arq (2017), **21.4**, 375–382. © Cambridge University Press 2018

From a chance encounter with an ammonite, to Liberty's 'Scarf Hall', to a creative app for children called Molly's World, and virtual realities captured from microscopic mineral-worlds.

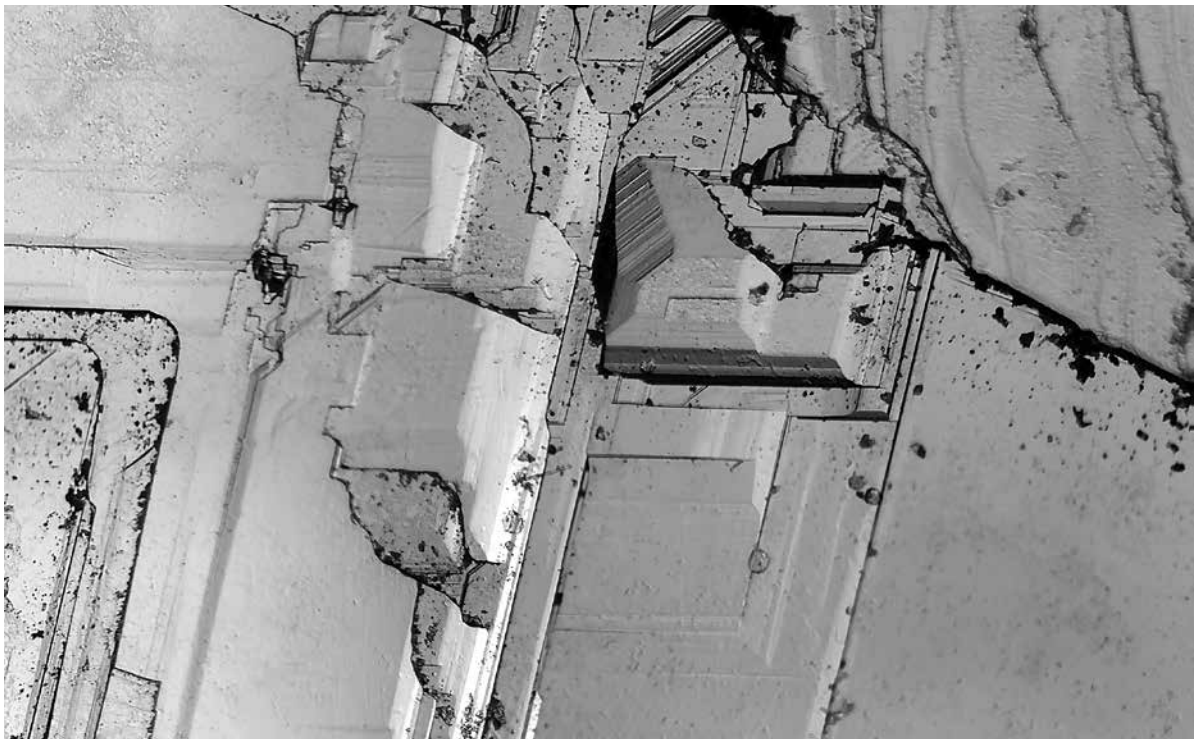
Architecture and nature: reflections from active retirement

Richard Weston

Richard Weston – Editor of arq from 2004 to 2013, best known for his distinguished monographs on *Alvar Aalto*, *Modernism*, and *Utzon* – reflects here on his more recent practice-led research into minerals, materials, and digitisation. These studies explore the qualities of materials themselves, but also the materialisation of imagery. This work is 'practice-led' in the way that the term is used in academe – meaning research that emerges out of a series of investigations – rather than 'practice-led' in the way architects might understand the term, as emerging from a professional office. As Weston reflects, however, this is work that would – most likely – be supported neither in the contexts of academe nor professional practice. It has been made possible instead by his 'active retirement'. This article explores how a chance encounter with an ammonite led Weston to Liberty's 'Scarf Hall', world-renowned in global fashion, a creative app for children called Molly's World, and virtual realities captured from microscopic mineral-worlds.

