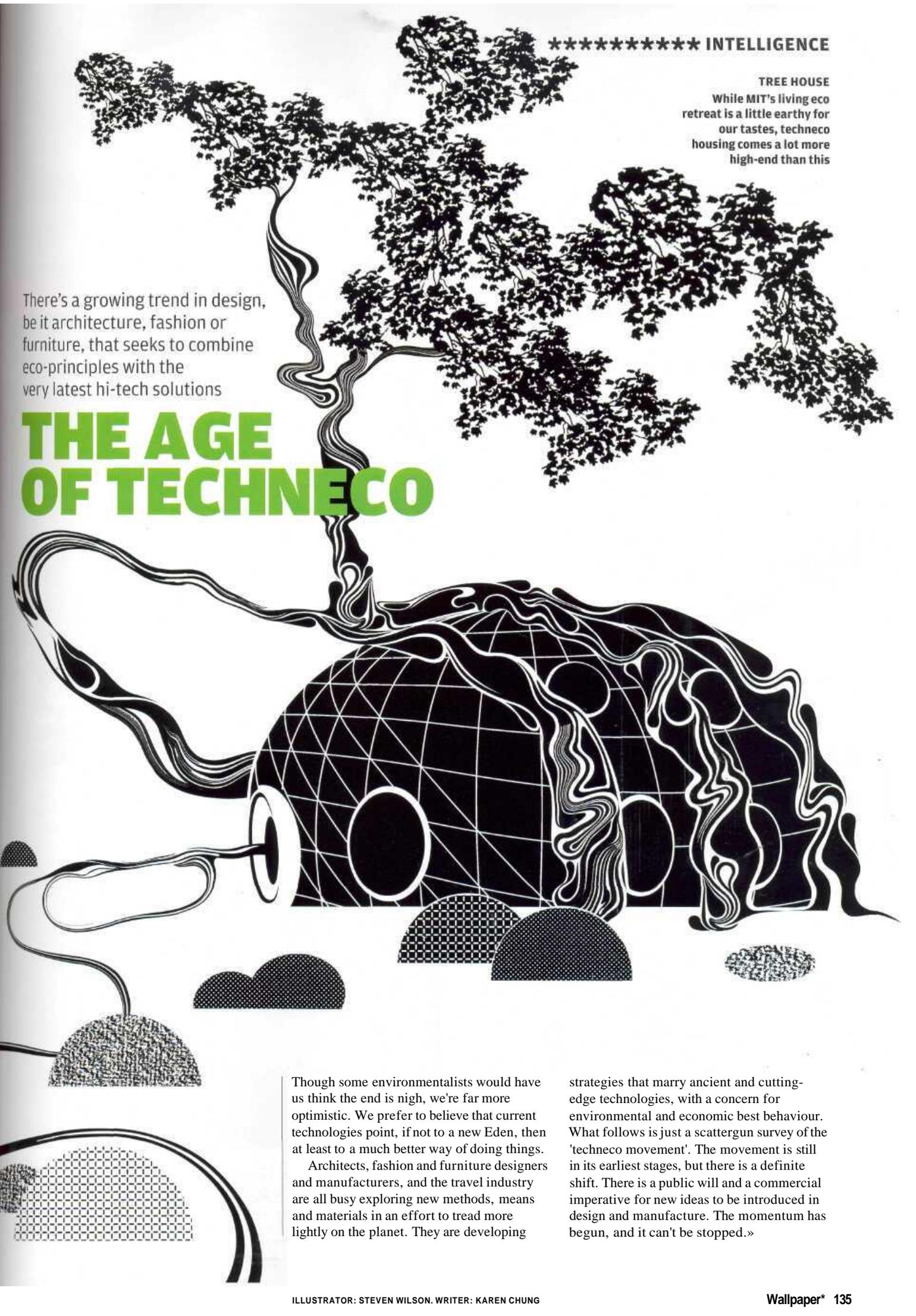


TREE HOUSE

While MIT's living eco retreat is a little earthy for our tastes, techneco housing comes a lot more high-end than this

There's a growing trend in design, be it architecture, fashion or furniture, that seeks to combine eco-principles with the very latest hi-tech solutions

# THE AGE OF TECHNECO



Though some environmentalists would have us think the end is nigh, we're far more optimistic. We prefer to believe that current technologies point, if not to a new Eden, then at least to a much better way of doing things.

Architects, fashion and furniture designers and manufacturers, and the travel industry are all busy exploring new methods, means and materials in an effort to tread more lightly on the planet. They are developing

strategies that marry ancient and cutting-edge technologies, with a concern for environmental and economic best behaviour. What follows is just a scattergun survey of the 'techneco movement'. The movement is still in its earliest stages, but there is a definite shift. There is a public will and a commercial imperative for new ideas to be introduced in design and manufacture. The momentum has begun, and it can't be stopped.»

