



#### Introduction

Trained as an architect and landscape architect, I spent thirty-five years in university teaching, latterly as the Professor of Architecture at Cardiff, before taking early retirment in 2013. Ten years before that I had discovered a new and rather esoteric fascination: capturing digital 'Data from Nature'. These had led to a range of best-selling 'mineral scarves' for Liberty of London and seemed to me (if not to others!) to have all kinds of possibilities: in architecture and interiors, fashion and products. Most intriguingly, they offered children a way of colouring drawings.

To my surprise, it was the latter that came to occupy most of my time. A drawing inspired by my cat Molly, 'furred' with an image from a black moss agate at a workshop in Albany Primary School in Cardiff in 2012, was more than promising. A 'meadow scarf', made with 6-7 year-olds at Woodside Primary Academy (below) followed a year later, and after several more workshops I decided to employ a full-time coder: together we have developed the ongoing project 'Molly's World'.

After describing the values underpinning the Studio's work, this brochure introduces the 'Data From Nature' used in many of our projects, and goes on to describe how we apply *architectural thinking* to the design of digital spaces as well as real places and bespoke products.

Professor Richard Weston



**Above**: Scarf for Liberty of London, made with an image from a 'Golden Plume' agate; child's drawing of Molly filled with image scanned from a black moss agate. **Above**: Meadow Scarf made with drawings

by 6-7 year-old children.



#### **Ethos**

#### 1. Nature

Nature, which we understand as a synthesis of all living things and the vibrant matter of minerals and rocks, is central to all our work. We use digital 'Data from Nature' directly to create architectural and interior finishes, and fabrics for bespoke clothes. We also see nature as an inspiration for form, not through superficial imitation (as in much so-called bio-mimetic design), but analogously, as inspiration for the economical use of materials and energy.

Children see themselves instinctively as part of nature, before coming to learn about divisive 'differences', between humans and the rest of nature, and between races and cultures. Until the age of around eight, they also represent the world in the same way, regardless of cultural conventions and traditions. We see in both the potential to encourage a shared culture, based on a common, scientific understanding of the wonderful richness of nature. This is the basis of Molly's World. We are not so naive as to imagine, in a world increasingly dominated by the '1' rather than the 'We' as the basis of identity, and by national cultures and pervasive commercial exploitation, that this will make rapid progress. But we see it as vital to long-term sustainability: and the place to begin is with the education of children.

#### 2. 'Thinking architecturally'

For us, 'thinking architecturally' means:

- addressing long-term sustainability, technically and culturally;
- celebrating, communicating about, and connecting with, nature through design;
- working with clients and communities, not merely for them;
- responding to, and highlighting, the 'nature' of materials; and
- combining advanced technology and craft skills.

Three examples are illustrated here, right from top.

- Scarves for Liberty of London: scanned directly from minerals and fossils, the designs reveal qualities invisible to the naked eye.
- Glass roof, made of laminated glass arches supported by 'gutter trusses' that taper in response to the flow of water, like a stream (the idea came from a memory of crossing 'The Great Divide' in the US between the Atlantic and Pacific drainage systems).
- Sundial: the fused glass face looks flat in most lights, but seen against the sun turns liquid, dissolving the bronze lines made with an 'Antique Gold' interlayer: magic!







#### **Data From Nature**

This began by chance in 2003, when I bought and scanned a large ammonite: the intricate detail and subtlety of colours fascinated me, and I devoted most of my spare time for the next several years in pursuing minerals. The Studio has a database of several terrabytes.

When I showed fabric prints of three 'designs' to a neighbour, he responded immediately by saying, 'everyone's going to like these!' Asked why, he singled out a design from orbicular jasper (right) and observed: 'You've got the cosmos at the top and the beginning of cellular life at the bottom: it's made like us.' I told him Ruskin would agree but quickly discovered that few did, least of all academic colleagues who found it difficult to respond so directly. Children have no such problem and nor, in my experience, do others willing to look, not over-intellectualise. A museum director wouldn't exhibit them because 'people would mistake them for art'.



