

Less is more or less more: perceptual health in minimalist design

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The saying by Ludwig van der Rohe, that "less is more", has become a well-known truism about the supposed superiority of minimalism over other design forms, especially decorative compositions. Here, the avenues of ugliness, beauty and the sublime are used to revisit a key inspiration of minimalism, namely, Japanese landscape design and architecture. In particular, this article is presented from the viewpoint of visual psychology, examining some key aspects of what these designs offer the human visual system at various neural levels. Knowing on what "diet" of visual signals our perception and cognition flourishes, a comparison of recent examples of minimalist design there is more or less of in each case. The conclusion is that, in neural terms, less than the necessary sensory stimulation results in more mental agitation than is necessary, especially when individuals need to function within a visual environment for an extended period of time.

Key words: Mies van der Rohe, minimalism, Japanese landscape design and architecture, perception

Minder is min of meer meer, perseptuele welstand in minimalistiese ontwerp

Ludwig Mies van der Rohe se stelling dat minder meer is, het 'n aanvaarde vanselfsprekende waarheid geword wat die veronderstelde meerderwaardighede van minimalisme oor ander soorte ontwerp bevestig, veral oor dekoratiewe komposisies. Aakligheid, skoonheid en die sublieme as temas word hier aangewend om die belangrikste inspirasies van minimalisme na te gaan, naamlik Japanese landskapontwerp en argitektureur. In die besonder word hierdie artikel aangebied vanuit die standpunt van visuele psigologie en ondersoek word ingestel na wat genoemde ontwerpe die menslike visuele sisteem op verskeie neutrale vlakke bied. Wetende op watter "dieet" van visuele seine ons persepsie en kennis floreer, ontbloeit 'n vergelyking tussen resente voorbeelde van minimalistiese ontwerp en klassieke Japanese "minimalisme" sleutelverskille van wat daar visueel meer of minder in elke geval van is. Die slotsom is dat, in neutrale terme, minder as die vereiste sensoriese stimulasie meer mentale agitatie veroorsaak as wat nodig is wanneer individue vir 'n uitgebreide tydperk binne 'n visuele omgewing moet funksioneer.

Sleutelwoorde: Mies van der Rohe, minimalisme, Japanese landskapontwerp en argitektureur, persepsie

In the oldest surviving account of Japanese gardening literature, the purpose of creating a garden is given as capturing and recreating the essence of nature (Shimoyama, 1976). On the gardener's behalf, this necessitates an intimate understanding of nature and working knowledge of the practical methods and visual effects needed in actual garden construction and maintenance to create the landscape that directly flanks architectural structure while integrating it elegantly with its greater spatial surround. In this sense, the Japanese garden has often been described as a buffer or transition between untamed nature and human architectural design (Nitschke, 1993a; Itoh, 1998). The Japanese garden is an artificial construct, and could be considered a mere decorative naturalistic composition were it not for the fact that its design consists of visual details that are carefully distilled from real and idealized natural landscapes (Shingen, 1466) to the extent that nothing can be added or subtracted without completely disrupting the overall balance and harmony of the resulting visual composition. This is especially observable in the more abstract dry rock gardens (see the description of the *Ryoanji* temple garden, by Akisato (1799), for example). In my experience, it is specifically the visual character of the condensed metaphor of nature that is most likely to suffer when Japanese gardens are constructed outside of its traditional enclaves. The aim of this paper is to focus attention on the visual detail of garden design elements, in an attempt to better understand how it provides a minimal representation of the complexity of nature while incorporating architectural features to the extent that it function as a perceptual buffer between human-made design and natural shape. At a first glance, the items discussed in what follows may seem self-evident. Yet, skilled designers of Japanese gardens are able to tell, just by looking at a photograph, if a garden is actually located in Japan or not, or whether it is authentic (i.e. created within the classic school of Japanese gardening) or not, suggesting that the visual

appearance of the Japanese dry rock garden has not yet been thoroughly grasped in the many instances where such gardens have been recreated outside of Japan. Given the international proclivity of Japanese garden design, a firm grasp of this difference could therefore lead to refinement of existing naturalistic landscaping practice, especially in Western design.

