

# An architectural paradigm

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The history of the origins of life is a fruitful field for theory. Some propose a process of intelligent design (ID), such as Phillip Johnson, Stephen Meyer, William Dembski and Michael Behe. In general, ID proponents focus on the co-dependence of operational and functional aspects, of which an example is Behe's analysis of the *E. coli* "motor". To an architect, utilitarian function is important, but an object's form, or shape, is often more important. At the start of the process of creation for architects and product designers, possible forms and functions are defined in what could be called a dialogue shaped by the designer's will and intent. That humans engage in this dialogue regarding new creations in the man-made world opens possibilities for how creation in the natural world can be understood. This paper builds on a previous paper, *The Design Paradigm*,<sup>1</sup> and proposes that the consideration of the role of intent, or will, evident in how architects conceive novel functioning objects can enrich our understanding of the origin of life on Earth.

A paradigm is a simplified, easily understood formal picture that recognizes the important characteristics of a situation or thing. To explain the complex process of how novel objects shaped by the extraordinary application of intellect arise in architecture in Western culture they are characterized as creations in a paradigm informed by the Bible's account of creation in Genesis.<sup>2</sup> A survey of recent architectural magazines found that when describing the inventive work of exemplar architects they often used "creation", whereas work was rarely spoken of as "evolving".<sup>3</sup> Robert Venturi and Ken Yeang, who do speak of design evolution, produce architecture so intellectually dense in its conception that their work tends to support the ideal of novel architecture being a wilful creation by unique intelligence. The architectural creation paradigm is a way of viewing the natural world.

## Design as mathematical logic or irreducible complexity

Intelligent Design proponents, in an attempt to remain scientific, favour arguments for intelligence based on process outcomes and function.

Even creationist scientists tend to favour mechanistic arguments. In 2001 Herrmann proposed that an argument for intelligent design was probability and logical process.<sup>4</sup> Herrmann also rightly points out that a scientific observation is based on the individual's choice in their interpretation of what they see. But Herrmann is not a practicing designer. In 2002 Bergman discussed the many functions of tears in humans, refuting the argument that tear production organs were vestigial. Bergman also went on to put forward evidence that emotional tears had a function in lowering stress.<sup>5</sup> Sarfati and Matthews in *Refuting Evolution 2* also defended bad design in creation in functional terms. They also asked a question, "Do we have all the information/knowledge on the issue?"<sup>6</sup> To a practicing designer they left out one relevant bit of information; the designer's intention regarding possible form.

To focus on function may miss an opportunity for understanding observed reality. To a practicing designer

there is Vitruvius' *venustas*<sup>7</sup> translated as beauty or delight, which needs no further justification, in evoking emotion.<sup>8</sup> However, superimposed mechanistic explanations that came from the historical analogy of the clockwork universe still dominate science. In modern terms, the universe is seen as a machine or a computer. The science that is most useful to humans, however, is increasingly about living things, such as the research on the human genome. The focus on function led Bergman in 2003 to virtually apologize for observed "poor design" by arguing that there was an underlying functional need for poorly adapted species, or failing this, that it was due to God's curse.<sup>9</sup>

As observed through the paradigm of architecture, there need be no apology for what may be called poor design from another viewpoint. That some animals will only eat one type of food, or that animals don't avoid their predators, may have an explanation that has nothing to do with their life functions, such as re-production. The following will present evidence for an argument that the Creator may have with careful thought chosen which functions were more important, and, in addition, may have cared about the form of creation.

## The created human-made world as an exemplar

The observed reality of the world we live in has many human-designed objects that are logical and functional, but it also contains delightful, but illogical, objects and creations that do not function very well at all. For example, the illogical Philippe Starck gold citrus juicer has a high status value. Every human-made object on the planet has a designer, or a creator. Every designer and maker put thought and their intentions, to a greater or lesser degree, into the design of a given object.

Analysis of a found object yields limited information. The ABC show "The Collectors" asks people to identify an object, often less than 200 years old, every episode.<sup>10</sup> Just how little can be understood by merely examining an object is demonstrated in that very few of the people asked can guess the function of an object. From the object they can only guess what the designer's intent might

have been in creating the object. However, in many cases designers have explained the intent behind their creation. There is a large body of literature explaining the history and design thinking of both great and ordinary architects and designers. In the body of information there is an unexpected emphasis, not on function as could be expected but on a concept called form.

