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Patterns, Pleasure, and the Age of Digital Reproduction

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Patterns, Pleasure, and the Age of Digital Reproduction

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Abstract: Over the past decade a range of printed textiles designed by Indigenous artisans in remote regions of Northern Australia have gained national prominence; winning awards and achieving commercial success due to their mesmerizing effect. These patterns share a beauty with celebrated textile patterns from the past, such as Mamluk carpets. In this paper, literature regarding aesthetics, perception and brain activity is reviewed to identify the characteristics of patterns that create pleasure by stimulating positive nerve centres in the brain. This knowledge may assist designers who aim to create patterns of lasting value and high esteem in an age of digital design interface and digital reproduction.

Keywords: Pattern, Textile Design, Biophilia, Aesthetic, Pleasure, Beauty, Wonder

Living Patterns

Occasionally we see a pattern that is enthralling, breathtaking and unforgettable. This paper examines theories of aesthetics together with evidence from physical and physiological research to explain the mesmerizing effect of these patterns. These research findings might assist designers to create patterns of lasting value and high esteem in an age of digital design. This paper adopts the conceptual framework of biophilic pattern design and applies it to the field of textile design to explain the appeal of enthralling patterns. Research and insights from the neurosciences and endocrinology used to "capture the positive psychophysiological and cognitive benefits of biophilic design patterns in the built environment" (Ryan et al 2015, 62) are reviewed. The term, living pattern was coined by Ramzy to describe biophilic design principles in buildings that offer a "healthier alternative to what architects currently embrace" (2015, 43). The term living patterns is used in this paper to describe patterns that create feelings of awe.

Living patterns may elicit a cognitive journey and suggest, "a sense that the world is made up of patterns that connect" (Rose 2015, 301). This was the author's reaction when viewing the fabric pattern, Fog Dreaming, designed by Marita Sambono in 2012 (Figure 1). The design, Fog Dreaming, seemed to transport the author on a cognitive journey where, for an instance, it felt as if there was a connection with an imagined world order. The contemporary philosopher, John Armstrong, writes of the experiences of beauty as "a moment of revelation in which we suddenly—and for a short time—gain great insight into ourselves and the world" (1999, 136). Such impressions may be readily recognized, however, an explanation of their causes is complex.

The task of unraveling the attributes of memorable patterns is multifaceted and it is unlikely that any list of attributes will be true in all cases. However, the following list may be helpful in establishing the characteristics of some *living patterns*. This list of attributes will evolve from a review of literature about digital reproduction, in relation to maintaining the "aura" of affective patterns, followed by ideas regarding aesthetics. I will then examine evidence regarding the types of images that stimulate pleasure receptors in the human brain.

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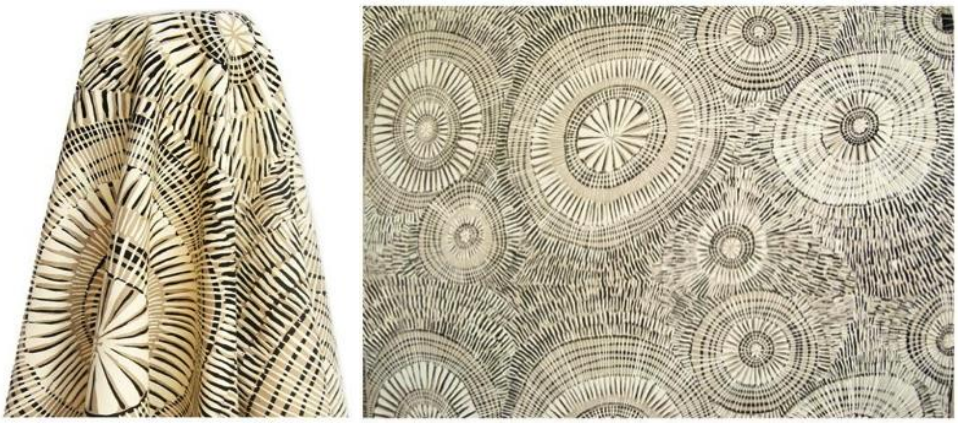

Figure 1. Marita Sambono Fog Dreaming 2012
Source: Fog Dreaming http://nomad-art-store.myshopify.com/collections/fabrics-textiles/products/merrepen-arts-linen-br-fog-dreaming-br-marita-sambono

