

Materialise Forum at the Royal College of Art

27 September 2005

Report by Hugh Aldersey-Williams

One of the things that characterises a good designer is an interest in – no, make that a lust for – new materials. But they seldom get the chance to meet the people who really know about these novelties, the materials scientists. Which is why the Materialise conference, run by the Royal College of Art on 29 September 2005 as part of the InnovationRCA programme, held such promise.

The conference brought together 100 or so materials scientists from industry and academia as well as designers in disciplines from automotive design to fashion. Clare Johnston, Professor of Textiles at the RCA, singled out some findings from a pre-conference survey of the delegates. Just over half felt the UK had a poor record in supplying new materials, but only 17 per cent thought there was no role for designers in materials development. Most felt that even if designers weren't technical experts, 'they ask interesting questions'. Everybody agreed that a poor choice of materials had compromised a past design. And what motivates people to use new materials? Better performance, new function, but also playfulness and the 'sheer indulgent thrill of newness'.

Bernie Rickinson, Chief Executive of the Institute of Materials, Minerals & Mining and joint conference chair with Clare Johnston, outlined the potential of the day. Noting the advertisements

along the subway of South Kensington station, he showed how much of the consumer appeal of products such as mobile phones is connected with the materials they use. There is free competition in the materials industry, but a communications problem, Rickinson said. Few corporations support their own laboratories so they are increasingly looking to academia for scientific developments in materials. And they need to look to the design community for creative developments too, especially now that the emphasis of the UK's Foresight programme is shifting from the purely technological to quality-of-life issues in innovation.

Practitioners in contrasting fields then offered their personal experience of working with materials. Material scientist David Bott, technology consultant to the Department of Trade and Industry explored how the choice of materials makes a product good or bad and how even very ordinary items can have complex stories in material development. He contrasted the cult Apple iPod with the same company's Powerbook laptop. The latter was poor because design triumphed over function; its aluminium casing, which looks so alluring when new, can become dented making the whole product less desirable. The iPod, on the other hand, makes use of a sophisticated mix of materials, yet in a way that yields a timeless icon with a strange retro feel



Clare Johnston, Head of Textiles,
Royal College of Art



Bernie Rickinson, Chief Executive,
Institute of Materials, Minerals & Mining



David Bott, consultant to Department
of Trade and Industry

about it. But it was the far humbler toothpaste tube that presented a more significant functional challenge for materials technology, needing to be waterproof, hygienic, flexible, cheap to manufacture and much else besides. Few attendees would have expected to spend quarter of an hour enthralled to hear about its detailed evolution.

Caroline Broadhead gave the artist's story. Her insights into what she looked for in materials, together with her jewellery and textile designs, took the more literal-minded by surprise. 'I'm interested in materials without a history, without a past,' she explained, showing images of her best-known work, jewellery in which nylon fibres brush sensually against the wrist or waist, using their springiness to hold the band in place. 'Jewellery is not material-specific. The feel against the skin is important. The choice of materials is integral to the idea.' Thus, in a project called Seven Ages, white fabrics of all kinds were used to create a series of seven varied conceptual garments. An interest in the dynamics of fabrics – they way they drape and flow or whether they rustle or swish – might be investigated scientifically, but for Broadhead the natural way to explore these qualities was to work with a choreographer, using dancers wearing skirts of different materials for different effects.

The very different world of the industrialist was described by David Godber of Nissan Design Europe. The company's new design centre is located in the middle of London, in order to appeal to the right kind of staff and keep a finger on the style pulse. It is home to a cross-functional team whose every need is catered for, even to the extent of having full fabrication facilities on-site. One design concept shown by Nissan

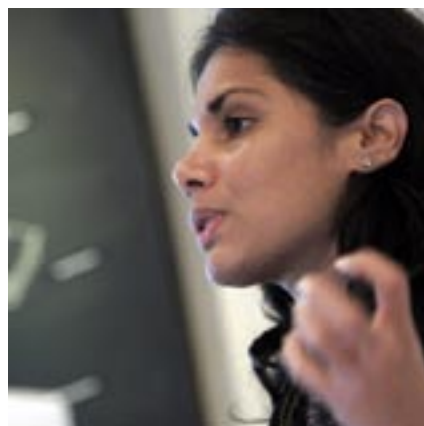
at this year's Geneva Motor Show used 7,000 components and 1100 different materials. Many such designs are tried out to test the market's readiness for new ideas. For example, car indicator lights need not appear in their characteristic orange colour until actually illuminated, thanks to developments in materials, but will drivers accept this visual alteration? Car manufacture is a global business, but not all designs are for all markets, and – perhaps more surprisingly – Nissan seeks out designers from diverse countries partly in order to access particular strengths in materials there.

Nipa Doshi of Doshi Levien told the designer's tale. After graduating from the RCA, she worked in India. One client was the kitchenware maker Tefal which was ignoring local materials and practices in trying to sell its products. As Doshi said, 'you don't use a frying pan to make chapattis'. There was a cultural mismatch as well as a functional one. The Tefal products seemed cheap simply because of the materials they used, something that 'negates the culture of food'. Doshi tackled these problems by asking the sort of questions designers ask but materials scientists might not. Why, for example, is Teflon always black? Her design manager at Tefal didn't know so the question was passed on through the company until it reached the appropriate materials expert (the designer was not allowed to ask directly). There was no reason. This was Doshi Levien's cue to devise cookware with colourful patterns in the Teflon, combining Western innovation with local tradition.