### The concepts of form and function

The idea that form follows function comes from a simplification of Louis Sullivan, a very famous American architect's discussion of the ideas behind his new tall office buildings in Chicago. The article that encapsulates his ideas and that became the inspiration for architects following Sullivan, was published in 1896.

"It is the pervading law of all things organic and inorganic, of all things physical and metaphysical ... That the life is recognizable in its expression, that form ever follows function. This is the law."<sup>11</sup>

Sullivan's article came at a time when designers found that the Greco-Roman inspired classical form, in its codified proportions, did not suit best a 10-storey office block, or indeed to encase the huge volumes that industry was requiring. The tenor of the article was a need for designers to make tall, and what could be oppressive buildings, have a beautiful form, or, as Sullivan put it, have a "quantity of sentiment".<sup>12</sup>

The idea that form follows function sparked discussion that has lasted over a century. To architects, the discussion has a significance which is very hard to convey to non-designers.<sup>13</sup> After practicing as an architect for 40 years, in 1971 Arne Jacobsen said,

"It has been said for many years that when a thing is practical and functional, it is beautiful as well. That I don't believe, because there are different ways of solving a problem functionally—without ever managing to make it beautiful!"<sup>14</sup>

The functions for any building are an impossibly long list including voluminous codes (see figure 1). Every one of those functions involves possible conflicts. Utilitarian functions may often be in conflict. For example, the optimal location for enclosed car parking, in terms of access, may not be optimal for achieving breeze to the living areas. The desire for view requiring large areas of glass is often

in conflict with the requirements for thermal comfort. In addition, a list of required functions may be agreed, but individuals will value issues differently. For this reason, the design process features dialogue. Utilitarian functions in the design process, even if well defined, are a set of negotiated decisions made in the context of the totality of perceived issues that maximize perceived benefits while minimizing perceived detrimental outcomes.

Form refers to the shape of the physical reality of a thing, or the width, depth and height including the configuration of the material used. If utilitarian functions, even for a simple house, are negotiable, the detail of the physical form is far more subject to wilful intent. One set of utilitarian functions given to a group will result in the creation of as many visually diverse forms as there are design teams. New, often unexpected, objects are emerging on earth in the man-made world due to acts of creation.

In the following I will examine random examples of what architects say about their creative process to discover common elements of the creation paradigm.

### Architects on creation

The work of Jean Prouve (1901–1984) is admired by many architects for its structural innovation, individuality and emotion.<sup>15</sup> Prouve said, "my smith's workshop and my factory were places where I created" and it is "the manual experience which provides inspiration". For him buildings were a team project, requiring an "osmosis of mind and hand which is difficult when men are separated", as "all objects apart from buildings are made by a single organism", where "true art is the expression of the pleasure one feels while working".<sup>16</sup> Prouve's output in collaboration was always rational and technically brilliant, with each element often serving multiple utilitarian functions, but the forms were visually original, with no two designs alike. The remarkable variation came about as Prove had emotional pleasure in making, a peculiar characteristic of human creation.

Jorgen Bo (1919–1999) and Vilhelm Wohlert (1920–2007) gave an insight into their creative process of their extension to the famous Louisiana art museum in Humlebæk (near Copenhagen).

"There were two essential problems to deal with namely—how to combine the old house with a new building ... and how the building should be placed

Budget, societal expectations, thermal comfort, using locally available materials (due to globalization may now include items from Italy and China) which have standard sizes, structural requirements, energy use, appliances, views, overlooking, overshadowing, breezes, site slope, drainage, sewage disposal, water supply, access, carparking, privacy, noise attenuation, ventilation, compliance with local government regulation, height limits, setbacks, height of retaining walls, national building codes and national/international standards, embodied energy use, preservation of site trees, bushfire regulation, minimizing building waste, construction sequence ...

