

Innovation for Added Value: Experimentation With Aluminium in the Fine Crafts and Design.

Suzette Worden

Curtin University of Technology

Aluminium is often described as a 'material of accents'. Although an essential component of everyday life, it has never overwhelmed the design landscape but has been associated with multiple attributes including preciousness, versatility, economy, strength and lightness.

In the 19th Century aluminium failed, unlike plastics, to pass itself off as a substitute material. When accepted on its own terms aluminium made its reputation based on its aesthetic neutrality. It is also popular for its lightness, malleability and ability to be recycled and ability to be transformed through printing and colouring. More recently aluminium has become part of aesthetic statements about technology in the work of Ron Arad and Marc Newson. Aluminium has been the subject of popular academic attention through the publication *Aluminium By Design*, edited by Sarah Nichols and published in 2000, which accompanied a Carnegie Museum of Art (Pittsburgh USA) travelling exhibition. This has brought fresh attention to the potential of this area for historical and critical investigation.

In this paper it will be argued that areas for further investigation include:

- A deeper understanding of the aesthetic properties of aluminium products in the context of its use both as a precious 'art' material and within the production of mass consumer goods.
- A critical understanding of materials innovation within design and craft in Australia.

This will be demonstrated through the discussion and contextualisation of a project that aims to explore the innovative use of aluminium in craft and product design. Form: Contemporary Craft and Design Inc, (the Western Australian-based craft and design organisation) is in partnership with Alcoa to explore the innovative use of aluminium in craft and product design through a series of projects over three years. The dynamics (communication and collaboration) between industry, arts organisations, education and the public within this project will be discussed to provide a regionally specific understanding of current debates and interpretations of design. In particular this discussion will consider issues highlighted by The Myer Report (Commonwealth Department of Communications, Information Technology and the Arts 2002. Report of the Contemporary Visual Arts and Crafts Inquiry) which describes the commercial contemporary visual arts and craft sector and its interaction with the wider economy as a network, or chain, of individuals, businesses and organizations, with craft practitioners at the supply end. This will include considering what kinds of conditions are most conducive for the promotion of materials innovation as part of a wider creative, cultural discourse and for economic growth.

The research investigates: (1) the channels of communication through which contributions to effective innovative solutions are disseminated (2) the nature of value-adding and impact value of the creative arts.

Innovation for added value: experimentation with aluminium in the fine crafts and design.

Aluminium has been described as a 'material of accents' (Nichols). Although it has become an essential component of everyday life, it has never overwhelmed the design landscape; instead aluminium has become associated with multiple attributes including preciousness, versatility, economy, strength and lightness. In the 20th century aluminium failed, unlike plastics, to pass itself off as a substitute material. When accepted on its own terms aluminium made its reputation based on its aesthetic neutrality and also became popular for its malleability, ability to be recycled and ability to be transformed through printing and colouring. Designers and manufactures have exploited these qualities in many innovative and socially useful ways. The catalogue *Aluminum by Design: Jewelry to Jets*, from an international exhibition curated by the Carnegie Museum of Art, has provided a starting point for considering this important material as the authors discuss the application of aluminium in the context of shifting social, political and economic contexts (Nichols).

This paper examines how aluminium is an essential part of Australian material culture. When investigating the development of design in Australia, aluminium is of particular interest because its production is such an important part of the Australian economy. In 2001, Australia produced 33% of the world's alumina and was the world's fifth largest producer of aluminium (AAC). This industry is one of the few industries in the Australian resources sector that is dominated by value-added exports (alumina, ingot, and semi-fabricated products) and the industry is a global player with nine out of the world's ten leading aluminium companies participating in the Australian industry (S. L. G. S. LMAA). 4% of Australian aluminium is used in consumer durables. This is not a large proportion of total production but it shows that the connection between production and consumption can be traced through the industry's supply chain, which is relevant for discussions of economics, sustainable design and eco-innovation (Picton and Daniels).