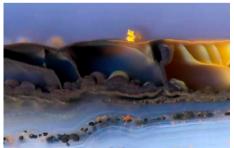












#### Molly's World (2017-)

To be launched in September 2024, Molly's World consists of a creative iPad app and a website designed to appeal to young children's sense of curiosity, and desire to learn about the world: the underlying themes of the website's content are the diversity of nature, and of human civilizations and cultures. With its subtle 'mineral paints', the app is suffused with nature, and also enables children to collaborate with others by allowing layered files to be exchanged in the same home or classroom, or across the world.

In this way we hope to help to lay the foundations for a life lived with an international outlook and concern about their fellow human beings. And by enabling children to create their own everyday goods – mugs and tee-shirts, fabrics for clothes and interiors, wallpapers and greeting cards – we hope they will be encouraged to prefer being creative producers rather than passive consumers, in thrall to systems of industrial production and mass consumption that are jeopardising their future by driving the Climate Emergency and promoting socially unsustainable divisions of wealth.

By enlisting trainee teachers in the cause, we believe that in conjunction with countless others we can slowly make a difference in the struggle for a sustainable and more equitable world, and confront the ever more pervasive conditioning by 'big tech' and its dopameine-inducing 15-second 'culture'.



This impressive application shows the way forward, not only for visual education, but for all learning.

Professor Richard Hickman, School of Education, Cambridge University

Molly's World will be an immensely valuable resource, not only for creativity but also for conservation. It encourages collaboration in a safe, constructive environment and promotes a sense that we're all in this together. It's sure to be a great resource for children everywhere.

Professor Joshua Dale, Chuo University, Tokyo



For young children, images and things come before words, and so the website interfaces are purely visual: Peter Trevitt, fomer Director of the Techniquest Science Centre, thinks they 'could do for children what the virtual desktop did for adults'. Everywhere you touch opens to a sub-menu or to content, which is presented in a range of engaging formats: journeys of discovery; animations; conversations between the all-knowing cat Molly and eager-to learn puppy, Patch; ballooning through the vast, interconnected Fields of Knowledge; postcards from abroad; swipe-through exhibitions; and animated adventures in the MollySub and aboard the MollyRocket.

















# **MollyApp** (2017-)

The creative **MollyApp** equips children with Photoshop-like tools to draw and colour, make montages and patterns, and create animated scenes and stories. Via links to the global Prodigi manufacturing network, these can be used to create an 'everyday material world' of mugs and tee-shirts, fashion and interior fabrics, wallpapers and greeting cards. Layered files can be returned to later, to develop further, or exchanged instantly via the server, encouraging collaboration – a vital attribute in the 21st century.



# Molly's World is the most excting thing I've seen in thirty years of teaching.

Steve Rees, Head Teacher, Evenlode Primary School, Penarth (now retired early).

#### **EcoProjects: campaigning for the Planet**

The launch of Molly's World will also see the first of a series of year-long projects about eco-systems threatened by Climate Change. The first, on wildflower meadows, is aimed at the UK; the others, on Antarctica, coral reefs and deserts, will be global in scope. The idea of being 'eco-warriors' is popular in schools and we aim to build on this by using, with parental permission, children's work to draw attention to the challenges posed by the threat to biodiversity. For meadows, we will focus on the plight of pollinators, on the model of the rainbows-in-windows campaign for the NHS during Covid. With the help of the Community Council this is being tested in my village prior to the launch of a National Wildflower Festival.



#### **National Widlflower Festival** (9/24-6/25)

The design of a 'meadow scarf' for HM The Queen Camilla, to be made using children's drawings following a visit to the meadow at Highgrove on 5 June, will mark the start of a year-long wildflower festival for schools, to culminate in June 2025. This is being organised in collaboration with Taunton Brewhouse, a theatre that was on its last legs after Covid but has been transformed into a thriving local arts centre by its new director, Vickie Richardson.

The Festival will involve activities throughout the school year about the ecology and culture of widlflowers, culminating next spring with sponsored visits to meadows for children from inner city schools and an event at the National Centre for Folk arts at Halsway Manor in Somerset. The celebrations will combine performances (music, dance, poetry...) and a live event in which images of wildflowers will be streamed in, via our server, montaged and printed on site, to create a vast meadow image on panels that will then be sent to enliven health and care buildings.

