

Tech to transform sports, commuting, veg gardening, card games, even curtains.

# Gadgets

by Caramel Quin

**HANDS-ON  
REVIEW...**

... [bit.ly/eandt-gadgets](https://bit.ly/eandt-gadgets)

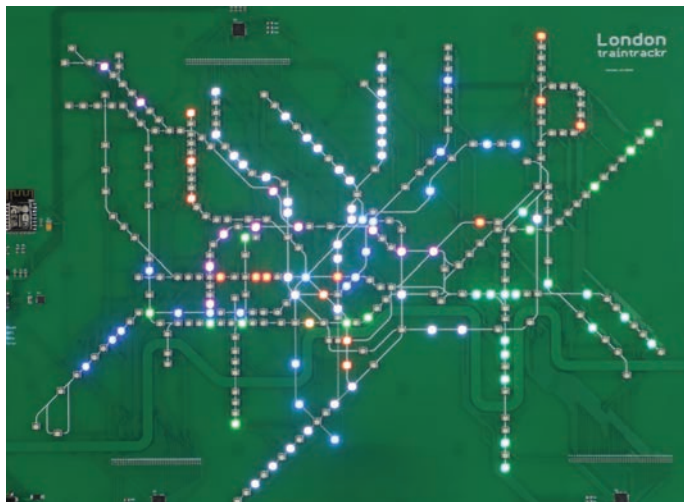


## **Huawei Watch GT 3 Pro**

**from £299.99**

A top-notch watch with enhanced dive abilities and more sports and wellness apps than ever. Available in titanium (for a 14-day battery life) or ceramic (the world's first ceramic smartwatch). The screen is stunning, like an infinitely customisable high-end watch.

[huawei.com](https://huawei.com)



## **Traintrackr London Underground**

**£249**

Traintrackr's gloriously geeky visualisation of live data is more art than journey planner. This London Underground map features 333 RGB LEDs that update ten times a second, thanks to a Wi-Fi connection to live data from Transport for London. The company also makes digital weather maps.

[traintrackr.co.uk](https://traintrackr.co.uk)



## **SwitchBot Curtain Rod 2**

**from £85**

I, for one, welcome our new robot overlords, so long as they open and close the curtains for me. This clever retrofitted bot physically sidles along your existing curtain rail, with iOS and Android app control, IFTTT, scheduling and voice control. "Alexa, pull yourself together!"

[switch-bot.com](https://switch-bot.com)



#### Garmin Varia RCT715

£349.99

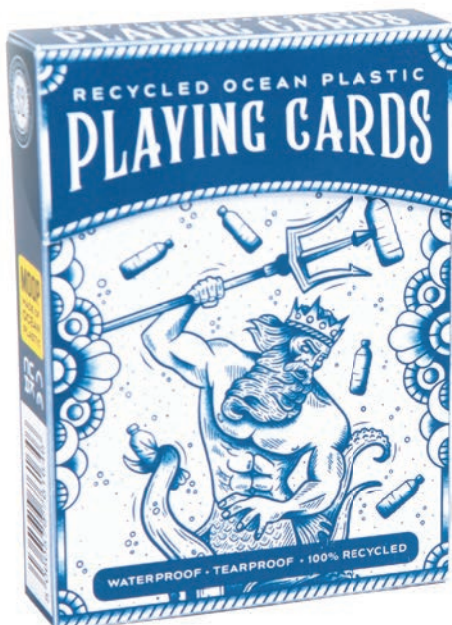
The first cycle tail light to feature a rear-view camera with radar. Radar alerts you to vehicles approaching from the rear up to 140m away, while the camera captures 1080p HD video and automatically saves footage of incidents. The bright tail light means you're visible from up to a mile away. [garmin.com](http://garmin.com)



#### Prêt à Pousser Multo

£249-599

Less hydroponics planter, more stylish Scandi furniture that incorporates a mini farm. You can have up to three layers, to feed a family with greens. Successfully Kickstarted and from an established French company that also makes smaller ones. [indiegogo.com](http://indiegogo.com)



#### Big Potato Moop

£7.99

Moop stands for 'made of ocean plastic' because these are playing cards with a difference. Each pack is made from 2½ bottles that were once floating in the sea. The resulting cards are rugged and waterproof as well as eco-friendly. Perfect for holidays and poker by the pool. [bigpotato.co.uk](http://bigpotato.co.uk)

The sports apparel giant looks to reshape design-for-recycling.  
By **Paul Dempsey**

# The Teardown

Nike ISPA Link trainers

The Link Axis is disassembled by hand and uses a greater amount of recycled material



The Link (left) and disassembled into laces, outsole and upper (right)



Nike's Flyknit technology uppers are generated directly from a thread rather than being cut from cloth, to reduce waste

NIKE/CHANNEL 4/DREAMTIME/FIRECREST FILMS



About 90 per cent of shoes still end up in landfill

FASHION IS OFTEN charged alongside technology as one of the main culprits when it comes to burgeoning landfill and stuttering progress on recycling. Within fashion, trainers are seen as a particular problem. How that market's big brands are looking to address growing criticism may contain interesting pointers for other markets.