Digital Reproduction

In an era of digital reproduction, a sense of delight needs to transcend the production processes (Benjamin 1936). The designer's aim for the textile design needs to surpass the manufacturing processes and exhibit a pleasing "aura" in the final product (ibid.). The textile pattern shown in Figure 2 was created using paint and paper. The design was converted into a pattern repeat using a digital process and translated to screens for printing on fabric with screen printing ink. Philosopher and cultural critic, Walter Benjamin, writing in 1936, noted that,

> The technological reproducibility of the work of art emancipates the work from its parasitical subservience to ritual. To an ever-increasing degree the work of art reproduced becomes the work of art designed for reproducibility (Benjamin 1936, 17).

In an age of digital reproduction, mass produced designer products such as watches, bags and cars now parade values of prestige, sophistication and refinement that prior to industrialization were associated with bespoke hand made artefacts. The ritual of creating a one-off original may not be applicable to the design of textiles; however, rituals associated with the traditions of a community may still be at play in *living patterns.* The fabric illustrated in Figure 2, in the *Spring Summer 2012/13 Collection* by Roopa Pemmaraju indicates the textile designer's connection with their Indigenous culture and the successful transition of the design through a digital process to a pattern printed on fabric.

Figure 2. Roopa Pemmaraju Spring Summer 2012/13 Collection
Source: Emergent Magazine. http://www.emergentmagazine.com.au/fashionhaus/news/3694

Pattern: Aesthetics and Beauty

The appeal of *living patterns* involves a response on the part of the observer to the design of a printed fabric. Armstrong (2004) suggests that a response to a beautiful object involves a physical/spiritual binary. Armstrong argues that human life is experienced in two guises: physical and spiritual, and beauty is both physical (the qualities inherent in beautiful objects) and spiritual (the intuition at play when we experience beauty) (2004, 163). Therefore, an experience of beauty can be seen to "consist in finding spiritual value (truth, happiness, moral ideals) at home in a material setting (rhythm, line, shape, structure) and in a way that, while we contemplate the object, the two seem inseparable" (Armstrong 2004, 163). The spiritual values of "truth," "happiness," and "moral ideals" can be identified in *living patterns*. Armstrong (2004) writes of "happiness" as elements of the spiritual ideals of beauty. A sense of celebration and joy is apparent in the "vibrant fabrics with designs of local flora and fauna" created at Merrepen, Northern Australia and shown in Figure 3 (Jackett 2014, 42).

Such ideas about happiness and truth echo Ruskin's views of the experience of beauty, as a journey that is "accompanied first with joy, then with the love of the object, then with the perception of kindness in a superior intelligence" (Ruskin quoted in Kirwan 1999, 79). Kirwan adds that, "beauty thus always comes with… a sense of the abundance, the plenitude of life" (1999, 124). Kant observes that, "the beautiful brings with it a feeling of the furtherance of life" (Richter 1978, 28). Beauty can be edifying, filling us with a sense of something profound and providing an inspiration that "feels in some way revelatory" (Kirwan 1999, 63). In summary, a sense of joy and happiness appear to correlate to the active and positive attributes of splendid or *living patterns*.

Figure 3. Fabrics from Merrepen Arts Festival, Northern Australia. Kieren Karrijpul *Coolamon* 2012. Marita Sambono *Large leaf* 2012. Kieren Karrijpul *Dili bag* 2012.
Source: Photograph by Bobbie Ruben

Further literature regarding beauty suggests it may minister to human longing for the unattainable. Longinus, (c.1st century) believed that in beauty "we perceive around us the end for which we were created, for we have an unquenchable love for what is greater or more divine than we are" (Kirwan 1999, 35). The eighteenth century writer, Goethe, noted that: "our greatest happiness rests in our longings and that true longing may have as its goal only what is unattainable" (Kirwan 1999, 68). While these ideas are speculative, the beauty of patterns such as those in Mamluk carpet designs (Figure 4) suggest an ideal divinity that is implied and yet unreachable.

Armstrong claims that "truth and moral ideal" are characteristics of the spiritual nature of beauty and these may relate to pattern exemplars. Moral ideals are an expression of a community's culture and truth to these ideals and can be seen in examples of both Mamluk carpets and Indigenous printed textiles. A deeply held system of beliefs and a highly elaborate symbolic code is apparent in artefacts of both cultures. For example, Mamluk carpets produced in the fifteenth and sixteenth century in Cairo, exhibit sophisticated abstract designs, symbolizing spiritual themes developed in response to the religious restrictions placed on figurative representation (Black 1994, 51).