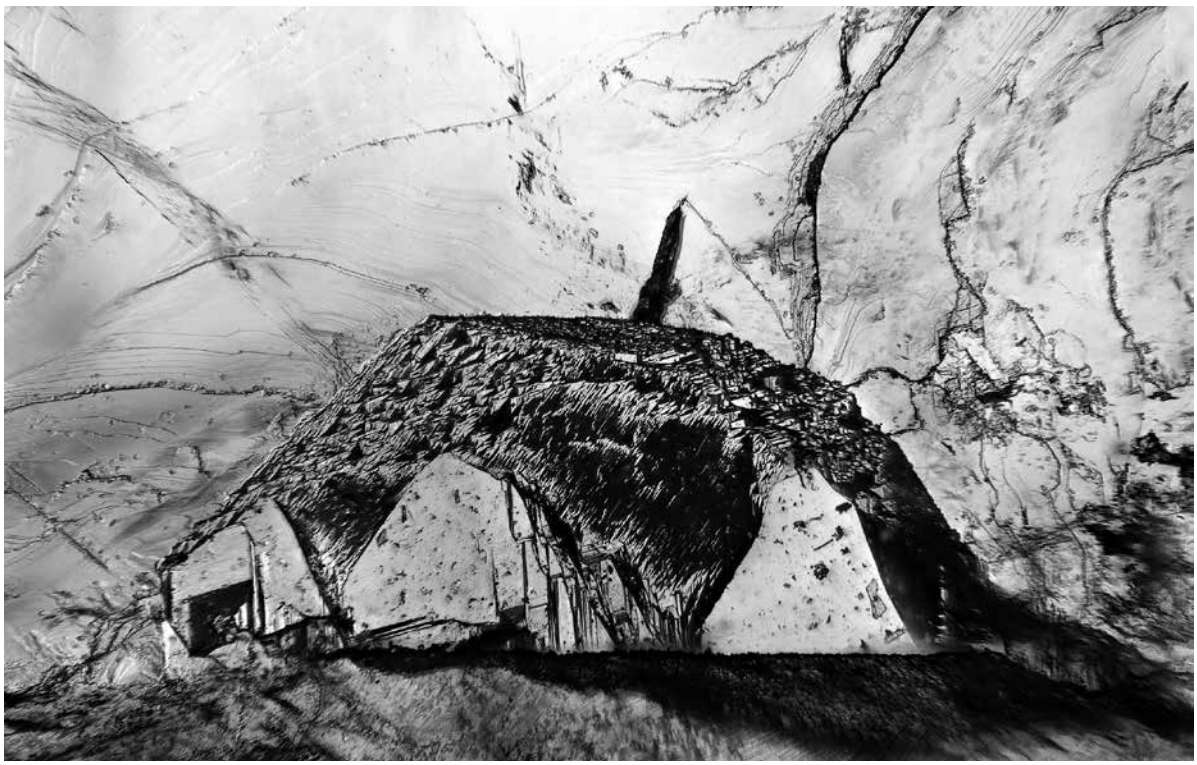
I was late to embrace digitisation, still lugging around carousels of glass slides when most lecturers carried only a pen drive. Finally, in 2003, I began to play with a digital scanner, looking at leaves, feathers, and other items gleaned from hedgerows. Then, wandering through one of Cardiff's many arcades, I bumped into a shop called 'Crystals'. It sold minerals and fossils, mainly as jewellery or for their alleged healing powers, and in the window was a large ammonite that I instantly knew I had to buy. It was not the exquisite logarithmic growth spiral or the perfect S-shaped 'lines of beauty' that separated its chambers that captivated me, but the olive-green and deep, crimson-red mudstones filling the voids and sparkling with what I later learned were flecks of golden calcite *[1a–d]*.

Back home, I placed the ammonite on the scanner but the result was dreadful, a muddy brown shadow of the original. The blame, I suspected, lay not with