Creating a transition space between nature and architecture

The two main existing classical texts on Japanese gardening design, the 12th century *Sakuteiki* (Shimoyama, 1976) and the 11th century *Illustrated gardening manual* (Shingen, 1466) expound various guidelines for creating landscapes that follow classical ideals shaped in acute observation of nature and harmonious coexistence of humans with each other and with nature. By the 16th century, the visual style of Japanese dry landscaping embodied the classical design guidelines in a number of canonical elements, having undergone numerous developments especially towards the end of the *Muromachi* period (1333-1573), when Japanese arts witnessed a high degree of sophistication and increased abstraction. The high level of abstraction in Japanese gardens culminated in *karesansui* (lit. dry mountain water) - dry rock gardens where the presence of moving and tranquil water features set in vast landscapes is suggested through the shapes and physical layout of rocks and other materials in the absence of any real water. Dry rock gardens are recognized at present as characteristically Japanese. The style could be considered a form of minimalist design in its own right, since it was deeply inspired by ascetic ideals of Chinese literati, and has been continually refined by an increasingly declining imperial court that maintained its elegance through refined simplicity; later, in response to the opulence of the rising military ruling class in Japan; ironically, the eventual impoverishment of the military class and the development of the reactionary tea cult further dramatically shaped the minimal character of what are today considered as classic Japanese garden design (Nitschke, 1993a; Shingen, 1466; Slawson, 1987).



Figure 1.

Chert stone set in star moss on a raked expanse of natural felspar gravel, against an earthen wall. *Ryoanji* dry rock garden, Japan.

The typical dry rock garden perimeter consists of a combination of earthen walls and topiary hedges, enclosing a relatively empty courtyard covered in various kinds of moss and *shirakawazuna* (lit. white river sand) - a specific type of coarse felspar gravel found along the eastern foothills of Kyoto. Into this expanse would be set some moss covered mounds of clay,

rocks of various sizes, and clipped bushes, heavily pruned trees and a variety of other plants (figure 1). These compositions are as artificial as they are naturalistic, and the result is a minimal composition of a great degree of controlled order, complexity and richness. The *Ryoanji* temple in Kyoto epitomizes the minimality of classical Japanese dry landscape architecture in that it seems impossible to add or subtract from the composition without destroying the immediately felt harmony and balance of the design (Akisatoh, 1799). It is an example of *Shoin* (lit. writing room) style architecture, developed during the *Muromachi* period as relatively empty spaces where the seating position of the viewer is carefully related to the appearance of the court garden and the amount of light available for reading and writing.

The visual textures found here are exceedingly rich in natural structure, yet subdued: Earthen walls are executed in a range of ochre yellows and oranges, and the oils and straw mixed into the mortar eventually stain the walls in rich reds, browns and black, while finely grained mosses and lichens add shades of grey, blue and green to the earthen surface. The result is fractal-like in appearance (Mandelbrot, 1977), with the same visual details appearing and reappearing at many spatial scales. Although beyond the scope of this presentation, it is worth noting that human cognitive performance during endurance testing is enhanced in visual environments with fractal characteristics (Taylor, 2002; 2008). Hedges provide roughly planar surfaces covered in an evergreen texture of foliage. Feltspar, a whitish, highly irregular gravel with grains ranging from fine sand to about two centimeter in diameter, is mottled with black, brown, green and transparent granules. With various line motifs raked into this gravel, the visual result is again that of a grainy, rich fractal pattern appearing among roughly planar and linear boundaries. Rocks are chosen for the grain of their visual texture, the articulation of facets on the rock surface, and usually become visually enriched by finely grained lichens. The coveted star moss (*Polytrichum juniperinum*) is not simply green, but ranges from black (old growth), dark and red browns, to various greens towards the tip of the moss foliage. Depending on the amount of sun and moisture, the green leaves close or open up, revealing not only different ranges of colour, but also appearing soft and downy, or spiky and brittle. In effect, the materials and vegetation in the garden therefore constitutes a very complexly articulated visual texture, set within combinations of rectilinear surfaces and highly irregular natural facets. The garden is usually also set against large treetops with dense foliage and mountainous scenery outside the courtyard, contrasting the degree of linearity of the natural textures and rarified natural shapes inside with the visual appearance of abundant untamed nature without. Both levels of (artificial) naturalistic and truly natural complexity are therefore present in this visual composition.