**Figure 1.** Possible functions for a simple house. This list must be addressed while also solving the complex requirements related to family activities. A house is not merely a shelter.

so the exceptional qualities of the park were turned to account ... we endeavoured to carry on the homey atmosphere emanating from the old house."<sup>17</sup>

They visualized the museum as a long glazed corridor that framed the landscape. Jorgen Bo explained how the long corridor became a zig-zag,

"... wonderful solitary trees appeared as the felling proceeded and one was this beech with nine stems. It is obvious that we had to go around it and you will quickly see that this giving way to the trees very quickly led us to work with a quite natural dialogue between the products of nature and art."<sup>18</sup>

These thoughts shaped this building. They also changed the idea of what a museum is, as this building became influential. The preservation of the tree, because they thought it was wonderful, and the idea that the building be 'homey' is the expression of the designer's value system and their emotional response.

Arne Jacobsen (1902–1971) noted his National Bank building designs (figure 2) were to be "practical and functional", but he said of his creative process,

"the primary factor is proportional ... Next comes the material...to start with a small sketch and see the whole and the details become reality ... it is the actual creative activity"<sup>19</sup>

The idea of harmonious proportions between parts is linked to Jacobsen's perception of beauty, which he places above all else as his primary creative objective.

For Jacobsen's contemporary, Alvar Aalto (1898–1976), creation was more complex. In 1947 he wrote,

"... when I have to solve some architectural problem, I am constantly faced with an obstacle difficult to surmount ...[as] planning operates with innumerable elements which often conflict ... technical demands combined with psychological questions ... which cannot be unravelled in a rational or mechanical way ... when I designed Viipuri City Library ... I drew all kinds of fantastic mountain landscapes, with slopes lit by suns ... which gradually gave birth to the main idea of the library ... with various reading and lending areas stepped at different levels."<sup>20</sup>

Aalto firstly designed places for the human experience of emotion and of being connected to nature, which conflicted with logical technical function (in this case, of efficiently stacking shelves).

Daniel Libeskind (1946–) writes copiously about his design process. For the Berlin Jewish Museum, which he called "Between the Lines", he wrote that his design was generated by four ideas,

"The first was the invisible and irrationally connected star [of David] that shines with absent



**Figure 2.** Danish National Bank: an exercise in precision and finesse.

light of individual address [he connected on a map the addresses of people who died]. The second is the cutoff of Act 2 of *Moses and Aaron* [Schoenberg's opera], which culminates with the non musical fulfillment of the word. The third is the ever present dimension of the missing Berliners; the fourth is Walter Benjamin's urban apocalypse along the *one way street*."<sup>21</sup>

These abstract ideas from the culture Libeskind shared with those procuring the building have physical representation in the final form of the building, including the dramatic inaccessible void spaces concretizing his third point.

When I interviewed thirteen architects in Scandinavia in 1996, there was an underlying theme of a desire to create human experience. One architect, who, like Libeskind, referenced human culture, was Juhani Pallasmaa. He said that the set of columns at the entry of the Art Gallery at Rovaniemi (figure 3), were to create a plaza to prevent people from stepping out onto the road, and in addition were

"... symbolism of a cultural institution, a surreal reference to the classical world because Rovaniemi is at the edge of western civilization."<sup>22</sup>

There is no writing on the building to say it means this, but an educated person may recognize the columns as a classical reference. For Pallasmaa creation is about what is experienced and understood by humans using his buildings.

Bahamon collected the sketch designs for 27 houses by architects and wrote about what their designers were thinking in his book *How Architects Conceive Residential Architecture*. Of the Moby Dick house, Espoo, Finland, (figure 4) by the firm Nurmela-Raimoranta-Tasa, Bahamon writes,

"A sinuous skin, which takes its shape from organic forms, more specifically, from Moby Dick's famous white whale, covers its 6135.4 sq/ft. [570 m<sup>2</sup>] surface area. The curves of this animal's colossal body were the inspiration of this





**Figure 3.** The entry to the Rovaniemi Art Museum Finland.

composition. A curved wrapping that surrounds part of the structure culminates, at the forest-façade, in a large roofed terrace, a metaphor for the animal's jaws."<sup>23</sup>

