

Manufacturing Landscape

Words Federico Duarte Photographs Cristóbal Olivares

It's a sunny morning in Santiago, Chile's capital. Tamara Pérez and Antonella Mele are standing in what was once the dining room of a pretty 1960s apartment building in Providencia, a mainly residential quarter of the Chilean capital. Stood in silence, they are slowly and gently applying a black, grainy substance to a bulky stoneware object placed on the table in front of them.

72



Duarte, Federico. "Manufacturing Landscape," *Disegno*, April 2017.

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Tamara Pérez examining the Lava products in GT2P's studio, Santiago.

In the adjacent room – surely a former living room – the other members of the design studio Great Things to People (GT2P) sit at laptops, scribbling on a whiteboard-top table, talking on the phone, chatting. A breeze flows through the many open windows and doors of the ground-floor apartment, which is sparsely furnished, and whose somewhat disorderly rooms reveal models, materials, bits of prototypes, tools, books, magazines. In one of these rooms a 3D porcelain printer is being installed. In the kitchen there's instant coffee and the odd ceramic cup on the counter, another porcelain printer and a kiln, where Pérez and Mele will soon place the object they have been working on. This is one of many steps in the process through which GT2P is designing a manufacturing method from a mineral both abundant and overlooked in its home country – lava.

Pérez and her partner Guillermo Parada founded GT2P in 2009 with fellow architect Sebastián Rozas and engineer Eduardo Arancibia. Víctor Imperiale, also an architect, joined in 2012. GT2P first became known in Chile and abroad for its application of parametric design to installations that it designed for public places, such as the Flat Hex ceiling for the Hyundai VIP showroom in Santiago or the Vibración Parronal structure for the Health Care Center No1 in Rancagua. Yet it was its parametric design approach to small-scale manufacturing that saw GT2P enter the international circuit of collectible design fairs and galleries. The first example of this approach is Less CPP No1, the porcelain printer stood in the studio's kitchen. This is one of the analogue machines with which GT2P has advanced the idea that parametric design is not necessarily a digital computation methodology. CPP, which stands for Catenary Pottery Printer, translates computational logics and automation processes by articulating, in real time, physical variables such as gravity or the position and number of anchor points in XYZ on a large wooden frame from which a piece of fabric (gauze, muslin, lycra) is hung. By pouring different clays (earthenware, stoneware, porcelain) over these fabrics and allowing them to drip through, the printer produces non-standard, slip-cast ceramic vessels, each displaying the delicate folds and textures of their mould.

After its launch in 2013 the project evolved in two directions. The first, Tarrugao, is a series of white porcelain vases that resemble softly wrinkled

fabric, as if held by a kind hand. In 2016, three of these vases were included in the Italian furniture brand Cappellini's Progetto Oggetto collection, and are currently being manufactured in [England](#). The second direction is CPP No2: Porcelain vs Lava Lights, a series of wall lamps and chandeliers for which GT2P perfected the casting process by controlling the clay layers and therefore the thickness and translucency of the resulting shallow, creamy white porcelain bowls. While working on these lights the studio began to experiment with lava samples collected from Chile's Chaitén and Villarrica volcanoes, performing heating and

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cooling tests, as well as using different casting materials and playing with other variables. During this process, the members of GT2P failed to find an existing set of parameters or a theoretical framework that they could work with using lava. So they decided to develop one. This was the start of Remolten, a research project that, despite its domestic, haphazard beginnings, offers a striking example of how designers can create work that is culturally challenging and economically ambitious by prizing knowledge over commodity.

When hardened, the lava that flows out of Chile's 80 currently active volcanoes turns into Andesite. This porous, lightweight black rock can be found in and around the 2,900 volcanoes that dot the Chilean side of the Andes, but also in places such as Slovakia, Norway and Mars. While working on the Tarrugao vases GT2P read online that Andesite melts at the same temperature that porcelain boils. With this in mind, the studio applied lava shavings to the porcelain vases in its kitchen kiln. The first tests revealed the Andesite samples melted at 1,260°C, not

Process

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designers such as Ettore Sottsass, Ron Arad, Fernando and Humberto Campana and the estate of Shiro Kuramata, later working with a younger generation of designers such as Joris Laarman, Paul Cockshedge and Nendo's Oki Sato, with whom they – or rather Benda; Friedman retired in 2014 – work to create “things that didn't exist before.” It is a statement that commits Friedman Benda to an interpretation of design as a forward-looking, research-led activity. Gallery representation thus provides commercial and artistic guidance to designers, but also the financial support that enables them to undertake long-term projects. Remolten, which was launched at the Salon Art & Design Fair last November almost two years after Benda's trip to Chile, is one such project. At Design Miami in December 2016 the gallery sold all the Remolten No1: Revolution Series in its booth. Orders continued to arrive in the next few weeks from collectors, but also from museum curators such as Christian Larsen at the [MET in New York \(Remolten Lights\)](#) and Ewan McEoin at the National Gallery of Victoria in Melbourne ([Stool](#)). For Benda, these acquisitions point to an “overlap with contemporary curatorial thinking”, vindicating his gallery's purpose of being “an intermediate between museums and research.” As such, a project like Remolten appeals to curators with “an interest in Latin American design, or working on an exhibition on heat, or on a massive triennial aiming for material and geographical diversity,” says Benda.