The architectural perimeter of the garden extends into the structure of buildings flanking the courtyard. Traditionally, these consist of many spatial scales and layers of rectangular frames in wood, clay and paper, and various degrees of opacity that lends a very complex visual character to interior illumination and shading while also framing the garden scenery in a complex manner (Nitschke, 1993b). The colours of clay and wooden (mostly cypress and cedar) surfaces reflect the subdued pale and dark colour schemes of garden design elements. The onlooker is thus presented with a gradual but non-trivial transition from the geometry of rectilinear frames to the intricate fractals of untamed nature.

Trees are typically pruned to have as few branches as possible (Shingen, 1466), and are shaped with specific viewpoints from within the building in mind. Rocks are also set in a similar approach, with rocks facing specific predetermined viewing locations, the size of the largest rock determined by the size of the courtyard, the aim being to create compositions that are relatively sparse but visually layered so that all the design elements from front to back are visually accessible*, and the clusters of items themselves, and the spaces between them arranged in a fractal formation (Van Tonder, Lyons & Ejima, 2002). The effect is that of a

canonical composition, similar to classical Japanese painting where natural shapes (e.g. trees) are not shown in natural perspective, but such that all leaves and flowers face the viewer. In this sense, the garden design intimately suits the format in which humans experience the visual world cognitively, rather than just perceptually. Cognitively, humans recognize and remember objects in terms of so-called generic (or familiar) views in which all the characteristic details of that object are visible at a single glance with the minimum necessity for additional cognitive reconstruction of missing visual detail (Palmer, 1999; Palmer *et al.*, 1981). For example, the generic view of a horse is that of the animal seen from the side, with its legs, body, neck and head in full view; the generic view of a human face is either as it appears when viewed from the front or in profile, from the side. The natural human tendency in drawing (at least in pre-realist painting) leans toward this type of canonical depiction of objects (Willats, 1997). The depiction of garden compositions (i.e. the spatial arrangement of rocks and vegetation) in some classical Japanese illustration work suffer far less from distorted or awkward perspective than the depiction of architectural structure (Van Tonder, 2007), further evidence that the composition of garden elements in dry rock gardens suits the inner organization of human visual cognition. The structures of the Japanese dry garden are thus rich sensory stimuli, but cognitively effortlessly grasped even though shapes are complex in themselves. For example, cognitive complexity is maintained by avoiding the predominance of more trivially predictable structural features, such as symmetry, spatial alignment or pure geometry in the shaping of branches, foliage and rock features.

Selected examples of modernist landscape architecture

Fallingwater (1935), a private residence (figure 2) designed by Frank Lloyd Wright (1867-1959) is significant for this presentation since it represents an important instance of Western architecture set within a natural surround, while also being deeply influenced by Japanese design (Meech, 2001). The subdued colours, choice of materials, the softness of edges, layering of rectangular frames, gradations from smooth to rough surface materials and so forth brings to mind the guidelines of the classical Japanese gardening texts. It most significantly deviates from the classical landscape in the sense that the transition from architecture to nature is only buffered by the visual texture of layered slate walls; there is no further visual layering, such as coarse gravel, richly textured but controlled foliage, artificially set rocks or walls between the house and the natural surroundings.



Figure 2.
Fallingwater, Frank Lloyd-Wright (1867-1959), USA.

Other designs by modernists, such as Mies van der Rohe, Loos, Neutra and others, most notably deviate from the visual function of the Japanese garden in this sense; even though the ideal is to embrace natural space, intertwining man made design with natural forms, and rendering architecture within simple frameworks using rich textures in unadorned surfaces, some key differences, in my opinion, are as follows. The transition from rectilinear man-made space to the outer surround is usually much more abrupt than in the dry rock garden, as evinced from buildings set directly in unadjusted natural space, or where spatial limitations do not permit, directly in an urban wilderness. Where gardens intertwine with architecture, the visual textures provided are often strikingly rectilinear and visually homogeneous (e.g. lawns and concrete pavements; where gravel is used, it is usually not fractal-like in appearance, such as with coarse felspar, but consists of the uniformly coloured grains typical of quarried and mechanically crushed stone - see figure 3, for example), the arrangement of objects is such that it does not offer canonical views (e.g. branches and foliage maybe very lush, without offering a view to what is occluded beyond) and arrangement without the clear impression of an extensive fractal landscape that continues beyond the dimensions of the textural elements, the objects in which those textures are found, or the larger composition of objects that constitutes the garden and the landscape beyond its perimeters (e.g. rocks are not usually featured in naturalistic clusters buried in the soil, but piled or lined up in geometrical clusters that appear to belong on their own, not so much as an integrated aspect of a landscape forged through the elements; preferred rock shapes are often symmetrical and geometrical; topiary is also often presented in relatively symmetrical clusters featuring relatively geometrically pure shapes; the choice of garden plants often include species with naturally symmetrical and geometrically striking shapes that suggest independence from the forces that shape natural structures on all levels). As a result, the modernist use of these elements constitutes dominant perceptual wholes in themselves, rather than suggesting a continuous structural unity with the outer and inner landscape relative to the scale of the garden. The geometrical purity of modern frames and planar surfaces contrasts with the subtle linearity of the slightly eroded clay walls, brocade of expanses of moss, the straight but rugged edges of patterns raked into gravel, and the grain of planed but aged wood in traditional dry rock gardens.