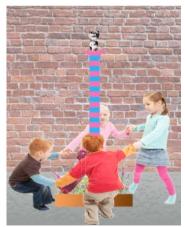
A demountable, re-usable 'MollyColumn' will stand at the centre of the Festival site. This draws on honorific columns, the early Christian column-dwelling stylites (except that Molly will send down prizes in a basket), and maypoles. Using a fieldscope Molly will transmit an image of an anamorphic meadow in a nearby field which magically transforms into an image of a butterfly meadow.









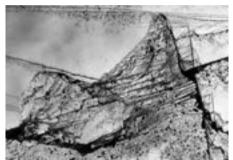


# **Microscapes**

Molly's natural world now extends to capturing the inner life of the 'vibrant matter' of minerals with a powerful lab-quality Nikon microscope. One of the most surprising and fertile sources of images are calcite rhomboids (right). Although without pigment, they can yield coloured as well as grey-scale images due to the varied paths taken by the transmitted light with which they are illuminated. So 'artistic' are they that I have ascribed them to a fictitious artist, C(arlo) Alcite: his biography and work were published in 2022 in the US art magazine *Flint*, and form 'Alciteland' in Molly's World.

Using layered stacks of images, the microscope's software can also create virtual reality files (bottom, from chalcedony): these will come into their own in the VR Molly's World described later.















#### Alciteland comes to life

By 'forcing' colour into RGB versions of apparently grey-scale images from calcite (right), we are developing a multi-episode animated story for children which describes how Alciteland has regenerated after a catastrophe like the asteroid strike that destroyed the dinosaurs (save for birds). Its inhabitants are – improbably enough! – captured microscopally from patches of acrylic paint created by squeezing small coloured dots between sheets of high-gloss paper. With their vivid imaginations, children have no difficulty in interpreting the 'natural' products of this process as strange birds and fish, and to add to the variety we undertake 'transplant surgery' in Photoshop to create hybrid, vaguely humanoid versions (bottom). They recall Commedia dell'Arte characters and life-size versions will take part in the Wildflower Festival.

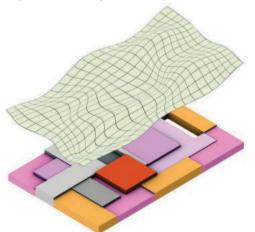




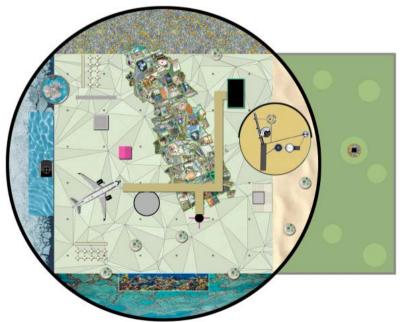
#### MollyCentre: VR world

This is a concept design for a 'real' building, to be realised initially as a VR world for children. The design spatialises Molly's World's home page into an interactive environment in which children will be able to experience both the building and natural environments such as coral reefs and deserts, meadows and Antarctica.

The design envisages a large open 'forum' with a floor generated parametrically from the volumes in the base (diagram below), the varied heights of rooms generated in the spirit of Adol Loos's *Raumplan*. The structural 'trees' are being designed by Barton Engineers using forest thinnings sold by Coed Cymru. The main volume will be tempered by underloor heating, with a cooled 'Antarctica' (left) and warmed desert (right) created using a heat pump.



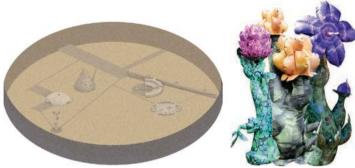




#### School roadshow and pop-ups

Working with Albany Primary School we are developing a roadshow for schools based on elements of Molly's World and our ecoprojects. Already made are two inflatable elements – an igloo and flowers – and a sandpit (a particular favourite of the head teacher: children 'excavate' a model of Molly's Desert World to discover assorted minerals, fulgurites, and Libyan desert glass).

During school holidays, elements of the roadshow will be redeployed as a pop-up, initially (summer 2025) in a vacant unit in the very large St David's Dewi Sant shopping centre in Cardiff. While children spend an hour with Molly, emerging with a freshly printed tee-shirt or mug, parents will be able to relax over coffee and cake, and learn all about Molly's World in a 'Garden Café' incorporating elements of the MollyGarden described next.