Figure 4. Mamluk Carpet Design
Source: Mamluk carpet, http://rugsandmore.com/wp-content/uploads/2014/04/Finest-Mamluk-Rug_35274.jpg

In a very different part of the world, Indigenous people in Australia developed a highly sophisticated iconography with a deep connection to country revealing the true and moral ideals of their culture (Rose 2005). Indigenous textiles can reflect the significance of ancestral stories as noted by McTaggart who describes Indigenous textile designs, writing, "our stories have been told and passed on for thousands of generations. We are now telling these old stories in a modern way" (2014, 4). The textile pattern, *Fog Dreaming,* (Figure 1), indicates the cultural importance and the dynamic nature of the site located in Ngen'giwumirri, Northern Territory, Australia. Sambono (2012) observes that:

> They are small springs and holes in the ground where steam or fog come off the warm water below. They occur on the edge of floodplains and are surrounded by spring pandanus, yerrgi, and pink apple trees, yerrmanmanba. The fog wafts around these trees and is conspicuous during the cold weather of the mid dry season, especially in the cool of the early morning. These sites have special spiritual significance for Ngen'giwumirri people, especially for Marita as it was one of her deceased grandmother's dreamings, and they are found on her traditional country.

The pattern depicts the dynamic, seasonal rhythms and movement of the fog and sensitively alludes to the spiritual significance of the site, implying a truth and reverence for the moral ideals connected with a site of cultural importance, where the fog dreams.

Armstrong's suggestion that "truth and moral ideals" are spiritual characteristics of the beauty of artefacts is aligned with the twentieth century philosopher Ludwig Wittgenstein's view. Wittgenstein's commitment to moral ideals as a feature of significant cultural products is noted in his claim that, "aesthetic appreciation is concerned, not with liking or disliking a work of art, but with understanding it and experiencing its features, right or wrong, better or worse, close or distant from an ideal" (Budd 1992, 446). Wittgenstein's suggestion of experiencing a work of art as close or distant from an ideal supports Armstrong's proposition that "truth and moral ideals" may be at play in the living patterns of textile designs. In summary, the ideas suggested by Armstrong: "truth, happiness and moral ideals" appear to be useful concepts in relation to

identifying spiritual attributes of appealing patterns. In the next section, ideas associated with perception and the material setting (rhythm, line, shape, structure) will be reviewed.

Wakefully Relaxed: Pattern and Perception.

Biederman and Vessel (2006) contend that people derive great pleasure from viewing a dramatic and changing vista such as a rolling ocean at sunset, due to a reward structure in the brain that seeks information through the senses. Numerous studies have shown that people prefer natural scenes over images of the built environment (Grahn and Stigsdotter, 2010, Biederman and Vessel 2006, Kaplan and Kaplan 1989). When people view natural scenes, areas of the large rear portion of the visual cortex are activated and this region contains a high concentration of receptors that are linked to the experience of pleasure (Biederman and Vessel 2006).

Views of natural scenes have been shown to stimulate a wakeful state of relaxation and well-being; to improve mood, reduce stress and reduce negative emotions (Biederman and Vessel, 2006, Hartig et al, 2003). In contrast, views with less visual richness, such as a blank wall or a street without trees are processed in the small forward section of the visual cortex generating few pleasure receptors and inducing boredom (Ramzy 2015, 43). Images of natural scenes, such as photographs, can have restorative healing benefits (Ryan et al 2014). Importantly, "people can engage emotionally with forms and surfaces the same way as they engage with real natural elements" (Ramzy 2015, 43). Therefore, it is feasible to apply research findings in relation to brain activity to the field of pattern design and this may assist in identifying features of rhythm, line, shape and structure that coalesce to create *living patterns*.

Preference for Natural Features

Wilson's (1984) biophilia hypothesis suggests that the reason humans prefer natural scenes over the built environment is because of our evolution in nature or natural spaces. Possibilities for experiencing nature are often reduced in modern urban environments (Ramzy 2015). The preference for natural scenes has been researched in terms of fractal geometry. Fractals are composed of "fractured shapes, which possess repeating patterns when viewed at increasingly fine magnifications" (Hagerhall et al 2004, 247). Fractal geometry is common in nature and many natural patterns are built from fractals including the nature of the human brain (Ramzy 2015). Fractal geometry is evident in views of mountain ranges and coastlines that contain irregular forms and numerous colours and textures (Hagerhall et al 2004).

