

AN INVESTIGATION OF RHYTHM AND REPETITION IN ARCHITECTURAL THEORY AND PRECEDENT

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SUMMARY

It is a common sense saying that "beauty is in the eye of the beholder". That aesthetic judgements are subjective is agreed among experts. However, there is also a body of literature that set out principles of design that seem to transcend style and era. Also built work serves as precedent that can be analysed. The focus of this investigation of principles and precedent will be rhythm and repetition.

Introduction

Martienssen (1976) writes that 'style' is merely fashion, and *"the possibility of beauty has never been denied. Although there may be no general agreement on its constituents."* (p9) Libeskind in *Breaking Ground* goes one step further and says *"architects...put our faith in things unseen each and every day"* where *"what is more important to me is that each (building) captures and expresses the thoughts and emotions people feel"* (p288). Perhaps the exemplar of current feeling is Pallasmaa¹, writing in 1996, *The Eyes of the Skin*, which argues that we should not rely on the eyes as a designer, as we experience buildings with all our senses. Therefore aesthetics should be based on the totality of the experience including, the sense of smell and taste.

Burton (1979) takes a different slant regarding aesthetics, as he is of the opinion that houses should be built without cliches (of style), and made of brick, wood or stone with windows as required for light. His reasoning for this stance is based on reducing resource use (p22). Burton's opinion relegates questions of aesthetics to be relatively unimportant. Presumably, this extends to considerations of rhythm and repetition. It is likely Burton is a critic rather than a design practitioner, as making a decision as to what is built raises such questions as, why one would use brick rather than stone or how the windows would be arranged in the facade. Ruskin (1880) in expressing the basis of architectural aesthetics in *The Seven Lamps of Architecture*, perhaps captures best the nature of design, *"as effort based on some constant, general and irrefutable laws of right."* (p3) He concludes a designer should not follow *"partial traditions and dogmata"* but seek out what they know as morally right, and on that basis produce original work. This viewpoint places value on the expression of individual creativity as an aesthetic principle. Again Ruskin is a critic, and may not have understood that the 'partial traditions' or 'rules' allow designers to make decisions regarding what is 'morally right'.

More recent research work shows that designers use 'images' to allow them to reduce the

1 I interviewed him in 1996, the result of this interview was published by the NSW Board of Architects

inherent complexity of the design process (Bennetts 2000). Previously Muschenheim (1965) from a modernist perspective suggests that culturally based philosophic attitudes guide methods and goals, but that the basic elements of form surface and space from precedent can “clarify .. how to produce harmony and a ..pleasing impact on the observer” (p10). It is likely that theory or *philosophy* may influence designers as to what to value, but that precedent is more powerful in providing 'images'.

Rhythm and Repetition in Architectural Theory

Surprisingly still influential, Ruskin wrote in 1880 the *Seven Lamps of Architecture*, speaking of truth and honesty in the use in materials and decoration. He was bold enough to say that all beauty was from the laws of natural forms (p105) and that which was 'natural' is most easily seen and familiar. He argues that imaginative hand work, by necessity making repetition irregular, is the expression of truth and that it was better for a building not be decorated at all than they be decorated machine cut sameness. It is likely these thoughts influenced the simplicity of Victorian Regency design. The idea of honesty in expression has been translated in to honesty of expression of form. This idea of honesty also relates to the honest expressions of repeating buildings as repeating forms.

An extreme proponent of the architect designed standardized suburban house and the repetitive mass produced form was Mumford. In *City Development* (1946) he speaks of standardization and mass production as the way to deliver the refinement and technological excellence of architecture to the people, at an economically reasonable cost. He saw this repetition as a positive aspect in the engineered and planned city. He may be regarded as an extreme proponent of a Modernism that focussed on the technological at the expense of the human, but a close reading of his work does not support this, as for him mass production was to *support* the ideal of the suburban lifestyle in cities. It is perhaps not Mumford's idea of standardization that is questioned today, but his focus on suburbia as the ideal model. Ikea recently has successfully produced a standardized mass produced house and, in Australia, Gabriel Pool has designed and marketed his 'Capricorn' mass produced kit house.