This curatorial appeal gives lie to the idea that galleries such as Friedman Benda are just retailers aimed at the rarefied, luxury objet d'art market – a world in which a lava-clad stoneware stool comes with a four-figure price tag. By financing projects such as Remolten, galleries create a framework for new designers, processes and materials to be developed, shown and found by collectors, curators, editors and, eventually, manufacturers. Commercially, this framework allows design research to happen outside the mainstream furniture and home accessories industry, while also creating a niche, nimble market for the results of that research. Culturally, however, this framework reinforces an understanding of design where appreciation of the formal, symbolic and discursive qualities of rarefied artefacts conceived for an elite overshadows a broader examination of design's

social, commercial and political impact. This conservative understanding of the discipline – on which so much of the historiography, but also the contemporary collections of decorative arts and design museums are still based – is perpetuated by a design media more concerned with novelty and

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celebrity than with the appropriateness or consequence of everyday and often anonymous acts and products of design.

Perhaps this is a curator's, editor's, or historian's predicament. A gallerist such as Benda, who claims to have “no interest in the mass market”, instead puts luxury itself in perspective. “When you have the means to acquire beautiful things, everything is a luxury,” he says, stating that “99 per cent of people” don't buy what his gallery sells as an investment, but as something that fulfils their aesthetic and intellectual expectations. In “design art” – a term coined in 1999 by Alexander Payne, worldwide director of design at the Phillips auction house – authorship, provenance and semantics matter. In this context, designer-authors, much like artists, increase the meaning and value of their work by adding a name, a story and a statement. When hailing from a peripheral country like Chile, designers are often expected to create work that through material or semantic choices echoes a local or national identity – however elusive or stereotypical it may be. These expectations render, say, Fernando and Humberto Campana's furniture as Brazilian, but not Julien Macdonald's clothes as Welsh, or any designer who works with cork as Portuguese. In a 2008

¹ See “Under the Hammer” in *Disegno* #11.



Antonella Melle pours stoneware clay into a mould.

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at the 800°C as indicated on the websites they had found. The Andesite remained in a viscous state and was still manageable at 1,300°C, the temperature at which porcelain bakes. Then, through a series of further tests, GT2P realised that by controlling the heating and cooling curves, but also the expansion and contraction of both materials, the two materials could be made to work together: the molten lava adhered to the biscuit – or bisque, a kind of unglazed porcelain – on a first firing. It also reinforced the strength and resistance of the porcelain element at the centre of the lamp, under which the studio placed an LED light and

Andesite is still being produced by Chile's active volcanoes. In a telluric sense, lava is therefore more akin to wood than sand or clay.

a capacitive sensor that acts as a dimmer. It can be turned on and off by the stroke of a finger.

The first prototypes of the Less CPP No2: Porcelain vs Lava lights were shown during New York design week in May 2014 at the Manhattan office of L'ArcoBaleno, the collectible design portal founded by Ambra Medda in 2013 (which merged with German website Pamono in 2015). During the show Parada met Lowery Stokes Sims, curator at the Museum of Arts and Design (MAD) in New York, who included the lava prototypes and GT2P's *Losing My America* collection in her November 2014 exhibition *New Territories: Design, Craft and Art from Latin America*. GT2P also applied for a grant from FONDART, or Fondo Nacional para el Desarrollo Cultural y las Artes (National Fund for the Development of Culture and the Arts), a Chilean state programme promoted by the Consejo Nacional de la Cultura y las Artes (National Council of Culture and Arts) that provides public funding for arts, culture and heritage projects. The \$20m-Chilean peso grant (c. £25,000), which GT2P received in 2014, allowed it to finance

the work of two people on the project for six months and, crucially, to buy the kiln that now stands in the studio's kitchen.

