since oftentimes the channels of the most intense inspirations are not inanimate objects but the voices of the people who created them, we wanted to include their testimonies, asking them to describe in a simple way the genesis and cultural conditions corresponding to each object".

Interviews over the telephone, a method that embraces an idea by Vico Magistretti: "I like concept design, that which is so clear it doesn't have to be drawn. Many of my designs were conveyed over the telephone".