According to a recent edition of Channel 4's 'Dispatches', the average Briton owns seven pairs of trainers, and of the 300 million shoes bought overall in the UK every year, about 90 per cent end up in landfill. Globally, 24 billion shoes are sold annually and trainers make up roughly a quarter. In environmental terms, all this translates into 1.4 per cent of carbon emissions, making footwear the world's 17th biggest polluter by some estimates, ahead of aviation and even developed countries like Italy.

The programme, subtitled 'The Truth About Adidas and Nike', made several dispiriting observations about what the big sneaker companies are doing to lower their products' environmental impact compared with their marketing. It uncovered more than a hint of greenwashing in terms of the claims being made for the recycled materials they already re-use.

But as it went out, Nike also announced a strategy that could become a template for future and more effective circular design. It seeks to combine modularity, material selection and re-use.

The company has unveiled two trainers under the ISPA Link brand. ISPA stands for 'improvise, scavenge, protect and adapt', the four objectives of a multidisciplinary engineering-to-design group tasked with delivering on the 10 principles in the company's Circular Design Guide (see box). The main initial focus for Link is 'disassembly'.

The first Link trainer puts modularity first, but also drops a big hint for technology. It uses no glue, unlike most modern footwear.

Instead, it can be picked apart in three by hand. The upper is attached to a series of plugs

Channel 4's 'Dispatches' found that Adidas 'Ocean Plastic' was actually recycled from bottles that had not left land



around the outsole. These have been positioned and engineered, Nike says, to still provide a close and comfortable athletic fit. Rather than shredding the entire shoe for recycling and then separating different materials so they can be appropriately processed, it is disassembled into more coherent units.

Apart from making recycling easier, this approach could also help to address our personal sneaker mountains by allowing owners to replace soles or uppers much as they would the strap on a smartwatch (though, strangely enough, Nike does not mention this in its initial marketing).

The first Link has just gone on sale, but the Link Axis will go a step further when it is launched early next year.

The same plug-and-play technique is used for the outsole and upper, but Link Axis makes greater use of already recycled materials. The upper will be made of 100 per cent recycled polyester and the sole tooling will be 100 per cent recycled thermoplastic polyurethane (TPU).

However, the cage – part of the sneaker that houses lacing and is used to improve torsion – will have only 20 per cent recycled TPU. For that component, Nike says that recycling can alter the material so that some new TPU needs to be part of the mix.

This is progress, but it highlights a wider problem with many current plastics. On one hand, companies are generally trying to re-use or replace them because they can persist in landfill for many years (ethylene

vinyl acetate, for example, is used for many trainer insoles but can take a thousand years to decompose). On the other, each round of recycling typically degrades material quality to the point that after a third or fourth pass, re-use options become very limited (basketball courts and arena bedding for riding schools, for example).

Nike has nevertheless been able to scavenge TPU for the Link Axis from the sole airbags in shoes already returned under its existing Nike Grind recycling scheme. It also uses its Flyknit technology on the sneakers. This directly assembles the shape of an upper from the thread, rather than it being cut and sewn from cloth, and thus reduces the amount of material needed.

Both Link trainers are to be launched at premium prices above £200, but Nike says its goal is to expand the same approach across more of its range.

"For mould-breaking models

like the Link and Link Axis to have full impact, the innovation must be scaled. That action is under way," the company says. "A holistic look at Nike product lines and supply chains is already determining where new approaches can be implemented to reach a wider audience."

This kind of philosophy is not new. But in technology, it is currently evolving primarily for design around the right-to-repair and extensions to hardware lifespans (even though Apple and others have recycling schemes).

Meanwhile for footwear, several niche brands are already addressing recycling around not just disassembly but also materials, including novel plastics that degrade more easily.

Nike, though, has the world's most valuable clothing brand, so when it makes a big push like this to promote and ease recycling in a controversial sector, it will be noticed, probably more than previous attempts that have arguably put marketing before delivery. The Link range is likely to set higher benchmarks for the company's efforts among campaigners and raise consumer expectations in both its markets and more widely.