The design's most important features arise from a story understood by both the architects and the occupants and not utilitarian function. RCR Arquitectes in Spain, similarly superimpose their ideas about form. Bahamon writes,

"The demands for the program ... were not particularly strict ... . However the apparent simplicity is in fact a complex exercise in refinement in design and of optimizing construction ... it consists of a box with fine walls and large windows ... the box lies on concrete walls that act as foundations and at the same time house the semi-subterranean garage."<sup>24</sup>

The idea that the house has the form of a perfect box (figure 4) dominated the functional arrangement, where the garage was so inconvenient they excavated the flat site and buried it. Both examples show the dominance of the architect's initial creative will in determining which functions are more important, which, in debates about the origins of life, intelligent design (ID) proponents, by leaving out the identity of the intelligence, may fail to address.

### Emotional creation

The architects who have been featured all argue that creation comes from feeling, sensation and emotion, or understanding of human culture. They actively create spaces that elicit emotional response. Norman, a cognitive scientist writing about product design, noted in 1979 that emotion was an issue not dealt well with in cognitive science. After years of research and working with product designers,

Norman explains what they are doing in his book *Emotional Design*. He now points out that emotion cannot be separated from cognition. He learnt this after criticism from designers and after new evidence suggests that objects thought of as beautiful are perceived to work better.<sup>25</sup>

Architects, or practicing designers, who design complex functioning objects, may contribute to understanding biblical creation. Lawson after both being a design practitioner and studying design theory for four decades writes,

"There seems to be a certain kind of knowledge and understanding that is very hard to attain in any other way than by actually designing seriously."<sup>26</sup>

Lawson criticized the problem-solution model of design by pointing out that it is a "rather special activity" as problems and architect's creative solutions,

"... do not map onto each other in any logical, predictable or generally understandable way ... the problem-solution relationship in design ... is simply not there. In good design we can seldom de-compose the solution ... the overall pattern and shape beautifully and simultaneously manages to solve all the problems pretty well ... it is not a matter of optimizing but of 'satisficing', or getting everything good enough."<sup>27</sup>

Skilled architects may solve multiple utilitarian functions in a way that is akin to irreducibly complex systems in nature. But it is to be noted that even the best that humans can achieve is only solving all the perceived problems "pretty well", or being "good enough". Jacobsen, one of Denmark's top designers, at the peak of his career said, "To get a thing ... where one can say, 'There, now it's good', that's very difficult to achieve."<sup>19</sup>

A good design satisfies required functions but does not perfectly meet all possible functions. This may be an object lesson as nature occupies the same three dimensional space as human-made objects and is made from materials that are on earth.

Human ideals of perfection akin to infinity are absent from the Bible. Mature designers who are conscious their design has attained a pleasing irreducible complexity may judge their work once built as good or good enough. In keeping with this, God's creation is very good,

"And God saw every thing that He had made, and, behold, it was very good. And the evening and the morning were the sixth day" (Genesis 1:31).

Hebrew has a word close to the English idea of perfect, in the word *tâmiym*. It is used of Noah.<sup>28</sup> Noah's life was complete, full and perfect, whereas creation was very good. Strong's scholars define the Hebrew word for good, *tob*, as "fair, joyful, sweet, pleasant, fine, gracious, precious and beautiful". The word used for creation described the emotion elicited, not its perfection. The idea that creation is perfect can be traced to pagan Greek thinking and is not of Hebrew origin. The following expresses this understanding,

“Pythagoras (500 BC)—put forward the idea that the earth was round, but not on the basis of observation; rather he, like many ancient philosophers, believed that a sphere was the perfect shape and the gods would have therefore created the Earth in this form.”<sup>29</sup>

That nature does not meet these human ideals of perfect does not indicate the absence of God. It merely proves the falseness of the pagan Pythagorean gods and ideals.

We have no way of measuring the making of life, as it is not occurring now. Humans are making new creations in processes which scientists can observe, and these may provide a rich source of understanding of the historic creation of life. Those acknowledged by their creative peers as exemplars have often expressed awe of creation in nature as a result of their observation. Designers using nature as a design source are often seen as more creative by their peers and produce artifacts that may be more desirable to humans than those who do not.