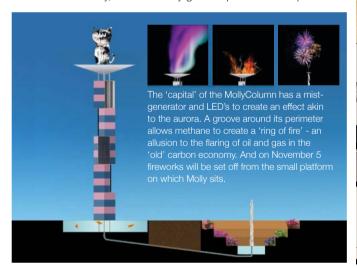






## MollyGarden

My back garden is currently being transformed into three small gardens: a 'didactic' MollyGarden, a wild garden and a tiny salad/herb garden. The MollyGarden began life as a lawn, which is being allowed to transition into a small 'meadow', within which circles of grass are 'mown' by guinea pigs housed in a long, steel-meshenclosed run along the north-west boundary. The small circles are settings for plants in pots/tubs, and the larger one for an inflatable igloo and half the sandpit from the Schools Roashow. Access is via slate stepping stones, recycled from a patio in the previous garden. The MollyColumn harnesses solar and, via a small vertical turbine, wind energy. This is used to power LED's and pump water between a small pond at its base and the collector, which will drive a gravity-fed fountain in a tiny, sunkeb 'valley garden' planted with alpines.









**Top**: MollyFrieze, with 'sea and sky' agate image, meadow made with my village school, mica sun, strizzate bird and cloud-eater and Patch's balloon.

**Above, from left:** steel grotto; igloo; sandpit; guinea pigs 'mowing' circle in meadow-to-be; steel sky-pool/bird bath. **Left:** fence between MollyGarden and Wild Garden (seen via a door viewer). Molly's Home and Museum have bird boxes in their upper half and a kaleidoscopic catoptric box below. Birdsong Molly introduces garden birds.

#### **ArtForAll**

This smartphone app blends a photo with a 'digital paint' to create a new image. Most results are rubbish, but some work beautifully – an ideal way to hone your visual judgement in the age of AI.













Daisies

Manhole cover

Road marking

Young girl in café

## **Detector app**

This app will simulate metal detecting. You define a 'field of discovery' by walking around it, scattering digital objects randomly within the field, and then seeking them out with the help of a compass, and finally digging them up with a digital trowel and saving to a gallery. Great fun for the family (especially for children after being draggged round a country house!) and valuable in schools to introduce historical periods.













# architecture • interiors • gardens • products

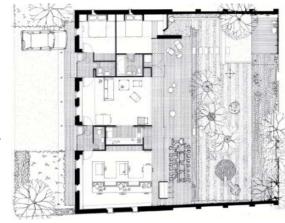
Throughout my academic career I maintained an interest in practice. The selection of projects that follows has been chosen to illustrate key themes: pushing materials to structural limits; a fascination with light and glass; 'poetic'/narrarive content. With the added skills and experience of Justine Langford, a former student with thirty years as a director of Dixon Jones, and a gifted recent graduate, Galina Lyubimova, we are keen to make 'real places' as well as 'digital spaces'.

#### Radiant House (1994)

Designed and built in twelve weeks as part of the FutureWorld exhibition in Milton Keynes, this was intended for my own occupation until the Vice-Chancellor of the new De Montfort University campus, where I was due to teach, closed the school of architecture ten minutes walk away...

The house was conceived as half of a brick-walled garden, with a stressed skin plywood roof floating over it on planes of 15mm toughened glass. Despite the serene, almost 'structure-less' appearance, it is a tour de force of structural engineering designed in collaboration with Mark Lovell.

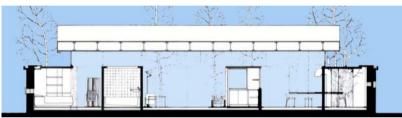
To prevent the 3.6m high south-facing glass wall bending under load, a 'louvre-girder' is hung from it and bolted to the glass, transmitting loads horizontally into concrete piers embedded in brickwork, and shading the glass to prevent solar gains in summer. Lateral movement of the entire roof is prevented by bolting it to four small triangular frames which transmit loads into a concrete frame lurking behind the plywood panelling of the low-ceilinged service spaces.