Over lunch, the product designer Richard Seymour warned that we forget more than we remember. 'The future is back there,' he said. To prove his point he described collodion, a



David Godber, Nissan



Nia Doshi, Doshi Levien



Caroline Broadhead, artist



Discussion leaders (left to right): Alan Ponsford, Capoco Design; Eoin Billings, Grimshaw Industrial Design; Richard Eisermann, Design Council

mid-19th century innovation for dressing wounds. This colloidal jelly of organic chemicals, though effective, is neglected today. Other innovations are imagined in fiction before they can be realised. The technology may exist with no application or the other way round. In either case, designers and technologists – both groups, as Seymour put it, ‘card-carrying optimists’ – can bridge the gap by working together.

To ensure that the dialogue between science and design became more than just wishful thinking, the conference split into discussion groups for the afternoon session. These focused on fields where it was thought that innovative use of materials might be especially beneficial: building, crime prevention, energy, fashion, healthcare, and transport. Many specific ideas emerged from the dialogue (some of them appear at the end of this report). Some of the apparently bizarre brainwaves of the designers astonished some from the materials community. The materials scientists were able to amaze the designers in their turn with news of what some materials could do.

Significant tangential considerations also surfaced from these discussions. A major worry shared by both designers and materials experts was the preparedness of various industries to embrace the risk associated with pioneering a new materials application. For some, consumers were another brake. Although the marketplace is the driver for innovation, consumers’ preconceptions as to what materials are acceptable for certain applications may change only slowly over time (it might be a struggle to reintroduce collo-

dion or for that matter seaweed-based dressings in a market dominated by synthetic, readymade bandages, for example). But some designers felt it was possible to ‘seed the need’ for particular innovations by means of prototypes and demonstration projects.

Despite the thrust of science, high-tech was not automatically judged the way to go. Sometimes natural materials and methods were preferred to the synthetic. Occasionally, old materials might be found to hold the answers to new problems, such as sustainability and recyclability. Perception of the value of materials influences many of these issues. So what can be done to make plastics seem more valuable, to use materials that people perceive as increasing in worth, to create the heirlooms of tomorrow?

By this stage, it had become apparent that designers are generally not close enough to where the innovation happens to stimulate new thinking. In the exceptional circumstances when they are, then appealing uses for new materials are likely to be found that much sooner. But all too often, companies jealously guard their new materials as commercial secrets, and so do not find consumer applications for them simply because they have not been shown to the kind of people who could come up with the ideas.

Invited to offer his critique of the day, writer Hugh Aldersey-Williams noted the incipient fusion that might be possible between designers and materials scientists – unlike many science and arts communities, these two already speak pretty much the same language, the language



Discussion leaders (left to right): Sue Chorley, designer and consultant; Mike Pearson, Pearson Matthews; Peter Buckle, University of Surrey



Left to right: Richard Seymour, Seymour Powell; writer Hugh Aldersey-Williams; Michael Farmer, Audi Design Foundation

of physical stuff. He amplified discussion of the intrinsic relation between materials and worth, making a plea that both groups should seek to develop and use materials that wear attractively, to promote product longevity rather than a throwaway culture. Despite token mentions, it seemed that environmental considerations were not truly ingrained in the thinking either of materials scientists (whose focus is on sourcing, refining and using virgin material) or designers (whose urge is to create new things rather than reduce waste). These topics would have to rank higher in any future Materialise.

There was strong support for a such a future meeting. The consensus was that this should happen sooner rather than later, perhaps involving smaller groups, put together for a longer time and also involving hands-on sessions with new materials. There should be more young blood, perhaps with input from design students and the Institute of Materials' Young Materials Group. All this was indicative of a commitment to dialogue and creative cross disciplinary cooperation that was powerfully articulated at the conclusion of the event by Michael Farmer of the Audi Design Foundation, which co-sponsored Materialise with MaDE (Materials and Design Exchange) and InnovationRCA.

Hugh Aldersey-Williams is a writer and curator in design and science. He was co-curator of Touch Me: Design and Sensation at the Victoria and Albert Museum in 2005. In 2003, he curated Zoomorphic: New Animal Architecture, also at the V&A. He is the author of several books on design, architecture and popular science, most recently Findings: Hidden Stories in First-hand Accounts of Scientific Discovery.

Think bike!

A bicycle that squashes or deflates for storage and self-illuminates at night.

Hello boys (and girls)

A spray-on bra using nanotechnology to avoid discoloration and provide medical diagnostic information, also incorporating smart gels for a bustier look at the press of a button.

Hair-raising innovation

A jacket that adjusts for temperature, increasing or decreasing the amount of insulation as necessary, analogous to the way mammals raise the fur on their skin.

Put me down

Luggage that screams for help if stolen, using quantum tunnelling composites to produce an electrical signal if the material is deformed or ripped.

Big bags, short trip?

Try the suitcase that shrink wraps to fit the amount of clothes you are carrying.

Society for the Avoidance of Ancient Monuments

The building structure that 'dissolves back into nature' when it has outlived its usefulness.

Are you sitting comfortably?

The wheelchair that uses shape-memory materials for an exact fit