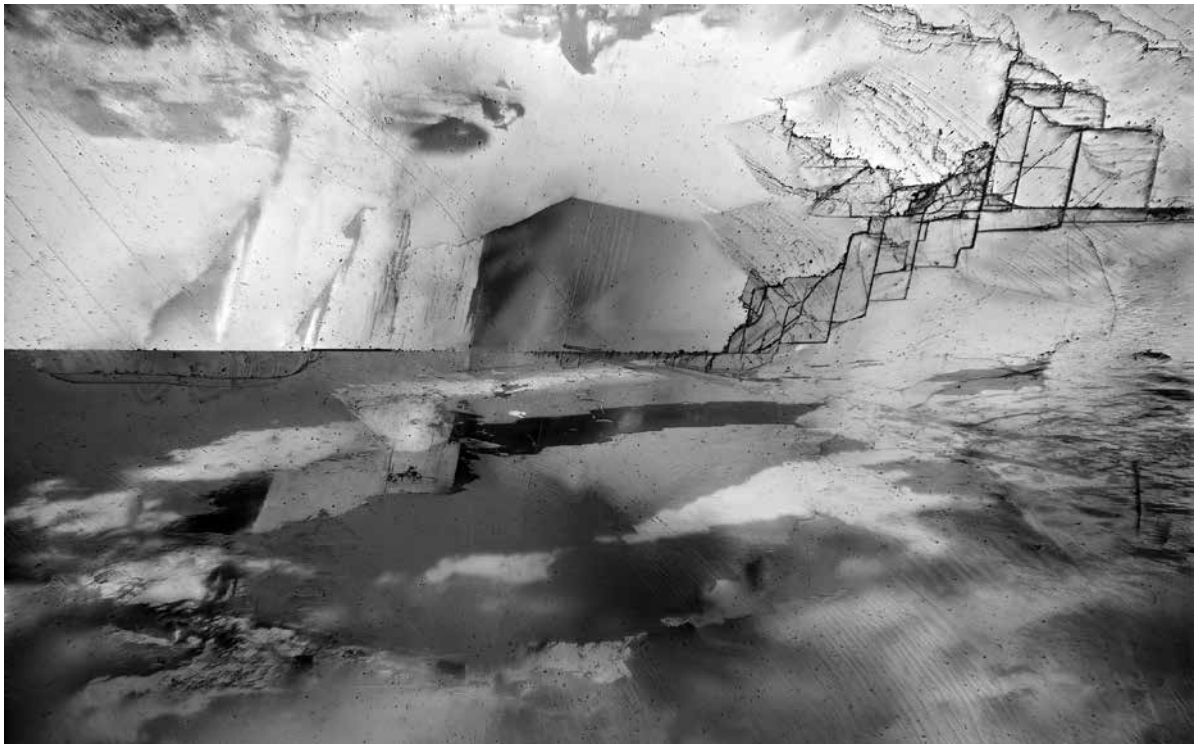


1a

doi: 10.1017/S1359135518000039



1b

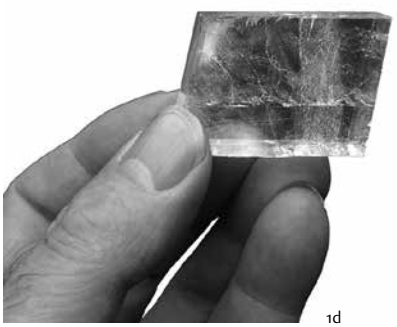


1c

nature but technology: the scanner cost less than the ammonite, and I decided to buy one of the best that Epson could then offer. The result was a revelation. Thousands of minerals and fossils were eventually subjected to digital scrutiny, gradually transforming my house and garage-studio into a cabinet of curiosities *[2]*. I have learnt a little about mineralogy along the way, but even experts do not understand in detail how minerals like agates form and my fascination remains essentially visual.

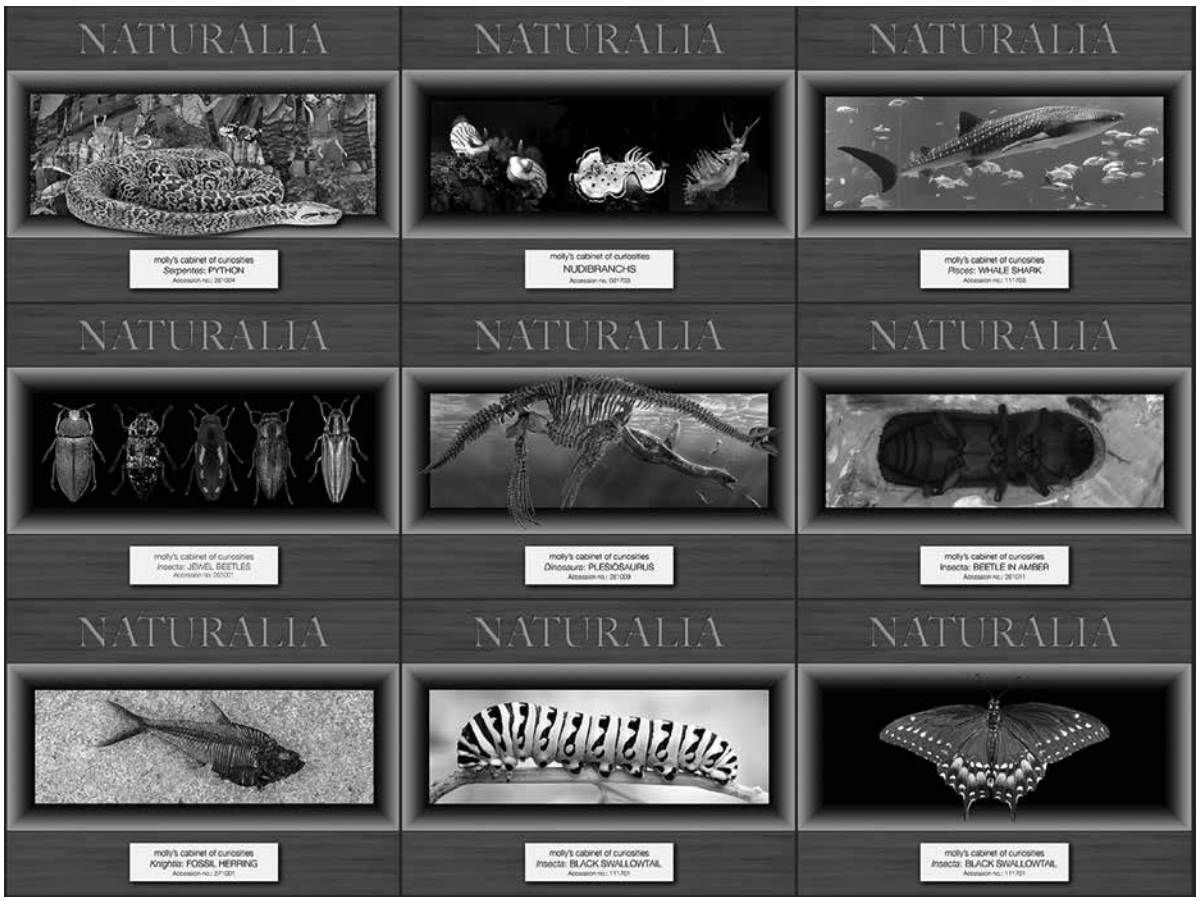
Shown an image from an orbicular jasper, a neighbour exclaimed, 'Everyone's going to love