### The Creator on His design

Incidental detail in the Bible indicates a reliable provenance for the account of creation. According to the list of genealogies, Noah was born 112 years after Adam died. Methuselah could have known Adam, Noah and Shem. Shem was still alive during the time of Abraham, as they died approximately at the same time. According to Genesis, information was obtained from a book (Hebrew סֵפֶר, *sepher*) or writing.<sup>30</sup> If the writing quoted in Genesis dated to Abraham, the account of creation need only have been fourth hand. In any case, the account of creation in the Bible is a historical document with excellent credentials.

The Bible’s account of creation demonstrates a pattern found in architects’ explanation of their creation. The first statement of creation intent is, “And God said, ‘let there be light’” (Genesis 1:3).

The word “dialogue” is used often by architects. This process has been well documented by Schon using case studies of designers at work. In speaking of one designer’s process Schon observes,

“He says in effect ‘Let it be the case that X ...’ and shapes the situation so that X becomes true ... it is a game with the situation in which he seeks to make the situation conform to his hypothesis but remains open to the possibility it will not.”<sup>31</sup>

Schon, concludes that for the expert designer the process as a “reflective conversation”, where after each move the situation reveals new possibilities. Lawson confirms the role of language in design noting that experienced designers have in their mind “schemata to which are attached symbolic descriptions”.<sup>32</sup>

In the Bible’s account of creation, after the work is done it is recorded “And God saw the light as good”, God then called the light “day”. Schon notes that: “... when a [design] practitioner sees a problem, he chooses and names the things he will notice.”<sup>33</sup>

In Genesis each act is verbalized as a “move” and then is examined after it is complete, before being pronounced good. Sometimes a move is named before being pronounced good and sometimes it is pronounced good and then named. The reason why expert architects and designers name the things that are to be addressed and then frame<sup>34</sup> the context in which they address them is that

“... problems of real word practice do not present themselves to practitioners as well formed structures. Indeed, they tend not to present themselves as problems at all but as messy indeterminate situations.”<sup>35</sup>

This was confirmed in research by Lang.<sup>36</sup> It was in just such a way that the world presented itself to the Creator. It is written that before the creating was begun that, “And the earth was without form, and void; and darkness was upon the face of the deep.”

The Hebrew word for “without form” is *tohu*, and also means confusion. In other words the world presented as formless, messy and dark. In the same way, messy indeterminate situations are the beginning of design for a creative architect. Chapter one of Genesis is consistent as an authentic account of a truly creative design process where a creative move, or intent, is made in a formless situation, named and reflection in action occurs, as requirements related to the intent are tested. Schon points out that routine non-creative actions are knowing-in-action and don’t involve reflection.<sup>37</sup> The simple account of creation has very few words, yet, the repetition of “let us” and the observation that what was seen as good, are not mere repetitions, but the trace of a creative design process.

In the early stages of the creative process in Genesis the things noticed (or framed) and named are large scale and don’t require an explanation as to the intent of the design move. On day four there is some comment as to what is in the mind of God regarding the placement of the sun and moon,



Figure 4. Sketches of the “whale” house (left) and the “box” house.

“And to rule over the day and over the night, and to divide the light from the darkness: and God saw that it was good” (Genesis 1:18).

The word translated “rule” (Hebrew *mashal*) is a good translation and means “to have power”. The design of the sun and moon satisfies a desire that God has to express an idea God has about the way things should be. God wants light, in His design, to rule over darkness. The design is not mere function. It isn’t about making light for plants to grow. God wants to convey a meaning. It is about creating an experience for intelligent life, not just about creating a mechanical solution to a functional problem.

Scientific observation of teams of designers at work creating, show that they value creating experiences, and that their design process includes anecdotes about experience.<sup>38</sup> As Schon pointed out in his ground breaking research of the 1980’s, technical rationality could not explain the experimental or creative work of an experienced architect (or any innovative professional).<sup>39</sup>

There was more on God’s mind than mere function when living things were blessed to multiply, as on day 6, humans were given dominion or rule<sup>40</sup> over all living things. The set up of this design frame is counter intuitive in terms of pure logical function. If the animals are to multiply, they are going to cause problems for humans. From God’s perspective it is “designed in” that humans need to put effort into controlling the multiplication of living things. The account doesn’t say why God was thinking this way, only that this was the design frame. It may be thought bad design, but it is God’s architectural creation of an experience for human life. It may be argued that it teaches us that we need to have dominion over both nature and our human nature.