Aluminium is a material that Australian designers have used in products with strong aesthetic and formal qualities and these artefacts have contributed to their international reputations. For example, Marc Newson's aluminium Lockheed Lounge chair was launched in 1986 at the Roslyn Oxley Gallery in Sydney and received international exposure when Philippe Starck purchased it for the Paramount Hotel in New York (Meijer).

Design icons, such as the Lockheed Lounge chair, have strong visual messages but there is less information on the design process, which brings about such achievements, and still less information that documents the creative thought processes and their relationship to innovation. Design researchers also need more information on the design of anonymous aluminium objects that have also become culturally significant. For example, aluminium has always been associated with transport. It was symbolically associated with flight long before it became used in aircraft production. Diversification after the Second World War led to its promotion for the

manufacture of consumer goods, extending its possible usage in manufacture. It is still being 'reinvented' for innovative use in both familiar and new contexts. A recent example is the collaboration between Alcoa (USA) and Audi, with the Audi A2 launched in 1999 (Schatzberg). From the beginning of the 20th century the uses of aluminium for the domestic market were first appreciated for its functionality in cookware and then as fashionable household objects. For design research an important question to investigate is therefore: how does design innovation add value?

In this paper I will discuss the potential of aluminium in the context of innovation for added value, and more specifically about the role of design and its critical reception in Australia. The paper provides, as a case study, an account of a project initiated by Form: Contemporary Craft and Design Inc. (formerly Craftwest Centre for Contemporary Craft and Design until July 2004) in Western Australia. The project is currently giving designers an opportunity to explore and experiment with aluminium, with individual exploratory projects being followed by a design competition. Over three years the aim of the project is also to showcase the innovative potential of the design process through contextualising the outcomes of the exploration of aluminium in an exhibition format in 2005. This involves research through practice by the practitioners and documentation of the process for inclusion in the Designing Futures Knowledge Space, which is a dissemination and information space for innovation and design (Craftwest, Designing Futures: 2004 Program). Innovation is understood to include research and development, interchange with customers, and an understanding of the way innovation itself operates. The benefits of innovation can be incremental or radical. In association with innovation, creativity is the capacity to bridge intellectual chasms or merge seemingly unrelated pools of knowledge (Mascitelli).

I will then discuss the broader context, which forms the basis for proposing a theoretical approach to understanding the significance of materials research. This encompasses cultural interpretations of skill, materials and technology in relation to the cultural meaning of materiality.

Vast Terrain

Form, the West Australian based craft and design organisation is exploring the innovative use of aluminium in craft and product design through the project 'Vast Terrain: exploring Uncommon Ground'. Alcoa World Alumina Australia provides funding support for an exhibition program, with the aim of providing new educational and employment possibilities. Form has already run a project that has expanded the parameters of design for the West Australian timber industry. This was in response to the need for professional development of Western Australia's fine wood sector in the wake of the cessation of old-growth timber logging in 2001. This work was disseminated through a conference in August 2002 and the resulting publication *Shifting Foundations* (Craftwest, Shifting Foundations: The Collection of Papers of the Designing Futures Forum). The Designing Futures project has stimulated the design for wood and the formation of creative clusters Dwellingup and Denmark, Western Australia.

The interface between craft and design has a long history. Currently there is a shift in the alignment of Australian craft experimentation from the fine arts to design (Cochrane, "Shapes of Things to Come: Australia"). Historically the cultural relevance of craft for design has been through the transfer of knowledge about materials and technique from hand to machine (Frayling; Harrod; Cochrane, The Crafts Movement in Australia: A History).

Accounts of Australian designers' utilisation of aluminium in design and innovation are scant and fragmented or not fully acknowledged in international architectural and design history sources. A study of the 'Vast Terrain: exploring Uncommon Ground' project therefore complements existing international studies and provide important data for assessing Australian achievements. Craftspeople and designers who have gained international reputations in this area of work include: Helen Aitken-Kuhnen, Susan Cohn, Ian Ferguson, Johannes Kuhnen for jewellery and hollow-ware and Marc Newson for furniture (Hinchcliffe, "31@20: Gold and Silversmithing"; Hinchcliffe, "Multiple Idioms in Metal & Glass"; Morgan).