The transition from architecture to landscape further usually differs due to the choice of construction materials. Steel, aluminum, painted surfaces, concrete, cut stone and glass dictate a different visual landscape than that accomplished through wood, paper, stone and clay. The complexity of the rectangular layering of light and shadow in traditional Japanese architecture is hardly reproducible in another medium. In metal, it seems unavoidable to create box or cage-like structures, since visually the resulting lines suggest an adherence to nearly pure rectilinearity. The titanium-clad structures by Frank Gehry offer an alternative to this condition, even if it does not address the problem of creating a gradual visual transition from architectural interior to exterior. It helps that metal surfaces and glass reflect the colour schemes of the surround, but as such the colour tones in architecture and the surround often differ distinctly, and visual texture in modern architectural surfaces are qualitatively different from those found in classic dry rock gardens, thereby sharpening instead of bridging the transition between architecture and nature. Here, *Fallingwater* is an example where the colour scheme and use of surface textures are intended to narrow the visual gap.

A modernization of the Japanese garden leads to a similar position. In the later work by Mirei Shigemori (Tschumi & Saito, 2005), gravel becomes replaced with paved surfaces of smooth pebbles, quarried gravel, coloured sand and grids or wavy curves made with inlays of quarried stone slabs and roof tiles, set against a backdrop of various bold motifs of tied bamboo fencing, and with sharply pointed rocks of various colours, set in the absence of moss and other foliage (figure 4). Compared to his early work, before Shigemori modernized the Japanese

garden, the later designs appear stark and bold, with a significant shift in the use of elements that might count as beautiful or sublime.



Figure 3.
Singleton House, Richard Neutra (1892-1970), USA.



Figure 4.
Sato Museum Garden, Mirei Shigemori (1896-1975), Japan.

The beautiful, the sublime and the ugly

Edmund Burke (1757) articulated aesthetic responses to the first waves of industrialization to European society by differentiating between the *beautiful* and the *sublime*, as opposed to *ugly*. According to Burke, the *beautiful* is that which is aesthetically pleasing, whereas the *sublime* relates to what has the power to compel and destroy us.

Burke understood beauty and sublimity in terms of the Aristotelian causal structures of formal, material, efficient, and final causes. Passion formally causes beauty, while materially, it is encompassed by compositions of smooth and polished components, the whole being light and delicate, clear, bright in colour, suggesting smallness, while its dominant features deviate subtly from right angles; the efficient cause is a calming of the mind; the final cause is God's providence. The sublime formally derives from fear; materially, sublime compositions were vast, rugged and negligent, solid and massive, dark and gloomy, following the dictates of right angles, or where not, firmly deviating from it; its efficient cause is mental; the final cause is the creation and defeat of Satan. Ugly compositions, in contrast, are essentially that which is unpleasant to look at.

In Burke's analysis, the shiny, polished and smooth appearances in modernist design qualify as a source of beauty, especially when set in the light and transparent frames often used in modernist architecture. Intimacy is suggested especially in closely nesting the purely geometrical, directly adjacent to various natural objects. In this also lies an aspect of sublimity: the dwelling is often cast directly into the vastness of nature, or the wilderness of the urban environment, in what constitutes a sharp contrast. The use of lines are strongly sublime, either rectilinear or clearly breaking away from the grid.