1 *a–d* Calcite scanned at different resolutions, and the material itself.



1d

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press



2

2 Cabinet of Curiosities.

3 'Frocks From Rocks'.

these.' Asked to explain, he went on: 'They're made like us. You've got the beginnings of cellular life at the bottom, and the cosmos at the top.' Such reactions are, in part, a result of our need to tame the unfamiliar by finding meanings through association, bringing to mind Leonardo da Vinci's advice to painters in need of inspiration to 'look at a wall splashed with a number of stains' or – less frequently quoted – at 'stones of various mixed colours' where they will find 'resemblances to a number of landscapes [...] mountains, rivers, rocks, trees, great plains, valleys, hills'.

In a radical re-evaluation of Renaissance aesthetics, Hellmut Wohl points out that in Renaissance writings it is 'not uncommon to find greater responsiveness to the aesthetic properties of materials, especially of coloured marble and mosaics, than to works of painting and sculpture.'[1] It was reassuring to find that I was not alone. As successive images appeared on screen they felt to me like insights into 'the nature of things' and I could readily identify with the French poet and doyen of *pierres* Roger Caillois, who saw in them 'not beauty [...] but lasting standards and the very idea of beauty, I mean the inexplicable and useless addition to the beauty of the world.'[2]

At that stage I had no thought of applications for these natural revelations and it was eventually at the prompting of a friend that I began to consider an


3

obvious use, in fashion. I ran a project with a local fashion school called 'Frocks from Rocks' *[3]*, and the keeper of geology at the National Museum suggested an exhibition of prints and fabrics. This was quickly scuppered by the Director whose background was in contemporary art and who said 'he couldn't position the work intellectually'.

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press

For an outsider, the world of fashion proved impossible to penetrate until, in late 2009, the newly-appointed American head buyer at Liberty Ed Burstell announced that they would be running a series of 'Open Calls' for new products. I attended the second, which was filmed as part of a BBC2 television series, 'Britain's Next Big Thing'. My mineral scarves were among a dozen of more than six hundred potential products to pass the quality and originality tests *[4]*.

Although I mostly collected flat, coloured mineral specimens, I also became fascinated by the 'architectural' forms of others. A large specimen of pyrite seemed like a sketch for a house by Peter Eisenman, while others brought to mind Malevich's *architektons*. Cardiff University happened to have one of the UK's leading centres for Advanced Manufacturing, replete with 3D scanners and printers, and so I decided to try to bring my passion under a more obviously 'architectural' umbrella and applied to the then AHRC for a grant to explore my collection in 3D. The expected rejection was followed by a letter informing me that the application had been placed in the lowest category and that I should not waste their time with another.