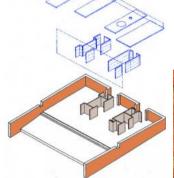






The house established themes which recur in most of the projects that follow: contrasting high and low (2 metre) ceilings; spatial continuity; a sun-shaped rooflight in the bathroom; and the juxtaposition of local materials – it sits on the ammonite-rich Oxford clay seams; a combination of site-based construction with 'local' materials and 'global' components (steel, glass and Finnish plywood); and a narrative element drawn from nature – the coral reef tiles in the bathroom, handpainted by Jan O'Highway. The house would be impossible to build now: there was no Code of Practice for structural glass, and although modelling suggested that the south-facing glass was a net source of energy it would not be allowed.









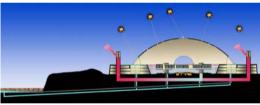


## Grand Egyptian Museum (2002)

This competition to create a museum around the remains from the tomb of Tutankhamun attracted over 1800 entries. The site is one mile from the pyramids at Gizeh, and the scale vast. I decided to counterpoint the Great Pyramid, the largest man-made stone structure, with a limestone dome of the same – 230 metres – width. The dome acted as a vast parasol and was pierced by openings mapped from the stars overhead (the ancient goddess of the night [right] is depicted sheltering people in the same way). Conference and research spaces frame a square void in which the museum was to be suspended from four service cores. The void would act as a sink for cold air, a passive system of air conditioning reinforced by traditional wind catchers to drive air through a cold storage labyrinth in the earth. Sunspots falling through the dome were to be mapped and the greatest concentrations 'carved' through the upper level of the museum to allow light to penetrate to the lower levels.

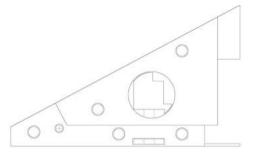


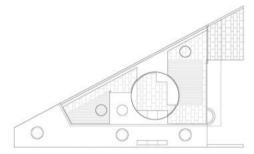


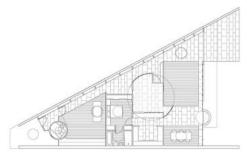


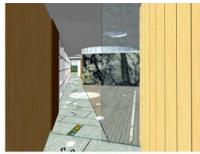










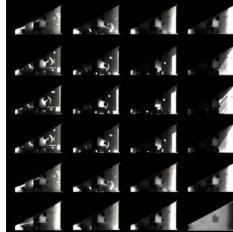






# Triangular House (2007)

The site enjoyed superb views over farmland to the north, but the long boundary walls could have only tiny windows: I decided to have none. As most light was to be admitted through the roof, I used a section similar to that in Radiant House, with two-metre ceilings to the bedroom, kitchen and bathroom, and part of the studio. A large circular opening in the upper roof created a tiny courtyard into which rooms intruded orthogonally. Drawing on the 'sunspots' of the Egyptian project, I scattered small circular rooflights in both roof planes. CAD modelling revealed an ever-changing 'calligraphy of light'. Sadly the Planners called the house 'backlands development' and refused Permission.



## House in Sully (2016)

I bought this 'backlands' site, framed by brick walls within a high-quality residential development from the 1970s, with a view to living there. Having obtained Planning Permission (and enhoanced the land value) I decided to use the money it would have needed to fund the Molly's World children's project – but continuned to work on developing the idea of a 'narrative garden' for children wrapping around the house on its raised terrace.

The model was a superb Picturesque garden, the Désert de Retz, in France. In place of its inhabitable ruined column, ice house, copper tent and gothic ruin (among forty original structures), I proposed: a steel grotto to display my minerals; a narrowgauge railway running from the entrance (in my imagination the head of the mining valleys) down to a miniature of Cardiff Bay, from where the world's finest coal was shipped world-wide; and a tiny concrete 'Jurassic cliff', embedded with fossils.

Other 'didactic delights' were a glass pyramid to celebrate quartz; a play structure in the form of a collapsed Greek temple; and – most elaborate of all! – a rabbit warren: entered from a Post Modern 'temple', it ran under the house, and finally emerged in a circular enclosure resembling an Italian walled town, its profile taken from Paesina stone.

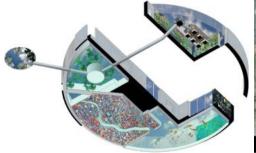






















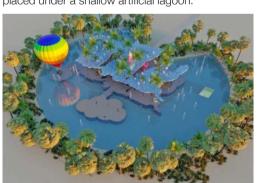
The house was to be clad in glass panels, embedded with a printed image from chryscolla, and in the interior a 'Frieze of the Four Seasons', made with children's meadow drawings, ran round the living and dining spaces.