Burke's analysis applies also to an articulation of beauty in dry rock gardens. For example, it lies in the intimacy of the spaces enclosed by the courtyard walls and wooden frames and lattices of the adjacent buildings. By closing in the courtyard while revealing a glimpse of the outer world, the warm earthy coloured, richly textured walls enhance the contrast between intimately contained and vast outer space. The choice of materials, especially those used in the interior, lends a sense of warmth to the space. Soft light and layering of shadows, as well as the choice of materials, foliage, shapes of branches etc. heightens the impression of 'softness' - a very important aesthetic even in present traditional Japanese gardening practice. The naturalistic shapes are deliberately asymmetric, yet simplified, to provide subtle deviations from simple rectangular grids and predictable arrangement. The rich natural textures of all the materials further break the limitations of rectilinearity, reducing hardness and straight lines.

Sublimity, in Burke's sense, is embodied by the few glimpses of a wild untamed world outside the courtyard, and by the fractal-like garden composition that could exist at any possible scale. The beauty of the physically small setting of rocks could equally well signal the vastness of rugged mountains or islands in a forbidding sea of clouds. The many layers of shading of the interior, and the colour schemes of architectural and gardening materials span enough dark and subdued tones to evoke the sense of a dark and gloomy retreat, removed from a beautiful world of bright daylight. The many gradations of rectilinear structure suggest a world pervaded by the domination of intelligence. The weather, time of day, and mental and emotional state of the onlooker determine which visual landscaping features dominate perception and cognition; a different mixture of beauty or sublimity prevails depending on the mental and external viewing conditions in the designed landscape.

Discussion and conclusion

Considering that Japanese dry rock gardens are artificial recreations of idealized nature, and in that sense are naturalistic *decorations*, one might be tempted to conclude that the dry rock garden can be further reduced and distilled into a more minimal form. In the previous sections I attempted to show that the design elements in Japanese dry rock gardens all contribute towards the main function of the garden design to begin with, namely to capture the essence of nature and to provide a transition between architectural structure and the greater surroundings external to that architecture. Combined with the fact that only a minimal number of design components are

used in each composition, it is unlikely that the Japanese dry rock garden is a merely decorative accessory added onto architecture; reducing the design beyond these key elements may result in a garden that appears even more minimal, but without the rich visual clues that support direct perception of the many levels of integration and transition between architectural structure and the natural realm, in other words, perceptually oversimplified.

As a new awareness of the power in simplicity of expression paved the way towards the architectural revolution of the early twentieth century, the wisdom gleaned from modernization were captured in the now all too well known aphorisms, such as "less is more", and "ornament is sin". Far from mere apostasy, these insights reflect the discoveries by architects such as Ludwig Mies and Adolf Loos, respectively, from which lauded a truly original new era of architectural design. Some of their key insights were that decorativeness diminishes the universality and timeless appeal of the human-made environment, and as such equates to an unnecessary expenditure of resources and energy - and thus a sin against nature (Loos & Opel, 1997(1908)); while ornamentation is intended to make designs fashionable, it does so at the cost of rapidly forcing design out of fashion again, as fads come and go; *less* ornament reveals *more* of the true structure of design, and leaves it *more* accommodating towards personal expressiveness of its human occupants. Their preferred means for achieving less ornate design combined the use of rich materials, left unadorned in simple surfaces, with very simple, nearly skeletal architectural structures, often in a setting intertwined with naturalistic space.