Rasmussen (1962), in his book *Experiencing Architecture* argues from an existential viewpoint that he is not speaking of what may be “beautiful or ugly” as these are subjective, but the he is explaining, the “instrument the architect plays on”, or the principles of the architecture. In explaining the principles of architecture he examines, solid and void, colour, scale and proportion, rhythm, texture, daylight and the way we hear architecture. Rasmussen points out the value of the “one, two” rhythm of repetitive elements is that “*it is a classic example of man's special contribution to orderliness*” (p129). He gives as an example Quirinal Street Rome where with extreme repetition a whole street is made “with majestic serenity” (Figure 1). He speaks of repeated bays in a building that mean nothing individually but together have meaning, “*creating harmony and clarity not tension and mystery*” (p141) He links this repetition to proportion. All of the aspects that Rasmussen says are part of the art of architecture emphasise order. In his own residential work at Aabenraa in Copenhagen, Banehegnet in Albertslund and Skovgaarden, Middelfart, Rasmussen used repetition. This, of course, could be a sensibility related to his era. However his book is still in publication and is still a standard architectural text in Denmark.



Figure 1 Repetition Quirinal Street Rome, Source: Rasmussen 1962:129

Muschenheim (1965) in clarifying the the elements of architecture as 'form', 'surface' and 'space', says of form that “harmony is...when a number of similar or related units are arranged in an orderly and unified composition.” As examples of harmonious compositions he features a street of identical houses in Haarlem, The Netherlands from 1612, another row of identical houses by Oud 1927 and a whole estate of identical houses by Haefeli in Zurich 1937. Repetition is therefore considered to produce harmony and order.

Lynch writing *The Image Of The City* in 1960, emphasises that his research findings showed that while perception is individual, there is a collective image of the city. He isolated 10 'Form Qualities' for urban design. First on the list is 'singularity', or that elements amongst sameness are markedly different. Secondly there is 'simplicity in form'. The third principle is 'continuity', by which he means streets where there is repetition, similarity, harmony of surface and form, common building materials and setbacks (p106). All these principles argue for clarity, where similarity in one area allows distinct difference elsewhere evident, to make the 'image' of the place identifiable. Lynch argues that in single objects called beautiful there is coherence and a link from the detail to the total (p91). However, in a city this order should exist but there should be 'plasticity'. By plasticity he does not mean wilful disorder.

By 1966 Venturi was writing *Complexity and Contradiction in Architecture*. He makes no apology for putting forward his personal opinion. He called for variety in visual experience. It is to be noted that he does not negate the desire for simplicity or aesthetic simplicity from inner complexity and he does not support incoherence, picturesqueness, arbitrariness or subjective expressionism (p22, 25) He suggests that the complexity in form should come from the complexity in programme. He states that there are no fixed laws but that order, repetition and proportion is required to allow the vitality of discord, not that design produce chaos (p46). Venturi does not reject standardization as evidence of strong order, rather he points out that it may produce a lack of a creative use of context. (p52) When Venturi and Rauch designed multi-unit housing in Philadelphia 1963, they used inexpensive elements, dark bricks and conventional windows and repetition. To challenge perceptions the conventional windows were designed to be out of scale and the order 'broken'.

Martienssen (1976) in a discussion of the form of housing states that the individually designed house is a “relic” and an “anachronism” (p16) and that housing architecture is

made of repeated units grouped in blocks, where standardization “*should be seen as an easy availability of high level design than a rigid conformity to arbitrary patterns.*”