This was when the real research behind Remolten started. The first strand entailed sourcing the raw material. Unlike other rocks such as limestone or granite, which have been made over thousands of years either by the accumulation of calcium carbonate sediments or the crystallisation of magma underneath Earth's surface, Andesite is still being produced by Chile's active volcanoes. In a telluric sense, lava is therefore more akin to wood than sand or clay, from which glass or porcelain are made. Rather than extract the Andesite, GT2P collect it by driving 800km south of Santiago to the base of the Villarica volcano – or a further 500km south to the Chaitén volcano. They open the back door of their Peugeot Partner van. Load half a tonne of Andesite chunks. Drive back to Santiago. The landscape is barely touched after they leave.

The chunks of Andesite are later ground to dust at the geology department of the University of Santiago. In the mineral world lava is seen as volcanic cinder or refuse, a material of little worth in economic and scientific terms – Parada reports one of the university professors as having asked, “What do you want to use this worthless material for?” In fact, says Parada, “the most knowledgeable people about lava are security experts” who study the nature and effects of eruptions as a matter of public safety; as such, a significant portion of GT2P's publicly-funded research on lava focuses on understanding the material's properties and applications. Andesite is similar to both glass and ceramics in its silica content. When quickly cooled (as happens in nature), it becomes a sort of shiny, glassy obsidian that breaks easily. “The first tests showed lava has a very similar behaviour to glass but they didn't have a controlled cooling process so the pieces broke very easily,” says Pérez. She and her assistant, Antonella Mele, tried to make 100 per cent lava pieces by melting the material with different techniques such as sand, lost-wax and refractory concrete casting. All of these tests failed, producing samples that were either too heavy, too brittle or too messy.

Learning from its first experiment with the porcelain lamps, GT2P realised that covering monofired, pigmented stoneware with lava was



A Remolten No1 Revolution Stool being taken out of the kiln.

a more efficient research avenue than making lava-only items. Having learned how to work with a mixture of ceramics and lava, the studio needed to develop an object that: a) they could manufacture themselves; b) would position the material as the protagonist; c) would make commercial sense. They chose to make a stool. “How many lava stools are there?” explains Parada. “If you make an accessory such as a vase your object category and competition is other vases. If you make it even smaller, jewellery becomes your competition. A stool is not an accessory but a piece of furniture.” In order to make the first Remolten stool Pérez went to Cerámica ColCol, a pottery studio in Santiago that is owned by master potters Elmer Gomero and Ximena León. Gomero, who also installed the kiln in GT2P's kitchen, was crucial for developing the geometry, curvature and shape of the first stools. As GT2P was aiming to produce hollow, highly resilient objects, Pérez learned from León how to work the potter's wheel to make a revolution piece

(a vessel thrown on a potter's wheel) in stoneware clay. Meanwhile, Gomero taught Pérez to avoid making sharp edges on the top end of the form, as the lava coating would not stick to the line-thin surface that such edges allow and would thus be lost in the firing. [This info](#) also defined the curvature on the bottom end of the stool, which helps the coating stick to the stoneware surface and not drip. This coating is made from lava dust mixed with a non-toxic binder used in the food industry – the black substance that Pérez and Mele were applying to one of the Remolten No1: Revolution Series stools.

Essential to the Remolten project, however, was determining a route to market. In January 2015, the design gallerist Marc Benda visited GT2P in Santiago, having been introduced to them in New York by Lowery Stokes Sims. Benda is the owner of the Friedman Benda gallery in New York, which he founded in 2007 with Barry Friedman in order to work with “interesting people who spawned schools of thought”. Benda and Friedman initially took on



interview for *Bomb* magazine, the artist Vik Muniz pushed the Campana brothers on this point: “As a Brazilian artist, do you think you should cultivate alienation in order to preserve your tropical roots, or do you think this is irrelevant? Do you feel a need to protect your identities as Brazilian artists? I call this the ‘fruit hat syndrome.’” In what framework or understanding of design should its practitioners be faced with such a question – or syndrome?

Despite its adoption by the design art gallery market, GT2P’s work reflects less a quest for identity and more the inevitability of working with a context. The partners of GT2P – whose English-language collective name includes the subtitle “Chileno design” – were faced with this issue when they sent one of their first designs, a vase, to be produced in 2010. At that time they were obsessed with its finishing – it needed to come out perfect, “as if made by computer”, says Rozas. They quickly realised, however, that with the manufacturing options available to them in Santiago, this was unattainable. “Our value,” says Parada, “was precisely in this intersection between the knowledge we received in university, which was super global, and the processes needed to arrive at such an object.” The studio became preoccupied not by designing objects, but with designing and systematising processes defined by the people, communities, places and materials around them – to which it also added a critique of the seemingly context-free digital design process. The studio’s “paracrafting” take on parametric design, for instance, implies working beyond the screen, the manufacturing device and the object. Instead, it argues for designing and systematising processes within their own context, as determined by time, space, materials and financial resources. A case in point of such a critique is GT2P’s *Losing My America* project. In 2014 the studio worked with artisans from different regions of Chile to systematise their craft techniques and collaboratively create – using 3D scanning and printing – a collection of digital reinterpretations of iconic handcraft products. These artefacts, the materials and functions of which have been determined for generations, were remade in two halves: one kept its original configuration and finish, while the other showed the quirks of 3D-printed objects such as faceted surfaces or

a reduction in formal complexity. The resulting objects are less an embrace of a new, global design process and more a proof of resistance from local craft traditions.