In modernism, the comparative homogeneity of surface texture and the geometric purity of design element shapes and their spatial arrangements often constitute a visual pattern much less infused with the fractal qualities of natural structure, and thus less effective as a transition space between architecture and nature - a non-trivial problem for architecture. Simply introducing naturalistic elements into a design does not help overcome this state: even authentic modern recreations of Japanese gardens easily fail to convey the subtle aesthetic of classic designs. This is not to say that modernist design is wrong or ugly, but it implies that the key elements contributing to the mental experience of beauty and sublimity, specifically in providing a transition space between architecture and nature differ significantly from that of classical Japanese architectural environments; the latter, ironically, has played a role in the modernization of architectural design. For example, Mies van der Rohe was significantly influenced by the work of Frank Lloyd Wright and activities of the Bauhaus movement (Schulze, 1985). Both Lloyd (Meech, 2001) and the Bauhaus (Behrens, 2004), like many other Western designers and schools, were heavily influenced by Japanese art and architecture - Lloyd Wright first visited Japan in 1905 - an inspiration suggesting that the emphasis on reduced ornamentation in their designs is far from accidental (the Katsura detached palace in Kyoto, for example, has had a huge influence on modern Western architecture and design; Lambrecht, 2004). Many key ideas in classic Japanese design are echoed in the minimalist revolution: rich materials, simplicity of surface, skeletal box-like architectural frames, and a more intimate interplay with naturalistic space. From a Western perspective, Japanese architecture was imbued with a timeless, if not futuristic, simplicity that seemed devoid of decoration typical of nineteenth century Western design. Even if Western society has projected much of its own concept of minimalism onto Japanese design, the apparent minimalism of Japanese design resulted from a deliberate and extensive process of reduction of superfluous design elements, as discussed earlier in this paper.

Simply creating fractals does not solve the problem. A polished slab of marble may be a visually fractal texture, but if this fractal does not harmoniously relate to the fractal and geometric qualities in the rest of the design, including the outer surroundings beyond the perimeter of the immediate landscape, it risks creating visual disorder (besides being ornamental). The fractal must appear in many forms at many spatial scales without an obvious continuation, but with enough clarity that its connectedness to the entire landscape can be subliminally sensed.

Simultaneously, various layers of rectilinearity should coexist within this fractal to various degrees of visibility. Impenetrability of the order and complexity of the design can be avoided by artificially shaping and arranging design elements such that their formations conform to a fractal character where the complexity of natural form is reduced to a form that supports effortless perception and cognition of the landscaped elements.

Rudolph Arnheim, a Gestaltist who was also deeply inspired by the architectural designs in Kyoto (Arnheim, 1966), remarked that stimulating the visual senses below their capacity for complexity was nothing short of inducing perceptual frustration in the mind of the observer (Arnheim, 1969). Here, Arnheim provides an important clue as to how modern recreations of classical Japanese dry rock gardens may fall short of bridging the gap between architecture and nature: the modern does not always sufficiently address the needs of the senses, whereas the classic dry rock garden satisfies sensory experience to enable a cognitive state of minimalism as opposed to a state of mental frustration. For the modernist minimalist, ornament would constitute the pinnacle of *ugliness*, whereas for Arnheim, ugliness translates as mental frustration, i.e. hypo-stimulation of the senses. In Japanese dry rock garden design, *ugliness* equals deviations from classical naturalistic ideals (Shingen, 1466; Van Tonder, 2006). The ideal composition for each of the above comprises of a different mixture of both beauty and sublimity.

This approach culminates in a visual environment where the visual sense is stimulated to its full capacity, but not over-stimulated: There are no harsh contrasts or vivid textures, or symmetrical objects or alignments that could tug on the focus of awareness of the onlooker. As such, the more primitive aspect of the act of vision reaches satisfaction, while the cognitive apparatus effortlessly grasp the presented elements. Reducing the visual load in this manner leads to a mental minimalism where the mind is left with room to more calmly observe the profundity - whether beautiful or sublime - of its surrounds. In this sense, blindly accepting that 'less is more' may seduce one into committing the other sin: Too little visual detail.

Finally, the South African context offers rich untapped potential for refinement through a greater awareness of the aesthetic of classic Japanese dry rock gardens. Designers should seriously caution against constructing quaint instances of Zen rock gardens, where gravel and stones are brought together in trivial compositions and settings. From personal experience, South Africa has some of the most exquisite naturally disintegrating felspar - ideally suited for use in a classic dry rock garden - not to mention a wide range of chert stone that is suitable for rock arrangement. But the full range of classic design elements is locally available: naturally occurring varieties of star moss, many types of indigenous flora that could be used as rarified natural structure in the garden, and a long cultural history of earthen wall construction. Landscape architects should therefore find a wealth of inspiration in Japanese garden design from which to refine their own creative skills.

* A garden may be intentionally designed so that all the rocks are not visually accessible from any single vantage point; more than a directly obvious visual effect, this design aspect is intended to enhance mental contemplation of the world beyond the visual realm. In the *Ryoanji* rock garden, only 14 of the 15 stones can be viewed at a time from any location on the viewing verandah.

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