One of the most influential architectural theorists is Norberg-Schulz. His publication of *Meaning in Western Architecture* reappraised Modernism. His existential viewpoint ignores the question of the elements, principles or rules and focuses on the meaning of architecture, pointing out that it is the purpose of architecture to make meaning 'concrete'. He explains this using precedent, but then, in an appendix explains his principles of design. He does not mention the idea repetition, instead he talks of the need for the human at an urban level to feel they live within a “structured whole” which 'more than anything else gives him a feeling of identity’ p431. Then Norberg-Schulz points back to Lynch and explains that this 'identity' is achieved with Lynch's 'singleness' and identifiability. This returns to the idea of recognisable order, including rhythm and repetition. He goes on to explain that the inside of the house, the enclosed space, is the 'dwelling'. This implies that the outside belongs to the collective identity. Therefore the interior of a house may be unique but the exterior belongs to the collective consciousness of 'genus loci'. Norberg-Schulz goes one step further than Lynch and states that this understanding of place is a 'need'. Just in case we miss the point Norberg-Schulz explains that what he means by character is “*an unmistakable totality.. where each single part has a relevant function within the whole*”. Character therefore is derived from “*qualities which depend on plastic modelling, proportion, rhythm, scale, dimension, material texture and colour*” p432 Norberg-Schulz therefore supports the use of rhythm and repetition to establish a sense of the character of place, which gives a sense of “being” which is an essential need, without which the human feels 'insecure' and without 'foothold' “*amidst unknown surroundings*” (p431).

Pallasmaa (1996) argues that all the senses are important in our perception of design. He also argues that our understanding of the world is based on “recognised” places which become “*the incarnate memory of our body*” it follows that bland and unrecognisable, or monotonous spaces are not remembered or carried with us, and therefore are not part of our identity. It is important that we have places for identity, as according to Pallasmaa this is the “*timeless task of architecture.*” As a point Libeskind (2004) may argue that the dominance of the right angle is misplaced, but he would be the first to argue that the angle that is chosen should be meaningful.

Rhythm and Repetition in Architectural Precedent

Certainly modernism was not afraid of repetition. They valued it, as the origins of Modernism were often very close to a stripped Classicism. Certainly this was the case in Scandinavia and North America.

Arne Jacobsen by 1930 has shifted to a more subtle form of Modernism, that informed the Danish tradition and influenced many Australian architects, especially with the arrival of Utzon to build the Opera House.

Jacobsen in the seaside town of Bella Vista created a series of houses that repeat. They are surprisingly fresh still as they go to some lengths to conceal the garages. Figure 2



Figure 2 Arne Jacobsen, Bellavista 1930 A house from a row of identical blond brick houses.

Utzon and Norberg-Schulz share common cultural heritage and are acquainted. They have a similar approach to the understanding of dwelling. Utzon favours repetition in his multi unit housing. First he designed Kingo houses a whole housing estate in 1960 minimising the impact of housing on the landscape, providing both refuge and prospect. Figure 3 He then further developed this language at Fedensborgin 1963 Figure 4. This is most interesting as this development backs onto a more Anglo-Saxon suburbia. It is also within walking distance of the Queen's summer palace. In *Utzon and the New tradition* they write that “*even though the simple house type is repeated there is no sense of monotony*” as “*the staggering of the wall creates an almost sculptural sensation*” (p62)



Figure 3 Utzon 1960 Kingo housing Source Utzon and the New Tradition 2004:64



Figure 4 Utzon 1963 Fredensborg housing Source Utzon and the New Tradition 2004:68

Utzon's 1969 *Expansiva* was a prefabricated modular house designed for mass production. In Figure 5 it can be seen the rhythm of the repeating module is the most striking feature.



Figure 5 View from street Utzon's 'Expansiva' 1969 at Hellebaek Source Utzon and the New Tradition 2004:177

Sverre Fehn is a notable academic and has constructed some remarkable and original buildings. For his competition winning project in Norrköping Sweden in 1991 he designed repeating straw bale courtyard houses arranged in a line with barrel vaulted roofs.

In 1989 Kairamo designed a dual occupancy residence for the residential suburb of Espoo Westend in Finland. The two houses are not totally identical but they are a mirror repeat in elevation. The suburb is a mix of more traditional Finnish houses and modern. In this locality they are all single houses. However, these houses are “modern” and quite obviously express that there are two of them on one site. Figure 6



Figure 6 Source An Architectural present 7 Approaches:1990 29

Continuing the Modernist tradition, Valjakka designed a housing development in 1985 that sensitively stacks the houses to leave the majority of the site for the natural landscape. The housing is arranged in to an A BBB C rhythm where 'A' is a grouping of four repeating units to balance the bulk of 'C'. Figure 7. This development dominates a street in Jyväskylä, the town where many of Alvar Aalto's early buildings are located



Figure 7 Eero Valjakka, 1995, housing Jyväskylä showing repetition in composition. Source Poole 151

The Danish firm Vankunsten have developed a international reputation for their remarkable use of materials and dynamic housing models. They were invited to design a quarter in Sweden at Hestra Parkstad in 1992. They told me they chose to make the landscape evident with identical 'fingers' cutting across the contours. Figure 8 shows the plan and two of the repeating dwellings. The repetition allows unification of the buildings that in turn places emphasis on the landscape/building relationship rather than the relationship between the buildings.