The world of fashion also proved not to be quite the paradise it initially appeared. The scarves sold well – among Liberty's bestsellers, in fact – but although I had by then amassed some 3,000 source images, few were sufficiently 'designerly' to pass muster as scarves, and even many that did were deemed too similar to previous offerings. Where I admired the subtle changes of colour and formation in banded agates, fashion demanded more striking variations.

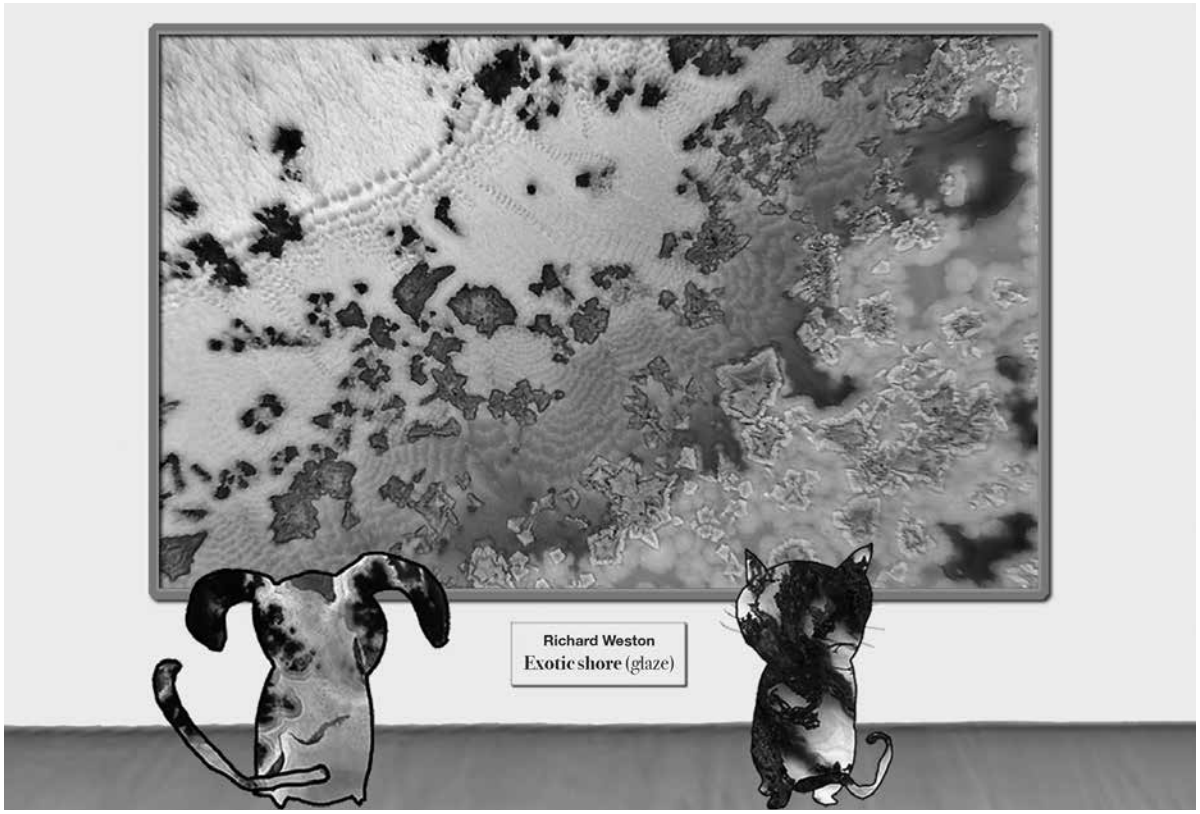
At home, I experimented with interior design applications. My living room now features linen-covered wall panels printed with an image from paesina stone, a digitally woven variscite rug, agate-covered sofa, moonstone curtains, and a crazy-lace-agate ceramic table, and I cook while standing on a greatly enlarged piece of Jurassic sea floor printed on porcelain tiles. The interior designers I approached did not share my enthusiasm – now, simulated agate and other mineral walls are common, large suppliers having stepped in.

Architectural patronage was equally thin on the ground, save for the London practice Patel Taylor

4 Scarves displayed in Liberty's Scarf Hall.

4

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press



5

5 Exotic Shore, exploring digital prints.

6 Garden, featuring digitally-printed tiles.

who used four, two-storey high images in the foyers of their Olympic apartments, and a 'sea and sky' agate to enrich the glass louvres of a house in Camden. To afford UV protection, the image was printed onto fine organza silk and laminated into glass. Shortly after, a German chemist perfected a means of printing stably directly onto glass. The house won the Sunday Times's 'Small House of the Year' in 2012, but the commission led me nowhere.