Although this is not an end-state, particularly for materials science.

However, one further downbeat observation needs to be made when it comes to the UK specifically. The Link range is expected to go on sale here, but Nike itself cannot yet recycle it or any of its other products. Nike Grind is not currently available because the company says post-Brexit trade restrictions prevent it economically sending old trainers to its recycling facilities within the EU.

Perhaps though, the company could develop a solution by working with a local specialist. UK pioneers include the Traid apparel recycling network and Loughborough University's Centre for Sustainable Manufacturing and Recycling Technologies.

Or maybe Jacob Rees-Mogg could add trainers to his to-do list alongside vacuum cleaners. After all, landfill weighs the same whether you measure it in pounds or kilograms. ■

### PHILOSOPHY

## 10 PRINCIPLES OF NIKE'S CIRCULAR DESIGN GUIDE

- Material choices
- Cyclability
- Waste avoidance
- Disassembly
- Green chemistry
- Refurbishment
- Versatility
- Durability
- Circular packaging
- New Models

SOURCE: CIRCULARITY – GUIDING THE FUTURE OF DESIGN

Interconnected problems in an increasingly complex world require solutions based on the fusion of technology, science and the arts, says **Julio Ottino**.

# Book Interview

by Nick Smith



## Complex thinking for a world of complexity

ON THE COVER, above the title 'The Nexus', there is a two-line slogan that reads: 'Augmented thinking for a complex world.' Below, there is a sub-title of similar length, positioning the book as an invitation into the arena of "the new convergence of art, technology, and science". 'The Nexus' looks and feels more like a manifesto than a straightforward analysis of the locus where everything in the modern world meets. And that's part of the point, for 'The Nexus' is more than a book: it's a literary artefact that brings together art and design, photography and typesetting, philosophy and history. To be fair, its author Julio Ottino and his visual collaborator Bruce Mau have warned us: "today's complex problems demand a radically new way of thinking."

There is no single elevator pitch for 'The Nexus', says

Ottino. This will come as no surprise to anyone who has spent even a few minutes with it. While there are superficial resemblances to a conventional publication about complexity – structure, linear narrative, case studies – it is also a multi-dimensional experience. Vast, intricate visual renderings of complex ideas, wide-ranging photography and parallel text typesetting all combine to create an experience for the reader that is defined by being able to move around in different directions. Although it has a start, middle and end, there's no need to follow that order, and in some ways it's better if you don't.

Ottino says: "The arts and technologies are the largest domains of accumulated activity in humanity. But there are lots of misconceptions about how they work when you look at one domain from another. We go

through life and receive an education that provides us with a pair of glasses that allow us to see the world. An anthropologist has a different pair of glasses to an economist, and that will be different to how a physicist sees the world."

But, he continues, if you have the right combination of curiosity and inclination, "you can work to acquire a second pair of glasses. What would happen then?" It's not as simple as an engineer thinking like an artist, he says, "but it helps if we try to understand how other domains think". The reason for this is that "we equate outcomes with domains. But we don't look into the thought processes responsible for those outcomes."

What this means is that there is a kind of intellectual culture war going on in which scientists assume that artists are driven by subjective concepts such as

inspiration, while conversely "people from the artistic domain think of science as something which is just rational and logical: they don't understand the passions that move people in those domains".

What's interesting about technology, says Ottino, "is that it sits between these two domains". In science, we build our arguments on the work of those that have gone before us, "standing on the shoulders of giants". Meanwhile in art – especially modern art – "it isn't a good idea to stand too close to anybody". But with technology, "the only reason to stand on the shoulders of a giant is to crush it. Technology replaces previous technologies not because the earlier argument has run its course" – here Ottino explains that we continue to design new chairs even though their fundamental blueprint has

‘Technologies replace other technologies because you want a new outcome’

**Julio Ottino**



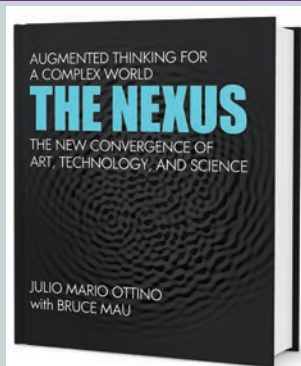
A ‘nexus thinking’ approach to tackling issues like ocean pollution addresses the context that created the problem in the first place

remained unchanged for centuries – but because innovation has led you to want a new prevailing outcome (“we must come up with more chairs all the time”). With technology existing somewhere between art and science, “the argument of my book is this: if you could understand this relationship you would end up with a broader mindset from which to produce ideas”.