'Vast Terrain: exploring Uncommon Ground' will include the work of designers Andrew Last, Frank Bauer and Robert Foster. The Australian metal smith Andrew Last integrates his practice with teaching and has recently completed a commission of a light-sculpture for Federation Square, Melbourne. He works on small-scale intimate jewellery as well as on large-scale commissions. His experimental work with aluminium has included the welding of small components to create jewellery pieces and the introduction of miniaturised engineering principles to his work. He creates objects that although functional can be read as sculptural works. Frank Bauer works on individual pieces that are often produced as direct commissions for galleries and exhibitions. Bauer is now based in Adelaide but was trained in Germany and has also worked in London and Sydney. His latest works are evolving designs for wall lights that express an interest in movement and interaction. The works are based on a patented system of small low-voltage lamps as visual connectors through a structure of perforated anodised aluminium sheets. Robert Foster works with his wife, Gretal and has a commercial studio and production workshop near Canberra. Their company Fink retails throughout Australia and internationally. Individual commissions are produced alongside the production work (Fink & Co). Foster has gained an international reputation for his vessel forms. The most recent examples are dependent upon an innovative water-forming process for aluminium, which gives the vessels undulating and flowing surfaces.

What makes the Form project significant is the alignment to regional needs and cultural identity. But at the same time, the outcomes become part of a wider concern for the development of the creative industries and creative clusters. This is in the form of a multi-layered artistic program that enhances and commercialises the creativity of designers and craftspeople, and is targeted towards the sector's sustainable expansion (Craftwest, Designing Futures: 2004 Program).

Materials and the Creative Industries

The Myer Report (Commonwealth Department of Communications, Information Technology and the Arts 2002. Report of the Contemporary Visual Arts and Crafts Inquiry) described the commercial contemporary visual arts and craft sector and its interaction with the wider economy as a network, or chain, of individuals, businesses and organisations. Craft practitioners are at the supply end; and at the demand end of the chain are consumers, individuals, businesses and organisations that purchase or view the craft works. The Form project reported in this paper not only works as an intermediary but also considers the expectations of materials producers and manufacturers through working closely with Alcoa. This includes considering what kinds of conditions are most conducive for the promotion of materials innovation as part of a wider creative, cultural discourse and for economic growth. The project is a channel of communication through which contributions for effective innovative solutions are disseminated and demonstrated. This is a way of value adding and strengthening the impact of the creative arts. This is therefore a contribution to the ways in which the creative industries incorporate design production and design knowledge. Within Western Australia, a recent Western Australian State Government Premier's Task Force on the fashion industry (Snell) has stimulated interest in the creative arts.

Theories of innovation for design stem from the expectation that innovation is about adding value, creating new markets or improving design (Ardayfio; Von Stamm; Lloyd). It also has a central role within design studies and in this context innovation is often linked with creativity. This has different resonances, dependent on socially specific definitions, when creativity is seen as integral to successful wealth creation within a knowledge economy. 'Breakthrough' innovation that creates a temporary monopoly is regarded as the most effective kind of innovation and is thought to have a high dependence on tacit knowledge as found in the arts and crafts (Mascitelli). The potential for this kind of investigation has been noted but not widely put into practice. For example, the Australian Federal Government, Light Metals Action Agenda (LMAA) recommendations for the innovative application of light metals include identifying and targeting specific end users (e.g. architects/designers), developing strategies to engage them, including through their industry associations, educational/training institutions and/or the use of design or other awards (LMAA).