Given that none of the collective’s members is a ceramicist, glass blower, stone cutter or mineral expert, Remolten saw GT2P required to develop its own intuitive, trial-and-error, interdisciplinary approach. But it was through this research ethos that a project like Remolten garnered the interest of both the Chilean state and a collectible design gallery. Such an ethos is a challenge to the exclusivity associated with the decorative arts and the virtuosity associated with craft, but chiefly to how designers make tacit knowledge explicit. In the realm of craft, the process of researching, developing and finding applications for a material involves perfecting a technique that’s a matter of personal pride, professional distinction and – potentially – a well-kept secret passed on from master to apprentice. Antonio Stradivari, the 17th-century violin maker, was described in the sociologist Richard Sennett’s 2008 book *The Craftsman* as “all over” his workshop, “popping up unexpectedly everywhere, gathering in and processing those thousands of bits of information that could not signify in the same way to assistants who were doing just one part.” As Sennett observes, “in a workshop where the master’s

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individuality and distinctiveness dominates, tacit knowledge is also likely to dominate. Once the master dies, all the clues, moves, and insights he or she has gathered into the totality of the work cannot be reconstructed; there’s no way to ask him or her to make the tacit explicit.” Sennett expands further on this in his chapter related to authority and

Process

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autonomy in craft: "In theory the well-run workshop should balance tacit and explicit knowledge. Masters should be pestered to explain themselves, to dredge out the assemblage of clues and moves they have absorbed in silence within – if only they could, and if only they would. Much of their very authority derives from seeing what others don't see, knowing what they don't know; their authority is made manifest in their silence. Would we then sacrifice Stradivari's cellos and violins for the sake of a more democratic workshop?"

Instead of a sacrifice, GT2P sees democratic access to its processes as part of its design practice. As such the studio has decided to release all the data it has collected throughout the Remolten manufacturing process – and will keep collecting as it expands the size and typologies of its products – *during its first solo show* at Friedman Benda. This move will benefit other designers and professionals but also, crucially, local manufacturers.

Chile, like few other countries, is often identified with a single natural resource or commodity. Today, a third of the world's copper comes from Chilean mines. Copper has for decades been the country's main export and has played a decisive role in the nation's economy and history, from its independence from Spain in 1818 to the short-lived revolutionary socialist government of Salvador Allende in the 1970s. Due to its relative abundance and its symbolic, even nationalistic appeal, copper is also a recurrent feature in the work of Chilean architects and designers. Could a project like Remolten present Andesite as an alternative to copper – not as another commodity destined for export and transformation in more industrialised nations, but as a material that can be employed in the design and local manufacturing of valuable products destined for local consumption and export? “You don't need to create a new industry to work with lava, the infrastructure already exists,” notes Parada. One such industry is ceramics, which has a strong history in Chile, especially around the town of Concepción in the centre of the country, although as in many other latitudes, Chilean manufacturers of consumer products with a long history and a nationwide reach have been virtually wiped out by the forces of globalisation and cheaper competition from Asia. This despite the fact that Chile, as all other countries in Central and South

America, has not yet felt the impact on its consumer market and design community of mass-produced design from the likes of Ikea. GT2? may have started melting lava to manufacture high-end ceramics furniture, but it is already considering [architectural](#) fixtures, tableware or solid lava tiling made specifically for one of the studio's architecture and interiors projects. "In projects where we design the whole concept", says Imperiale, "there's always the possibility of occupying the architecture with prototypes that incorporate our designs. We always want to do everything. I don't know, maybe we can even think of a hybrid of reinforced lava, like reinforced concrete, in large structures in public spaces."

"The future potential is huge," concludes Parad. "But I think at least a year's work is ahead of us before we can create a document interesting enough so that others can work with." It is too early to say how manufacturers and consumers in Chile will embrace lava as a material used in everyday products, but Remolten has shown that GT2p can challenge the commercial-cultural framework of the collectible design market by making knowledge design's most valuable asset. That was a major step in the process. Others will follow. END