In contrast, Euclidean geometry includes shapes such as circles, squares and rectangles that are common in the built environment (Ramzy 2015). Scans of people's neural and parasympathetic system reactions when exposed to views in the natural (fractal) and built (Euclidean) environments, showed that subjects "were more wakefully relaxed" when exposed to natural landscapes" (Ramzy 2015, 42). These findings lead the authors to speculate on the idea that fractal imagery resides in long-term memory (Hagerhall et al 2004). This research supports the biophilia hypothesis, as the human visual system has evolved over millions of years in a natural fractal environment and only recently, by evolutionary time scales, have people lived in a primarily Euclidean environment, composed of straight lines and limited spatial scales (Rogowitz and Voss 1990).

The benefits of spending time in nature increased with higher levels of biodiversity according to Fuller et al (2007). An experience of the author reinforces the value of biodiversity in natural scenes. In Australia, bush walking in a natural environment is a pass-time enjoyed by many people. On one occasion on the drive home, following a five day bush walk, during which time the author's visual system adapted to the natural arrangement of plants and undulating landscape, a long hedge created a visual shock. The hedge was composed of one species of plant and it was trimmed with a square, flat edge. The hedge appeared to be overbearing and very

different to the natural and divers arrangement of plants in the bush. Monocultures are rare in the bush and there is significant variation in the position and size of plants. During the next few weeks in the city, the author's visual system adapted to numerous instances of urban surfaces in the built environment. The sight of the hedge may have been less confronting following the readjustment of the visual system. Nevertheless, the experience led the author to the conclusion that a natural specimen in a repetitious and constrained manner is not appealing to our visual system. This experience reflects research regarding increased benefits with higher levels of biodiversity (Fuller et al 2007). It also introduces ideas of novelty, complexity and order that are relevant to the design of patterns.

Novelty, Colour, Perception and Pleasure

People are attuned to detecting novelty (Biederman and Vessel 2006). Historically, the ability to notice changes in an environment may have aided people's chances of survival by signaling danger or a source of food. Because the outcome of a novel experience can be dangerous, "it is appropriate for an animal to be alert and prepared for fight or flight in the face of novelty" (Wiggins et al 2014, 3). This resultant tension and its subsequent release can generate a positive feeling (Wiggins et al 2014). The human preference for novelty is evident when we consider the case of an enjoyable conversation. While we may enjoy the conversation on the first occasion, we would be bored if we were to repeat it (Biederman and Vessel 2006). Our species' fondness for colour and texture may have a neural basis, as endomorphin activity in the region of the brain associated with processing this information may produce pleasure (ibid.). The activation of the pleasure receptors in the brain suggest that novelty, colour and texture may be factors in patterns we find appealing.

Ordered Complexity

While novelty may be a pleasing attribute of pattern, the degree of order and complexity are important considerations in relation to biophilic design, where design elements reflect affinity with nature (Saligaros 2013). The human eye has evolved to perceive "fine detail, contrast, ornament, hierarches of scale, color and visual connections" (Ramzy 2015, 43). In cases where patterns are too complex, people can experience nausea, headaches, and dizziness (Ryan et al 2014, 68). This was the case in a building where " the interaction of multiple wall paper patterns, complex patterns in carpets and moiré patterns in seating fabrics cause surfaces to appear to move" (ibid.). Therefore, designs of patterns need to balance complexity with order (Ramzy 2015). To achieve "ordered complexity" and visual coherence, sensitivity to scaling, connective symmetry, fractals and mystery should be considered.

Visual coherence can be achieved through the use of scaling (Ramzy 2015). Scaling is a feature of fractal geometry where there is a cascade of details from largest to smallest as illustrated in the cactus image shown in Figure 5. Within a hierarchy of scale, there are many small elements, some intermediate elements, and a few elements of the largest size (Ramzy 2015). Further systems and patterns that have a relationship to natural structures have been used since antiquity to create pleasing proportions and a sense of awe in architectural spaces and textile patterns (Ramzy 2015; Joye 2011).