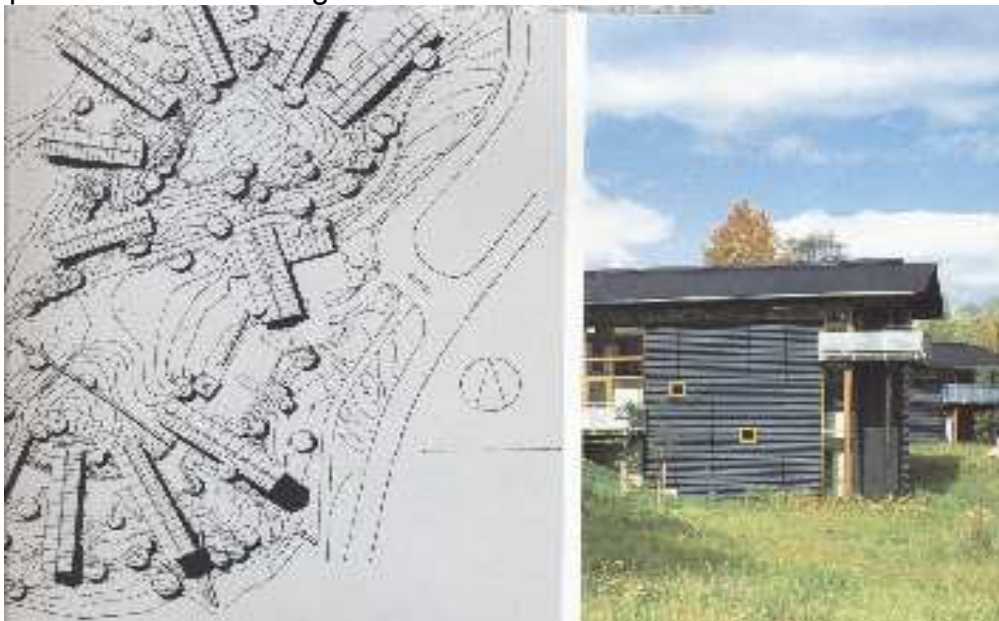


Figure 8 Vankunsten with radial repetition at 1992 Hestra Parkstad, Sweden. Source Vankunsten Igennem 25 ar 1994.

The international housing development that demonstrates the latest European thinking regarding town planning is at Egebjerggaard in Denmark constructed in 1996. They involved citizens and future residents and the fundamental planning aim that emerged was to provide quarters with recognizable and distinctive identity. The result was quarters of

identical or similar houses along streets designed by internationally recognised architects., the idea for recognizable places seems to come from deeply held consensus as there is no evidence of direct inspiration by Norberg-Schulz. It is not that they do not value individuality, rather that they value harmony more. Figure 9 and Figure 10



Figure 9 View of houses from common area Egebjerggaard, Denmark Source Bo i By exhibition catalogue 1996:11



Figure 10 View of houses from street in Egebjerggaard, Tegnestuen Vandkunsten Denmark Source Bo i By exhibition catalogue 1996:44

Local precedent

Maitland and Stafford when compiling their guide to architecture in Newcastle in 1997 only listed three multi dwelling residential developments. The Von Bertoch galleries are made up of four repeating terraces from 1870, The 'set' of dwellings called Boatmans Row from 1893. It is to be noted that it is a *modern* valuation that is made when Maitland and Stafford write, "the sixteen houses present a remarkably consistent character to Nobbys Rd with a pair of decorative gables marking their centre" (p90). An examination of Figure 11 shows they mean they are repeating units with the same materials to the facade.