From images to 'paints'

Not having the money to promote commercial applications of my database, I began to look again at the many 'messy' images and realised that some might work as what I now call 'digital paints'. With an artist-friend Ruth McLees I ran a couple of sessions drawing cats and dogs in a Cardiff primary school *[5]*. The results were staggering. When I showed them to Ed Burstell he gasped and said, 'They can't be by children!', leaping out of his chair to take a closer look.

The 'naturalness' of the children's coloured drawings reminded me of Ruskin's thoughts on 'The Nature of Gothic', especially his reflections on *changefulness* – for which the variety of Nature was his model – and the *savageness* that came from allowing craftsmen to work free of imposed designs.[3] Young children's work frequently exemplifies these qualities: untroubled by self-consciousness, they and the things they create are suffused by a unique kind of freedom.

I sensed I was 'onto something' but it was not immediately clear how it might develop. The answer,

6

of course, was as an app. By then it was 2013 and, in UK universities, the next REF (the Research Excellence Framework, aiming to measure research quality) was a year away. I had no 'returnable' publications and nothing I might rustle up would plausibly fit the 'Built Environment' category that my institution, Cardiff University, submitted to. Propitiously, I was due to turn sixty in May and early retirement was a possibility. The pension was more than adequate for my needs, and with the 'pension pot' I sorted out my house and front garden, equipping the former with a 'staircase of curiosities' to house a good part of the mineral collection and the latter with the pond I had longed for since childhood but never got around to making – and which, needless to say, features more digital delights in the form of printed tiles.

The images for the garden were captured with my major indulgence, an optical microscope about which a brief technical diversion is in order *[6]*. In addition to a powerful zoom lens and purpose-made Nikon digital camera, it is fitted with a moving stage

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press

and motorised focus drive, both operating to an accuracy of less than a micron. The former enables truly massive images to be accurately stitched together – no architectural surface is now safe from mineral adornment! – while the focus drive allows vertical stacks of images to be captured, processed, and outputted as vector-based VR files with corresponding JPEG texture maps.

Nature, happily, did not disappoint and I experienced for myself Robert Hooke's thrill at discovering the intricacies of nature, related so vividly in his classic *Micrographia*. Surprisingly, translucent calcite rhomboids (Iceland Spar) proved especially beguiling. I have over 4,000 images from these, of which several hundred seem to me worthy of having been made by an outstanding draughtsman. I decided to call him Carlo Alcite, imagined as a lost seventeenth-century master whose work is due to be featured in a new American art magazine, *Flint*, next year *[7]*.

7 *a* Alcite Aqueducts. *b* Tortoise at the Gates of Dawn.

7a

Molly's World is born

I hoped to write a monograph on Alcite and found a publisher who loved the images but couldn't quite believe there was a market for the book. However, increasingly, the children's app – christened Molly's World – came to dominate *[8a]*. I found someone, Joe Offside, for whom coding and mastering complex software are second nature, and alongside the app a final-year Computer Science student took on the design of a supporting website as his thesis project.