Examples of mathematical systems that relate to naturally occurring patterns include the Golden Ratio (1:1.618), Fibonacci numbers, Penrose patterns and Hambidge Philotaxian patterns. An example of the later is shown in the cactus in Figure 5. These systems have been used over many centuries to create "ordered complexity" in buildings in various regions of the world, including the Middle East and Europe, over many centuries (Joye, 2011). Over the past few decades, mathematical formulas describing factual geometry have been devised, providing

opportunities for contemporary designers to create patterns based on these formulas with the aid of computer programs (Ramzy 2015).

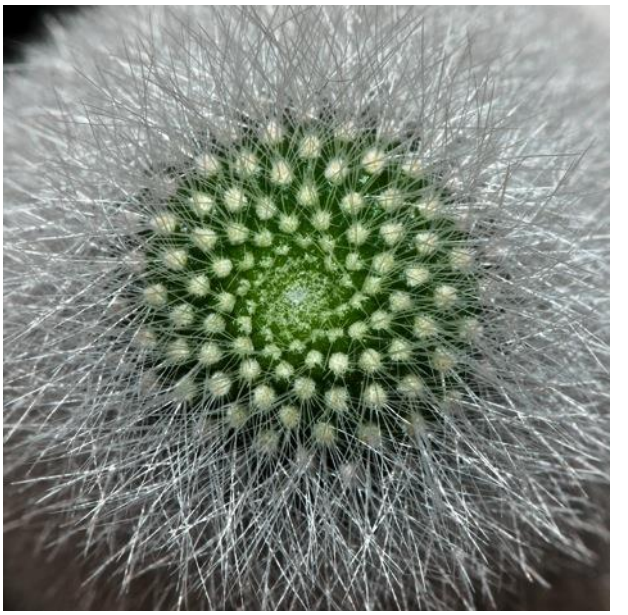

Figure 5. A cactus is an example of a Hambidge Philotaxian pattern
Source: Cactus. https://www.flickr.com/photos/paulmccoubrie/14202249506

Mystery

A further tenet of biophilic design is the idea of mystery. Mystery is "a spatial condition characterized by the promise of more information" (Ryan et al 2014, 69). "Mystery engenders a strong pleasure response with the brain that may be similar to that of anticipation" (ibid.). Mystery in the context of a textile pattern could involve wandering visually through a design or it could imply an experience of being transported where a viewer experiences a cognitive journey in the presence of a *living pattern*.

The Mamluk Carpet design shown in Figure 4 indicates rich patterning, novelty and a sense of mystery (Ryan et al 2014). The symbolic forms in the pattern are composed of geometric, or Euclidean shapes, such as circles and squares, set with a hierarchy of scale (Joye, 2011). These varied forms and rich colours resonate with the fractal forms and variation of colour and scaling found in nature (Black 1994). There appears to be an ordered complexity to the designs of the Mamluk carpets that resonates with those we find in the principles of biophilic design (Ramzy 2015).

Mystery might be a feature of the *living patterns* created by Indigenous artists in remote regions of Northern Australia (Figure 2). Indigenous people believe that "country is a living entity with a yesterday, today and tomorrow, with a consciousness and a will towards life" (Rose 1996, 7). According to Indigenous belief systems, country is lived in and lived with, as their country can hear, smell, notice, care and be sorry or happy (Rose 1996). This deep spiritual reverence for country and the connection with natural rhythms and pattern can be seen in fabrics such as *Fog Dreaming* (Figure 1). The mark-making in this pattern is hand painted and this may contribute to the "ordered complexity" of the design. Handmade marks provide a window into the world of the maker, and this connection can contribute to the beauty and mystery of a pattern. The rich and highly developed system of symbols, which has evolved over 50,000 to 60,000 years of cultural history, has a deep connection with nature which appears to inform Indigenous

pattern making (Bragg and Reser 2012). Textile designs such as these can be culturally significant and rich in mystery.

In summary, theories of aesthetics along with evidence from studies of how the brain functions when viewing information-rich designs, suggest that features that contribute to mesmerizing patterns include: truth, happiness and moral ideals, fractal geometry, hierarchies of scale, texture, colour, novelty, ordered complexity and mystery. The printed textile patterns designed by Indigenous artisans in remote regions of Northern Australia share a depth and richness of beauty with celebrated textile patterns from the past such as Mamluk carpets. Such patterns can thrive in an age of digital reproduction when the design activates the pleasure centres in the brain and resonates with those living patterns we find in nature.

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