Buildings account for around half our energy use, and generate vast quantities of air and water pollution. As their environmental impact becomes more apparent, the creation of healthier and more resource-efficient models of construction, renovation and operation is becoming increasingly important.

According to Sim Van der Ryn, a pioneer of sustainable architecture: 'The environmental crisis is a design crisis. It is a consequence of how things are made, how buildings are constructed and landscapes are used. Our present forms of agriculture, architecture, engineering and industry are derived from design epistemologies incompatible with nature's own.'

Christoph Behling and Solarlab, whose sleek solar-powered Solarshuttle is currently wowing the punters on the Serpentine in London's Hyde Park, firmly believes that 'change must be inspired, not forced'. Designers need to find their own way to

## Buildings account for half the energy we use. The environmental crisis is a design crisis

creative solutions. And what is nature if not the ultimate inspiration?

The science of biomimicry looks to nature to solve problems. In the same way that a solar cell was inspired by and works like a leaf, or Velcro is a homage to those pesky weed barbs that stick to your clothes, biomimicry uses an ecological standard to judge the 'lightness' of our technologies and innovations. It encourages us to learn from nature, rather than take from it.

The Eastgate Building, in Harare, Zimbabwe's largest commercial and shopping complex, is a fabulous example of sustainable architecture that uses dramatically less energy by copying the clever strategies of natural systems. It employs the same heating and cooling principles as local termite mounds. The termites build huge mounds to farm a fungus for food. But the fungi only thrive at exactly 30.5°C, while the outside temperature fluctuates between 2°C at night and 40°C during the day. The clever termites achieve a micro-farming miracle by opening and closing vents in the mound to maintain a constant temperature.

We humans, on the other hand, are far less efficient and have become accustomed to frittering away 60-70 per cent of our energy simply by transporting it hundreds of miles from centralised power stations. The solution is microgeneration: a model of efficiency, it means power production on the tiniest scale. Unlike energy supplied by remote power stations, microgenerated energy is created near to where the power is used, cutting bills, as transport costs are reduced, and releasing minimal to no carbon dioxide in the process.



**MITEY FINE**  
**Above, Harare's Eastgate Building uses the heating and cooling principles of a termite mound**  
**Below, Henrik Tjaerby's chairs for Artek, in bamboo, a favoured material for techneco designers**



Microgeneration includes everything from photovoltaic (PV) panels and wind turbines to hydrogen fuel and energy cells.

A long way from Harare in Altrincham, in northern England, is the Budenberg HAUS Projekte. Developed by Urban Splash and designed by Foster & Partners, it is one of the first residential developments to use Combined Heat and Power (CHP), generating heat and power on site, from the same process, rather than drawing electricity from the national grid. In this way, its efficiency is increased from 15 to 85 per cent. 'The project is one of a kind in the area, perhaps even in the UK,' says Nick Johnson, Urban Splash's director of development. 'It is pushing the architectural possibilities for home design and addressing green issues such as lower carbon emissions and recycling.'

One housing project pushing possibilities to the extreme is the living, growing eco>>>

FERRY TALE

Solarlab's Solarshuttle, powered by the sun, ferries people across the Serpentine in London's Hyde Park



retreat designed by Massachusetts Institute of Technology. The dwelling, formed by weaving the branches of a tree into archways, lattices and screens and allowing several decades for it to grow into a sheltered mesh, isn't likely to hit estate agents' windows anytime soon.

More practical, and already in action, however, is a house-cum-eco inn in Dominica that uses lots of new technologies. Called Alwen's Promise, it was constructed by the Boston-based Independence Energy Homes (IEH) and designed to serve as a beacon of what can be achieved by working intelligently and sensitively with local resources. And it could be reproduced by IEH at low cost.

All the energy for the house comes from the sun, using PV panels to transform light into electricity and solar thermal collectors to produce hot water. Building materials include timber made from rapidly renewable sources such as bamboo, used in the interior as well as in living fences in the landscape. The house will be self-sufficient, with energy stored in batteries, allowing its occupants every mod con without the bore and expense of being connected to a utility grid - so last century.

Dominica is known for the fertility of its soil, and, at the house, fruit and vegetable production is integrated into the design of the landscape: the master suite features a private

## A hi-tech pavement can cut air pollution by 60 to 70 per cent, say its makers

patio, screened by walls of bamboo on one side and mango trees on the other, so you can almost pick your breakfast from your bed. To keep pollution to a minimum, IEH will use low to no VOC (volatile organic compounds) products where possible. Proper ventilation, designed using fluid-modelling software, will inhibit mould in the humid climate.

Eco-resorts in pristine landscapes are one thing, but most energy is used and pollution spat out in cities. At the street level, a hi-tech pavement designed to cut pollution is being trialled in London. It is made of what look like normal grey paving slabs, but these new kids on the block contain titanium dioxide, which helps to break down nitrogen dioxide fumes from traffic. The Italian makers, Global Engineering, claim the pavements can cut air pollution by 60-70 per cent.