The problem with the post-digital world is that global challenges are coming at us thick and fast, and the only way we can solve them at the rate they need to be addressed is to combine the best current thinking from all domains. This is the second of Ottino’s elevator pitches for ‘The Nexus’. In fact, this is the nexus, the point where domains cease to compete from entrenched silos and start to join up in ‘augmented complementarity’.

## WE READ IT FOR YOU ‘THE NEXUS’

If we are to find creative solutions to current and future global challenges – pandemics, climate change, food insecurity – we must apply lessons from the convergence of art, technology and science. It’s no longer enough to comfortably sit in one space while constructing barriers around it. We need to look at what happens where these three domains meet and to get stuck into some joined-up thinking, says author and academic thought leader Julio Ottino in ‘The Nexus’. In his provocative book, Ottino maps out what he calls ‘augmented thinking for a complex world’. To do this, he has enlisted the collaborative talents of legendary designer Bruce Mau, whose contribution is a masterclass in ‘Nexus thinking’ – making sense of the complexity – that the book advocates. No less than a manifesto for the future, ‘The Nexus’ is a powerful tool for leaders who want to think differently.



To illustrate this, Ottino tells a lengthy anecdote about when he was a consultant for Unilever, who defined his role as an *agent provocateur*. “They gave me access to everything they were doing in science and technology, visibility of the management structure, and they wanted me to question what they did.” One of the outcomes was that he advised Unilever to hold a symposium on complexity. The meeting was held in London at Tate Modern in a conference room overlooking the Millennium Bridge. “At that moment, I could say that the meeting represented the confluence of art, technology and science.”

Ottino, who is a Guggenheim fellow and a founding co-director of Northwestern University’s Institute on Complex Systems in the US, says that he has been thinking about the relationship between these three areas for most of his life. A polymath, he’s been an artist, an educator and a scientist working on chaos theory. He was also selected by the American Institute of Chemical Engineers as one of the One Hundred Engineers of the Modern Era. “For me, these domains were never really separate. They were always connected.” But it wasn’t until he met Bruce Mau that he was able to express nexus thinking in a concrete form. “We wanted the

way the book was constructed to portray the essence of the ideas within it.”

It’s almost inevitable that ‘The Nexus’ will be received by some critics as fancy academic thinking that can’t have any practical applications for solving real-world global problems. In other words, sceptics will say that it has all the hallmarks of an extended thought experiment where an educator and an artist have come together to ask a massively ambitious version of the question “what if?”.

I put to Ottino that there are massive international economic shocks threatening our energy future. There are worldwide public health crises. There are wars, climate emergencies, ocean pollution, poverty and so on. What has thinking differently – using ‘Nexus thinking’ – got to do with any of this? “When you look at a problem with one lens you tend to clean up that specific problem, but you eliminate the context that made the problem hard in the first place. Nexus thinking isn’t about bringing together people with different skills. It’s about understanding how they think. Then you need enough people to provide the connective tissue. And that’s how to confront big problems.” ■  
**‘The Nexus’ by Julio Ottino and Bruce Mau, is from the MIT Press, £36 (hardback)**

## EXTRACT JOINED-UP THINKING

Nexus thinking is an important part of the spectrum of world-leading organisations, one extreme being unstructured Nexus-based art practices morphing into structured enterprises. Nexus thinking manifests itself in two ways. Surface-level Nexus thinking is apparent when technology/science visibly blend with arts, or when hard-core engineering emerges in products infused with raw emotion.

But Nexus thinking is also present when analytical thinking and creative thinking coexist synergistically; when deductive and inductive thinking operate side-by-side to complement each other. This is embedded-level Nexus thinking. It is not visible in products *per se*, but apparent in how the organisation thinks and works.

Under Steve Jobs, Apple boldly declared that its products are “designed in California”, thus moving this integration to the forefront via inspired design and, in the process, creating the most valuable company in human history. Others also occupy this space, many preceding Apple, and new ones have emerged. Tesla and SpaceX are notable examples; both represent swerves, discontinuities on multiple fronts with the past. Pure engineering drives the SpaceX rocket’s designs, but engineering and human-centred design blend seamlessly in Dragon’s revolutionary spacecraft designs.

Teaming up with artists may be signifiers of the expanded thinking characterising some of these organisations. Planet.com, which presents itself as “an AI organisation that has deployed the largest constellation of Earth-observing satellites in history”, has had artwork laser-etched into the side panels of the more than 150 satellites it has launched; technological considerations did not drive this decision.

**Edited extract from ‘The Nexus’ by Julio Ottino and Bruce Mau, with permission.**