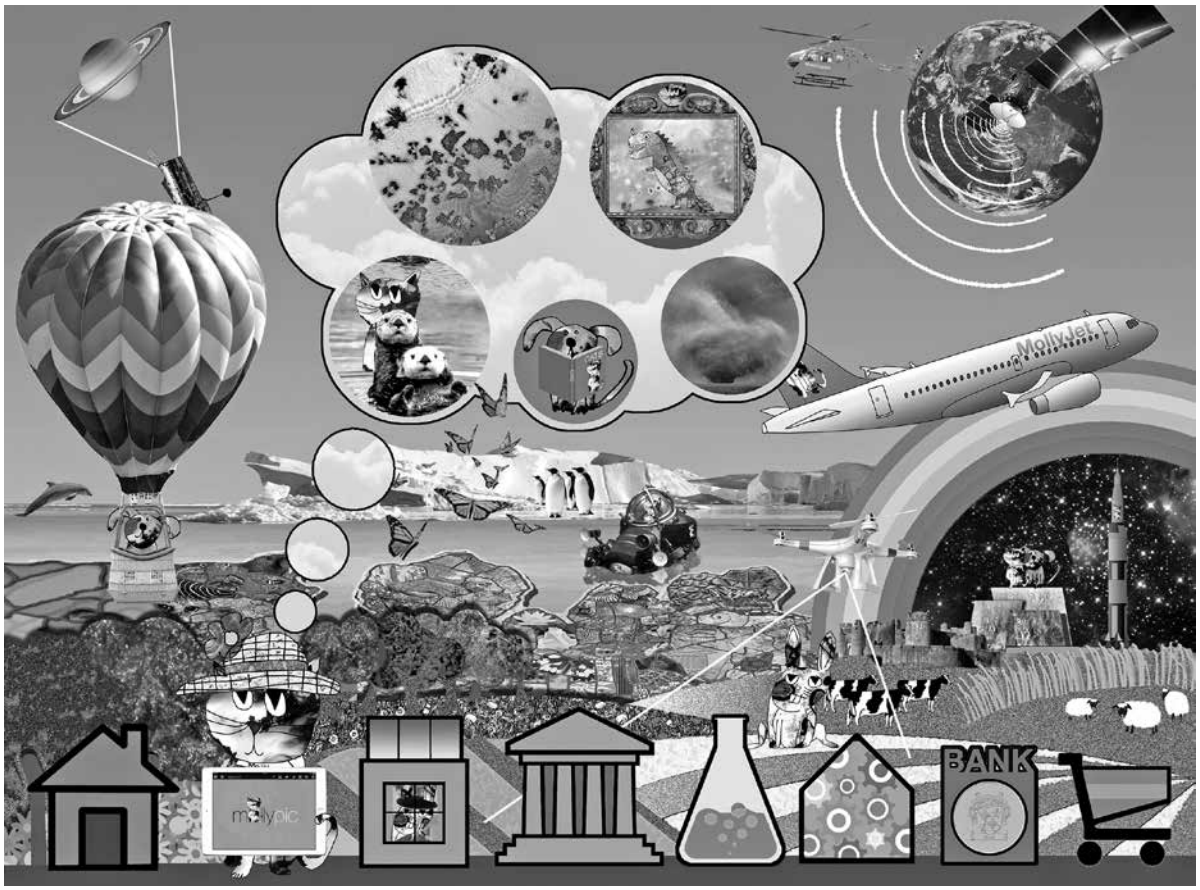
Doubting the relevance of orthodox web design for children, who wish to play and explore, not do anything 'efficiently', I based the interface on an experience some twenty-five years earlier watching a friend's young daughters react to an etching by Anthony Gross. Where I was captivated by the Jackson Pollock-esque 'cosmic' swirls of weed, the girls delighted in the tiny fish and crayfish, mayflies and dragonflies, water boatmen, and other inhabitants of what was an accurate 'portrait' of a few square metres of a stream. Ruskin again came to mind, this time with his idea of 'ornament and distance'.

Like medieval stained glass, the home page of Molly's World communicates purely visually *[8]*. I also drew strength from early Enlightenment thinking on education, notably the Dominican philosopher-friar Tommaso Campanella's utopian *City of the Sun* (1602), organised around concentric rings of walls covered in paintings of planets and plants, minerals and insects. The walls, he said, would enable the city's children to 'come to know the sciences pictorially, before they are ten years old' – and 'without effort, merely while playing'.[4] In place of walls and paintings we have the Web and digital images. I began to think of Molly's World as an 'antidote to the National Curriculum' and the national obsession with testing. When I showed the prototype to a former Director of Education at Cardiff's hands-on science centre, Techniquest, he said he had seen nothing like it and speculated that it might do for children what Apple's virtual desktop did for adults.

The head of a local primary school, who shares my 'curricular doubts', invited me to run an after-school

7b

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press



8

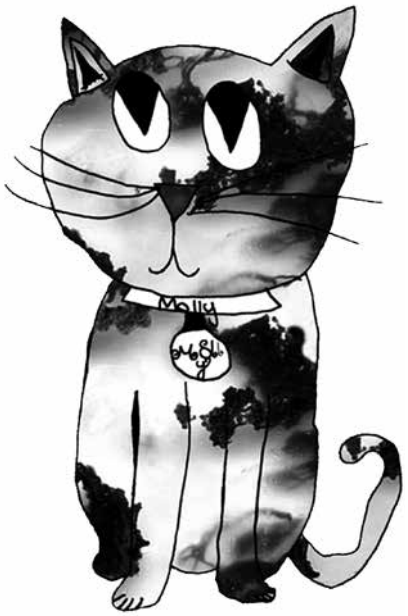
'Digital Club' and to my delight the children proved acutely responsive to the subtle 'changefulness' of the digital paints, so different to the crude primaries commonly served up to children. A girl who was prompted to replace a uniform red with a mineral one in a drawing of a mushroom gasped at the result, sat back and declared, 'Now it looks alive.' And, it did.