When green building becomes the norm, the architectural competitions that are

created to promote energy-efficient design and construction will become obsolete. However, we're a long way off from that and, until then, events such as New York's Green Building Competition continue to inspire and engage. The competition shows what can be achieved in a thickly populated urban sprawl, with all its attendant challenges, but as its organisers specify: 'sustainable development is non-negotiable'.

This year's Grand Winner, New Sunrise Yard, will be an operations hub for the NYC Department of Transportation. Covering 46,300 sq ft in Queens, it requires 65 per cent less energy than comparable buildings. These savings are achieved through green building techniques, including high-performance glass, efficient lighting, radiant floor heating, and demand-based ventilation. In addition, demolition waste will be reused and water run-off will be captured for the gardens.

On a similar note, in San Francisco's financial district, The Orchard Garden Hotel is one of the first American hotels, and the first in California, to get a nod from the Green Building Council. The hotel is full of natural light, all the wood is certified, and recyclable materials were used throughout construction. This is one hotel where body and conscience can rest easy at night.»



**FASHION AND FURNITURE**

Architecture may be ahead of the game, but there's also a push towards ecological responsibility in the worlds of furniture and fashion design. Environmentally friendly fashion has shaken off its worthy-but-dull image, as design has become a priority, not an afterthought. Moreover, the idea is now being championed by major retailers and manufacturers.

With 25 per cent of all global pesticides and fertilisers used in cotton production, old-fashioned cotton producers are high on the list of environmental baddies. Fairtrade cotton is the latest thing in the eco-fashion world. It works on the simple principle that the better the price paid to the grower for their cotton, the less pressure there is on them to use chemicals and pesticides to increase productivity. Topshop, a UK chain that has become synonymous with fast fashion for pocket change, began a trial of Fairtrade ranges this summer; they proved so successful the trial was extended and more space given over to the lines. In France, La Redoute and the Boulevard Haussmann flagship branch of Galeries Lafayette have also introduced Fairtrade cotton lines.

In the US, the cult label American Apparel has an organic clothing line, Sustainable

**POWERHOUSE**

**Above, these flats in east London, by Bill Dunster Architects, are designed to generate as much energy from renewable sources as they consume over a year**

**Below, the flats use solar energy and, to limit heat loss at night, the floors are made from concrete slabs that add thermal mass**



Edition. It also produces all its clothes in LA, promising no sweat-shop conditions during manufacture. Nike, Gap and Timberland, too, have all introduced products that in some way promise a lower environmental impact.

At the designer end, Katharine Hamnett is launching a new ethical clothing line next spring, and Tom Dixon has reworked the classic polo top in organic cotton for Lacoste. Edun, a new line by Ali Hewson, wife of U2 front man Bono, with American designer Rogan Gregory, aims to appeal to the urban fashion crowd not through guilt, but gratification. The range is about 20 per cent organic and is produced entirely in small, family-run factories in Africa and South America. Launched last year, it is already being stocked at Barneys and Saks Fifth Avenue in New York and Selfridges and Harvey Nichols in London.

As for furniture design, while it's not rare for designers to have an environmental agenda - from David Colwell, who worked on the Scottish Parliament building, and who has been flying the flag for sustainable design for 30 years, to Piet Hein Eek, whose use of reclaimed wood feels fresh and exciting - it is only now that mainstream manufacturers are finally picking up on the appeal of environmentally sensitive design. Knoll and Herman Miller are producing furniture that is almost entirely recyclable. Vitra makes Jasper Morrison stools from sustainably harvested and recyclable cork. And Artek has just produced a range of bamboo furniture designed by Henrik Tjaerby. Even mass-market giants Target and Wal-Mart are considering environment friendly lines.

Wood is very much back on designers' agendas, encasing everything from laptops to TVs. Swedex has been manufacturing LCD monitors embedded in wood since 2000, in a bid to bring warmth and personality into our everyday interactions with technology.

Similarly, industrial designer Takumi Shimamura has created his Monacca range of cedar bags and briefcases with just this in mind. Cedar has been used in construction in Japan since the 1940s, and good quality timber is dependent on forests being thinned responsibly and regularly. Shimamura not only makes use of the supply of wood the thinning-out creates, but contributes to future growth by putting a small percentage of profits back into the forest.

'Between 80 and 90 per cent of the environmental impact of a product is locked into an object while in the idea stages of the design,' says the Mexican designer Emiliano Godoy. 'A good designer should be able to produce furniture that is better, cheaper and beautiful, while also being environmentally appropriate.' Change is inevitable, if only because it's hard to imagine many young architects or designers now entering their chosen fields not thinking in similar ways. How much change we'll see, though, depends on how much manufacturers are willing to bet on such thinking - and how much we are prepared to demand it and pay for it. ✪