Figure 11 Boatmans Row Newcastle 1893 Figure Maitland and Stafford 1997: 90

Maitland and Stafford are of the opinion that repetition may produce a positive effect. They write of the four identical houses designed by Frederick Menkins in 1904 that “the effect of this decorative Queen Anne front is greatly heightened by its fourfold repetition.”(p102) See Figure 12. This statement is a value judgement about the benefits of repetition to create streetscape.



Figure 12 The Boltons Menkins designed repeated identical houses Figure Maitland and Stafford 1997: 102

Figure 13 below shows a repeating form that caught the eye of the photographer. The house to the right is identical to the two houses in the foreground. The bullnose veranda is repeated to finish the group of houses neatly in the foreground. They form a neat 'A','A','B' composition with the 'A' form repeating on the opposite side of the street. This was no doubt unintentional.



Figure 13 West Wallsend 1906. Source: Barney 1992:52

Hall, who generally produces “one-off” designs with striking originality, with Collins in 1978 produced an estate of houses for Air Niugini. These houses are responsive to the climate, however, they are repeated to form a streetscape of repeating forms. See Figure 14. One series of houses uses repetition in a A BC BC BC B-D rhythm, where B and C are mirrored.



Figure 14 Repetition to form streetscape Russell Hall's Development for Air Niugini. Figure Australian Architects 5:73



Figure 15 Repetition to form streetscape Rex Addison's Development at Kambah, Canberra. Figure Australian Architects 5:30

In 1987 Addison won the C.S Daley medal for his multi-house development at Kambah Canberra. This development uses repetition to achieve an overall rhythm and order to the streetscape. Figure 15.

In 1995 Rosetti's repeating dwellings were featured on the cover of Architecture Australia, and won the Robyn Boyd Award for Housing, which is a high honour. They are precisely identical and in repetition form an 'AAAAAA' pattern, which Rasmussen points out is the simplest. This can be seen in Figure 16.



Figure 16 Craig Rosetti, Richmond dwellings. 1995. Architecture Australia 1995:44

Dual occupancy by architects tends to use symmetry or in fact perfect repetition. One of the few dual occupancies featured in *RAIA Houses* are called “twin” as the two houses by McKay located overlooking Pittwater are identical and mirror image Figure 17.



Figure 17 Douglas McKay Dual Occupancy Pittwater uses repetition and symmetry. Houses 24, 2001:38

Repetition has been shown, so far, to be a device to gain rhythm and unity and order in a development or streetscape. Repetition has the effect of making the building less evident in the landscape. To gain a sense of what is deemed current best practice in Australia, the Residential Flat Design Code can be consulted. In the section on Building Form and Facades, they emphasize that facades are the external face of the buildings to the public realm. Better design practice says “compose facades with an appropriate scale, rhythm and proportion”. In the three examples of precedent number 03.48 has a caption that reads, “this elevation uses a variety of repeated forms and a restrained material palette” (p89).

Discussion

Wakely in *Dream Home* comments that Seaside in Florida, despite differences individual house design, has a “sameness”, because the architects adhere to strict guidelines (Wakely, 2003: 57). This raises the issue of what constitutes the perception of 'sameness'. In this case there is no repetition but the sum total of the perception of the rhythm is one of monotony. This parallels Henry Lawson's descriptions of 'the bush' as 'monotonous'². For no two Eucalypt trees are the same, but evenly located in a mass they give the impression of monotony. This could explain the architect's negative reaction to suburbia, for despite the individual differences in houses, the uninterrupted repetition of similar scale across a suburb gives a sense of monotony. The very fact that no two are the same means the suburb pattern is one of a homogeneity of *difference*. If all the houses are different but with a similar scale, then they have the same effect *collectively*, as if they are all precisely the same.

2 Particularly “The Drovers Wife” 1892, though this motif re-occurs in other stories.

Conclusion

Aesthetics are agreed to be subjective. They are so subjective some do not think they are important at all. However, to those whom aesthetics are important, rhythm and repetition is agreed to be an important aspect of order. Even those who argue for complexity agree that order is required. It is also suggested that an architect is expressing their convictions or *belief* in built form. Therefore no form should be arbitrary or contribute to chaos.

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