If this kind of project is carried through with an arts organization, a further dimension will be added. This is a discussion and demonstration of the ways in which the crafts have been associated with the arts as conveyors of symbolic and emotional values. This can then be incorporated into the LMAA agenda (Myerson). Such projects can provide case studies and data on studio workshop production, which is crucial for examining the communicative aspects of innovation. This area of research has the most potential for providing examples of new ways of working (Yair, Press and Tomes). Internationally, providing case study information has been a successful strategy of the UK Design Council in its promotion of British Design and has

formed the basis of high profile international exhibitions. For example: 'Great Expectations', shown Melbourne, Brisbane and Sydney in 2003-2004 (British Council). By providing case studies, documentation and assessment of the viability of adding value through the innovative use of aluminium in consumer products, the Form project can raise the profile of Australian design in manufacturing markets.

Materials Histories

Although materials are a critical consideration in the design of artefacts there are surprisingly few academic studies concentrating solely on materials histories. Research on the significance of materials for design is currently less developed than studies of consumption, mechanisation and the impact of the digital revolution (Doordan). Plastic has gained the most interest; otherwise interest in materials is invariably integrated with other considerations even though it is regarded as a determining factor in the history of modern design. Doordan has summarised the challenges facing the researcher of materials by suggesting that any framework for the study of materials should consider the triad 'fabrication', 'application' and 'appreciation'. The work of the designer in the feedback loops within that sequence should also be considered (Doordan). In addition this paper proposes that it is important to critically examine the nuances of the cultural meaning of materiality.

Modernism had a materialist ethic that was eventually demolished by new technologies. Those technologies such as plastics and automation, but particularly computerisation, have led to concern for virtuality and the ephemeral. But, as Moles suggests, these technologies cannot exist unless these immaterial products are linked to the mechanical infrastructure that generates, stabilises and governs them (Moles). There are other concepts that have become integral to these debates and have been successfully used to explain digital culture. This includes the concept of dematerialisation as a way of understanding materiality; workability of a material as a definition of its possibilities as a medium (McCollough); concepts of disassembly and recycling (Dormer). Postmodernism has challenged 'mind' and 'body' dualisms and from this questioning come ideas about hybridity and multidimensionality where there are no clear cut boundaries between people and things (Haraway; Burkitt). In this context it is relevant to extend the theoretical positions that propose that 'artefacts' can speak; and to examine the arguments where realists have expressed the notion that there is a material reality separate from human culture, with its own internal causal mechanisms and structures, and constructionists who want to overcome this dichotomy by concentrating on the discourses people use to try and understand the world and stories told to achieve such meanings (Burkitt; Holstein and Gubrium).

This paper proposes that these differing approaches to materiality within postmodern theory can be used to inform the analysis of the data collected through examining experimentation with aluminium in design. By addressing this topic from an interdisciplinary perspective it is possible to address the practical and theoretical significance of materiality.