At the start of a creative design process the designer observes confusion and formlessness. In the middle there is intense and all absorbing thought and action. At the end, when a new “order” is arranged in a form that has been made from mess or formlessness, there is an immense satisfaction, euphoria and an indefinable feeling of having nothing to do. The Bible account of creation is amazing in that it captures this experience in a few words.

“And God blessed the seventh day, and sanctified it: because that in it He had rested from all His work which God created and made” (Genesis 2:3).

### God speaking about God’s creation

The Bible does not speak much of natural creation beyond the account in Genesis, focusing more on the human condition and the fate of nations. However, in the book of Job, God speaks about his creation of the natural world. Job and his friends’ dialogue was, in substance, about the reason for Job’s affliction, which they tried to understand using observation. God then answers Job and his friends and points out his sovereignty and the role of his creative will in nature. It is too lengthy to quote, but some examples are enough.

“Who has sent out the wild ass free? or who has loosed the bands of the wild ass? Whose house I have made the wilderness, and the barren land his dwellings” (Job 39:5–6).

The implication is that it was God who made the wild ass and designed it for its habitat.

“The goodly wings unto the peacocks? or wings and feathers unto the ostrich? Which leaves her eggs in the earth, and warms them in dust. She is hardened against her young ones, as though they were not hers: her labour is in vain without fear; Because God has deprived her of wisdom, neither has he imparted to her understanding” (Job 39:13–17).

“Does the hawk fly by your wisdom, and stretch her wings toward the south? Doth the eagle mount up at your command, and make her nest on high?” (Job 39:26–27).

In other words, the way the world exists is due to the fact that God made design decisions. In this case, the specific decisions that the ostrich will bury their young in sand and that the hawk would nest in rocks. No further reason is given. Yet both birds in our culture are lessons: the head buried in the sand avoiding unpleasantness, and the farsightedness of the eagle. The implication is that the function of reproduction was not as important as the lesson for humans in the form chosen for the birds.

The two animals spoken of last in Job seem the most special: Behemoth and Leviathan. The clue to the thinking regarding these beasts is in the introduction to them,

“Deck yourself now with majesty and excellency; and array yourself with glory and beauty. Cast abroad the rage of your wrath: and behold every one that is proud, and abase him” (Job 40:10–11).

These two are mighty animals that far exceed human strength and even the strong and mighty cannot tame them. In creating the majesty of their strength, God was demonstrating his power by forcing humans to feel humble in the presence of the power of the beasts he had made. But the strength of their form was for glory and beauty, not merely function.

### Conclusion

How we view the world will determine what “frame” we make to understand what we observe. Creation was a historical event, however, though limited in scope, humans are carrying out currently observable creative acts and writing about them. These texts emphasize, not function, but beautiful meaningful form and the will of the Creator. These two elements feature strongly also in the Bible text where God speaks of His creation. There may be a place for the ID proponent’s analysis which concentrates on function, but observations of human-made creation suggest a wider



frame of reference from which to draw conclusions about the origins of life.

That the world is created for beauty and emotion may better fit scientific observations of the natural world, than that it was created to function to some human ideal of “perfect”. In addition, the science of human cognition is finding emerging evidence that humans value beauty and emotion. If this is the case, the idea that life is created is also more useful as a paradigm for human life than evolution, which struggles to explain the origin of emotion.

Despite 200 years of evolutionary thinking, scientific ideas of machine-like rationalism and logical function, there is evidence that architects still believe they are creating a beautiful, meaningful world for emotional humans. It seems absurd from the viewpoint of this architectural paradigm that the often weird, curious and oddball beauty of the natural world was not the result of the work of a Creator more individual and wilful than the most creative architects who have lived. It is possible that if we learn to create and then observe the natural world as a creation, we may then see into the mind of God.

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