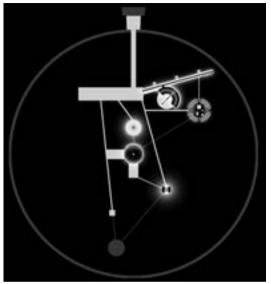
## Molly's Desert World, Qatar (2023)

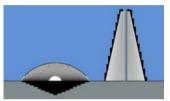
In summer 2023, I was commissioned to design an inflatable 'Bouncy Desert' play sculpture for an Expo in Qatar on the theme of sustainable horticulture in desert climates. This prompted the design 'Mollys Desert World'.

At the centre of the composition is a domed quarry housing a 'Centre for Planet Earth', and the bulk of the stone is used to build a tower with a helical ramp – a giant version of an amazing 9th century Spiral Minaret in Samarra. Inside the cone a multimedia presentation told the story from Big Bang to Solar System, experienced from 'space capsules' descending on a helical track. A ramp led to the dome to learn about the evolution of life.

Complementing the masonry architecture was a radically contemporary 'MollyCentre'. A roof canopy designed to be seen from the air was passively cooled and most of the accommodation placed under a shallow artificial lagoon.







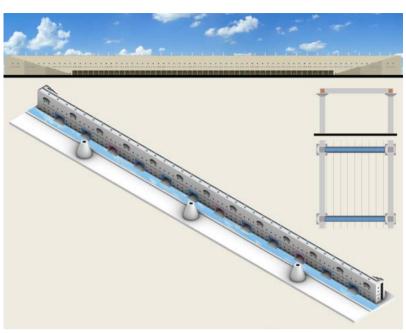




**Right**: the linear bazaar housed traditional and digital workshops and galleries, and emulated a 17th century Iranian technique for creating ice in the desert thanks to black-body radiation from a shallow, totally shaded pond. The walkways were shaded by a double-layered trellis researched for the 1992 Seville Expo, but never built.



**Above**: Centre for Planet Earth. **Below from left**: Bazaar and ice-houses; reconstruction of the Hanging Gardens of Babylon; Helical Tower and Dome; Wind Tower.





## Weston House and Garden (2005-)

My house, built in 1969 in the village of Dinas Powys near Cardiff, has become a 'laboratory' for design ideas using mineral images, and a living 'cabinet of curiosities' to display my collections. Seen here are a rug woven using an image from variscite and linen-covered wall panels - these are in the course of being fitted (the originals faded after eighteen years). The image is from Italian paesina stone, a limestone found in hills north of Florence. The tracery of cracks, coloured by manganese and iron, was created by the collision of the African and European tectonic plates that formed the Dolomite mountains. I find this thrilling.







The 'Staircase of Curiosities' holds many of my minerals. Display table is an enlargement of a piece of crazy lace agate. The aquarium is 'scaped' with Chinese dragon rocks and tree roots. Kitchen floor tiled with image of Jurassic sea floor from Madagascar, rich in ammonoids.













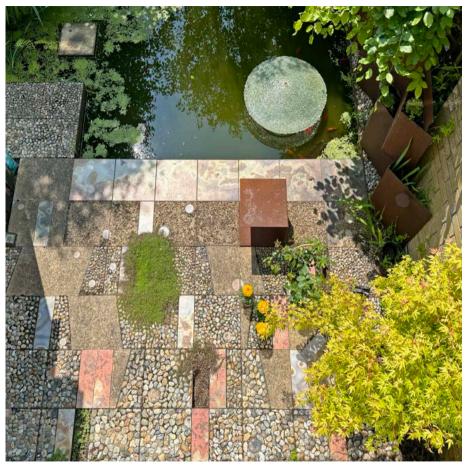






The front garden falls a metre from pavement to patio and is dominated by a large goldfish pond, contained to the north-west by a 'steel cliff' made of three interlocking layers of cranked steel. The layers peel off at right angles to create three shallow planting terraces. The planting is dominated by Himalayan birches and ferns, with marginal planting of marsh marigolds and yellow flag iris to provide seasonal splashes of colour.