References

- AAC, Australian Aluminium Council. Key Facts and Figures. 2001. Available: http://www.aluminium.org.au/Frame_Stats.html. 5 February 2004.
- Ardayfio, David D. "Principles and Practices of Design Innovation." Technological Forecasting and Social Change 64.2-3 (2000): 155-69.
- British Council, Australia. Great Expectations. Available: <http://www1.britishcouncil.org/au-arts-visual-design-we-have-great-expectations.htm>. 1 Feb 2004.
- Burkitt, Ian. "Bodies of Knowledge: Beyond Cartesian Views of Persons, Selves and Mind." Journal for the Theory of Social Behaviour 28.1 (1998): 63-82.
- Cochrane, Grace. The Crafts Movement in Australia: A History. Kensington NSW: New South Wales University Press, 1992.
- . "Shapes of Things to Come: Australia." Crafts.181 (2003): 14.
- Craftwest. Designing Futures: 2004 Program. 2004. Available: http://www.designingfutures.com.au/DF/Current/01_project. 15 January 2004.
- . Shifting Foundations: The Collection of Papers of the Designing Futures Forum. Perth: Craftwest, 2003.
- Doordan, Dennis P. "On Materials." Design Issues 19.4 (2003): 3-8.
- Dormer, Peter. Design since 1945. London: Thames & Hudson, 1993.
- Fink & Co. 2004. Available: <http://www.finkdesign.com/index.htm>. 15 may 2004.
- Frayling, Chris (ed). Beyond the Dovetail: Craft, Skill and Imagination. London: Crafts Council, 1991.
- Haraway, Donna. Simians, Cyborgs and Women: The Reinvention of Nature. Routledge, 1991.
- Harrod, Tanya. The Crafts in Britain in the Twentieth Century. Yale University Press, 1999.
- Hinchcliffe, Meredith. "31@20: Gold and Silversmithing." Crafts Arts International.53 (2001): 85-86.
- . "Multiple Idioms in Metal & Glass." Crafts Arts International.54 (2002): 34-39.
- Holstein, James, and Jaber F Gubrium. The Self We Live by Narrative Identity in a Postmodernworld. Oxford University Press, 2000.
- Lloyd, Peter & Snelders, Dirk. What Was Philippe Starck Thinking Of? Ed. Peter & Christiaans Lloyd, Henri. Delft: Delft University Press, 2001.
- LMAA. Light Metals Action Agenda Working Paper No 4 Downstream Manufacturing (August 2001). 2001. Available: <http://www.industry.gov.au/assets/documents/itrinternet/lmDownstream110901.pdf>. Accessed 30 Jan 2004.
- LMAA, Strategic Leaders Group (SLG). Australia Leading the Light Metals Age Strategic Leaders Group Report to Government. 2001. Available: <http://www.industry.gov.au/assets/documents/itrinternet/lmaa.pdf>. Accessed 30 Jan 2004.

- Mascitelli, Ronald. "From Experience: Harnessing Tacit Knowledge to Achieve Breakthrough Innovation." Journal of Product Innovation Management 17.3 (2000): 179-93.
- McCullough, Malcolm. Abstracting Craft: The Practiced Digital Hand. Cambridge, Mass: MIT Press, 1996.
- Meijer, Herman. "Flashback." Frame. 16 (2000): 33.
- Moles, Abraham A. "Design and Immateriality: What of It in a Post Industrial Society?" The Idea of Design. Ed. Victor & Buchanan Margolin, Richard. Cambridge, Mass: MIT Press, 1995. 268-74.
- Morgan, Conway Lloyd. Marc Newson. London: Thames & Hudson, 2003.
- Myerson, J. "Things to Enjoy: Reassessing Craft and Design Objects in an Age of Technology." The Role of Product Design in Post-Industrial Society. Ed. Tevfik Balcioglu. Rochester, Kent & Ankara, Turkey: Kent Institute of Art and Design & Middle East Technical University, 1998. 59-76.
- Nichols, Sarah. Aluminum by Design. New York: Harry N Adams, 2000.
- Picton, T., and P. L. Daniels. "Ecological Restructuring for Sustainable Development: Evidence from the Australian Economy." Ecological Economics 29.3 (1999): 405-25.
- Schatzberg, Eric. "Symbolic Culture and Technological Change: The Cultural History of Aluminum as an Industrial Material." Enterprise & Society 4. June 2003 (2003): 226-71.
- Snell, Ted (Chair). The Premier's Fashion Industry Taskforce. Perth: Government of Western Australia, Office of the Premier, 2003.
- Von Stamm, Bettina. About Innovation. nd. Design Council. Available: http://www.designcouncil.org.uk/webdav/servlet/XRM?Page/@id=6043&Session/@id=D_GdgRbFS4nUug1wOlw9Dq&Section/@id=1534. 05 Feb 2004.
- Yair, Karen, Mike Press, and Anne Tomes. "Crafting Competitive Advantage: Crafts Knowledge as a Strategic Resource." Design Studies 22.4 (2001): 377-94.