App and website have now merged and we are still developing the content and varied ways of presenting it. The Beta version should be out in February 2018 and the overall structure is in place: everywhere the children touch on the home screen – even the sky – will lead somewhere, and Molly herself miaows when tapped and purrs when stroked *[9]*. Her Museum will be a series of spaces generated by spherical CAD renders that the children can turn around in, and move through, using their fingers. Other exhibits appear framed on flat 'walls', accompanied by a brief conversation between Molly and her canine friend Patch. Children can upload their work into Sansovino-style frames, and there is an ever-growing Cabinet of Curiosities behind whose drawer-fronts lurk all manner of delights.

The MollyJet will be the children's gateway to travel, taking them on City Breaks and Nature Safaris, while Molly and Patch are on perpetual holidays from which they send back informative postcards, personally addressed to each child. When touched, Patch's balloon rises, burners firing, and drifts across the 'Fields of Knowledge' where it lands on a random destination, the start of an endlessly branching Journey of Discovery.

8 Home screen of Molly's World.

9 Molly herself.



9

At the core of the app is the original drawing app, now called MollyPic *[10]*. It enables children to draw and colour, transform photographs, make montages and create repeat patterns, equipping them to participate in the Digital Revolution as producers not merely consumers. A range of personalised t-shirts, mugs, greeting cards and, more ambitiously, gift-wrapping paper, wallpaper, and fabrics will be only a touch away. When the Head of Textiles at Cardiff Art College saw a fabric made with six- and seven-year olds' drawings of flowers, she suggested I take it straight to Selfridges.

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press

10 The studio of MollyPic.

Having tailored the app to children, I was delighted when Andrew Mead, former Reviews Editor of *The Architect's Journal* and valued 'critical friend', suggested that a version for adults might well find an audience. Forsaking the flatness of the screen and swipe-through image galleries, what has emerged, I am tempted to say, is a restructuring into architecturally conceived places, not graphically arranged pages. The difference seems to me striking, but only time will tell if others value the approach.

Virtual realities

From the outset, I hoped that Molly's World would have an Alice-in-Wonderland quality and, fittingly, this has emerged from the most unexpected fruits of the microscope. Firstly, some of the 'Carlo Alcite' images are being used as settings for stories and silent-movie-style animations, complete with exclamatory printed texts and piano accompaniment – the style is deliberately 'clunky' because it is something the app in time will enable the children themselves to do. And, secondly, the VR files produced by the 'vertical stacks' are yielding in Joe Offside's hands magical, fully three-dimensional 'Micro-Worlds' captured from a few millimetres of mineral or rock. We are developing videos and immersive Virtual Realities to be presented as mysterious planets populated by creatures that will be hand-modelled and photographed by children, and then turned into CAD files using photogrammetric software.

Molly's World is unlikely to compete with Minecraft and other addictive games, and I certainly don't have the money to promote it in a similar way, but whatever its success on the open market we are working with people in the NHS and in schools who see therapeutic and educational ways of putting it to good use.

For all that seems new in the work I have outlined, my 'active retirement' has, in fact, offered me the freedom to return to my first love – the 'architecture' and beauty of nature. The last few years feel like the most productive and enjoyable of my life, and it all began with that instinctive reaction to an ammonite. For me, the scanners and the microscope have amply fulfilled Walter Benjamin's hope that new optical technologies might help us recapture a child-like sense of wonder at nature. My unsystematic approach would never appeal to academic grant-giving bodies, who increasingly seem to expect the outcome of research to be outlined in the application, but I like to think that universities made space for liminal endeavours before the accountants took control.

Notes

1. Hellmut Wohl, *The Aesthetics of Italian Renaissance Art* (Cambridge: Cambridge University Press, 1999), p. 153.
2. Quoted by Marina Warner in 'The Writing of Stones'. Online at: <http://cabinetmagazine.org/issues/29/warner.php> [accessed 11 December 2017].
3. John Ruskin, 'The Nature of Gothic', in *Stones of Venice*, Vol II, Ch. VI (London: Folio Society, 2001 [orig. pub. 1851]).
4. Tommaso Campanella, *City of the Sun: Or, Civitas Solis*, trans by. Thomas W Halliday (Seattle: CreateSpace Independent Publishing Platform, 2017).

Illustration credits

arq gratefully acknowledges: Author, all images

Author's biography

Richard Weston is Visiting Professor of Surface Design at Cardiff Metropolitan University. He retired as Professor of Architecture at Cardiff University in 2013 and now runs a small multi-disciplinary studio.

Author's address

Richard Weston
richard@richardwestonstudio.com

https://doi.org/10.1017/S1359135518000039 Published online by Cambridge University Press