The 'cliff' is a perfect canvas for the play of reflected light and creates tiny 'pocket gardens' in which succulents flourish.



A 390mm grid, determined by the porcelain tiles, regulates the patio and extends out across the pond. The patio is edged with an agate image resembling a coastline, and the linear crystals in a Moroccan agate make the 'stepping tiles' evocative of marginal plants emerging from water. The pebbles are graded from small to large, as on a beach, and interspersed with seashells and tumbled jasper pebbles. The 'Water Volcano' is made of fused shards of recycled glass.









This speculative design was proposed as an alternative to the horticulturally-driven orthodoxies of the Chelsea Flower Show, and aimed at the deep pockets of Silicon Valley: needless to say, the search for sponsorship proved fruitless. But the design was an interesting exercise. The plan was generated by overlaying a series of layers: the resulting intersections and collisions produced fascinating, 'undesignable' moments like that below, which seem to me like analogues of the richness of natural environments.







CULTIVATED CHERRY TREES.



PLANTERS FOR TREES



GLASS BRIDGES



VISUAL NARRATIVES (TILES)





SMALL FOUNTAINS



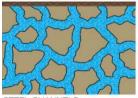
**CULTIVATED FLOWERS** 



WILDFLOWERS



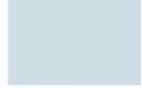
MICROCHIP CIRCUIT



STEEL CHANNELS



CRACKED EARTH



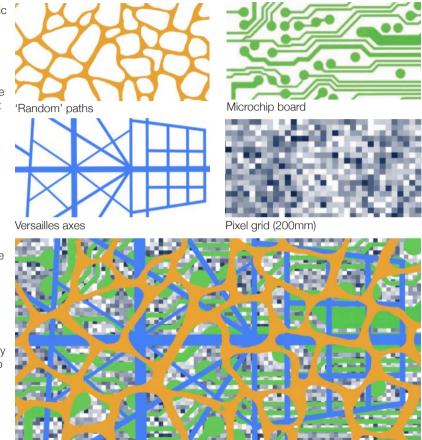
STEEL 'SIERRA'



This design was prepared for a botanic garden in China, who eventually decided to withdraw from the idea of exhibiting at Chelsea. It employed a similar 'layered' approach to composition as 'California Dreaming', and was developed around a narrative about China's role in the development of garden design in 18th century England, and in later horticulture.

The 'informal' planning of the English Lanscape Garden owed much to the discovery of the more naturalistic Chinese gardens in Suzhou, with their wandering, seemingly random, paths designed to present an ever-changing series of views. This was in striking contrast to the formality of French gardens whose influence had been pervasive, but was now seen as an alien expression of centralised power in contrast to more democratic English politics and a growing affection for the 'cultivated nature' of the farming landscape.

These geometries were overlain by two contemporary sources: microchip circuitry and a pixel grid which materialised as digitally printed tiles.



Composite layers

China, with South Africa, has been the major source of plants in British horticulture, beginning with the great 19th century plant collectors. This was used to guide the planting plan. Native plants, not yet seen in British gardens, were to be displayed in tubs against the backdrop of widely available cultivars developed from Chinese species.

Rising out of the garden were a 'Great Wall', based on the Steel Cliff in my own garden, and a reinterpretation of a traditional pagoda in steel – of which, of course, China is the world's largest manufacturer.

A network of stepping tiles, guided by the pixel grid, created intricate paths between small areas for sitting and contemplation.







# Bespoke products

Following the launch of Molly's World in September, the following will be available to order via the Studio section of the online shop on www.mollysworld.org.

**Right:** Glass Volcano water feature, made by fusing shards of recycled glass over a shallow cone of sand (with Rodney Bender of Innovative Glass Products).

**Below, from left**: Folding table with ceramic tile top (various designs available on application). Sunspot Chair made of powder-coated steel. Reinterpretation of Gerrit Rietveld's classic Zig-Zag chair: pattern of holes taken from high magnitude stars on the owner's birthday. Sweet Pea Frame with mild steel spokes and stainless steel helical cable. Available with or without steel planter.

**Next page:** Slate Plaque with raised pyrite ('Fool's Gold') design from William Morris's 'Strawberry Thief' pattern (made by boiling the entrained water in Chinese slate). Various patterns and sizes available.











