

The Investigation of Organic Design Style -Take Design Elements of Ross Lovegrove as an Example-

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Abstract

The research is mainly discussing the substance of organic design style, not only including the design history but also understanding how it turned out to be a product. This research uses Literature Reviews in advance to investigate the beginning and the features of organic design style. Second, using Morphological Analysis in “captain organic”, Ross Lovegrove, has the twelve masterpieces to conclude the design factors by the concepts, color and texture. And finally, use the Three-Dimensional Structure as the basic of Checklist Method, and find out what the substance of design style Ross Lovegrove’s claim really is. The conclusion could be organized to the following two aspects:

- I. The history of organic design style could be divided into five parts: (1) Begin in the end of 20 century and provided by American architect Frank Lloyd Wright. (2)Used in products design in the 1930s. (3) Appear the numerous organic design motifs in 1945s. (4)Disappear in the 1960s caused by World War 2. (5)Flourish again in the 1990s for the high-tech.
- II. Ross Lovegrove’s seats have three features: (1) Put emphasis on making perfect organic line and fantastic sense of rhythm. (2)Use the silver and black colors which symbolize the future. (3) Used different materials which show the designer’s creative ideas.

Key words: Organic design, Design style, Ross Lovegrove

I. Preface

Living creatures took hundreds of millions of years to evolve to the states we saw today, how it condense this long period of times to produce such a magnificent design? The renowned designer Ross Lovegrove once expounded his viewpoint with an angle of macroscopic about the organic design. If we dated back to the very beginning, organic means the origin of the life, and there are far too many beauty in the Mother Nature which is beyond our description, 'organic design' is the tool used to transform it into the elements of things in daily life, by using the most primitive yet most simple things for us human to appreciate.

Organic design is the most unique design style that had cease to active for some time, but emerged again (Lakshmi Bhaskaran, 2008), In recent years, numerous design use this style as its core creation, but none of them dedicate their efforts explicitly in probing historical rise and down, as well as its real characteristics and design principle; so the situation became obscured when compare with 'the Bio-ecologism'.

Based on research background and motive listed above, these research drafts two purposes as following:

- (1)Collect through the literature and reference materials, explore into the historical development and characteristics of organic design style.
- (2) Utilizing morphological analysis to analyze the elements of the organic design style of Ross Lovegrove, and evaluating his symbolism of design style.

II. Literature Review

2.1 The source and definition of organic design style

The concept of organic design was stemmed from the end of the 19th century, first issued by American architect Frank Lloyd Wright and Charles Renee Mackintosh, they think the furniture should be integrate, both functional and visual, with indoor environment and building itself; In addition, the building should also display a special relationship with the surrounding environment, in term of structure, material or color used, etc. (Lakshmi Bhaskaran, 2008).

This research probes into the origin of the organic design style in Frank Lloyd Wright's viewpoint, and gather its definitions from domestic and international scholar, listed as following:

Table1: The Origin of the Organic

Decade	scholar	Definitions
2002	Cheng Han	Wright emphasizes on Nature as a foundation of the building, and the building itself should have living rhythm of vitality, closely touch the earth and integrated with natural scenery, as it were part of it.
2006	Ruan QingYue	Frank Lloyd Wright's building has a kind of style that genuinely displays himself as an architect of his own personality, he knows how to use the true life of materials that follow demand for the function, reflect the reality of the environment instantly, which shine the aesthetic feeling of reality, and seek individual life to be blend with the universe in a harmonious relationship.
2010	Thomas Hauffe	To Frank Lloyd Wright, a house is a kind of organism growing out itself from nature.

Synthesize the above description, and explore into one of the most famous masterpiece of Wright ' Fallingwater', we had learned about his persistent and annotation in ' organic doctrine ' (Cheng Han, 2002), according to Frank Lloyd Wright's own definition: ' " organic building " is a kind of " natural building", and people, building, nature, human spirit and the universe, etc., all can be combine together in terms of " the essence of the building materials "; The concept of an architecture, building processes and building itself, are dedicate to create an organic wholeness, or the natural wholeness (Ida Luis, 2006) .

To extend its definition of ' organic building ' to its very essence, Frank Lloyd Wright consider the initial concept of organic design is a kind of style closely linked with natural life, it vividly display that life is full of vitality like an organism, and melt within the great environment appropriately, ' that is why organic design often put viewers in realizing the familiar feeling of truth.

2.2 Development of organic design style

Wright emphasize the concept of nature and integration, and display in his masterpiece (for instance: Fallingwater, Guggenheim Art Museum in New York), But the use of the organic shaping was not commonly accepted at that time, until after 1930, the organic doctrine was used in product shape design gradually, and organic, streamlined shape begin to emerge.

Alvar Aalto was one of the founders in organic designs, his insist on using the natural material totally grasp the user's need psychologically and functionally, his opinion of organic design has profound influence on numerous designers such as Mr. and Mrs. Eames (Lakshmi Bhaskaran, 2008).

In 1930, Hitler's doctrine of centralization of state power had invaded into various countries, as well as the rising of modernism in Germany, had forced U.S.A. to become the leader in art, building and design.

Modern Art Museum of New York was established in 1929, it had held ' the organic design competition of the household articles ' in 1940, its purpose was to forge the furniture's new shaping design. From there Charles Eames and Eero Saarinen design an organic chair that earned many attentions, and have emerged from this match.

Eames, Eero Saarinen and Harry Bertoia were the representative figure of ' new organic styles.' They begin producing their furniture after 1945, which is made of poly-fiber, aluminum, and laminated wood-board, but because of the wars that had caused a devastated shortage of materials, their furniture then crumbled to an end. However, since Mr. and Mrs. Eames have developed a new technique in timber and polyester material for US Navy after the war, that render the shaping of furniture design into having a soft, streamlines shape (Lakshmi Bhaskaran, 2008).

2.3 The second emergence of modern organic design style

After World War II was finished in 1945, materials shortage had actually causing supply to be less than demand, thereafter; the post-industrialism rises to cause the organic design style of emphasizing the shape began to fade away toward a totally collapse in 1960.

In 1990, the abundant market makes supply greater than demand, if not equal. So people gradually begin to pursue the material and spirit life in parallel, (Jui-Che Tu, 2003), Thus organic design style, which emphasized on the differentiated of society, began to emerges again, that forced London Design Museum to held ' the organic design exhibition ' in 1991. After

1990, the improving technology of brand new manufacturing process, new kind of materials (mostly plastic), and computer-aid design had also foster the resurrection of design style (Lakshmi Bhaskaran, 2008).

Many designers who had highly recommends modern organic design style were Mr. and Mrs. Eames, Eero Saarinen, Jorn Utzon, Pierre Paulin and Ross Lovegrove, as well as those new-eras's designer Mark Newson and Thomas Pedersen (Lakshmi Bhaskaran, 2008). Among numerous organic design styles, this research deals only the renowned designer, Ross Lovegrove, and his techniques relevant to the organic design.

2.4 Ross Lovegrove and modern organic design style

British designer Ross Lovegrove have highly promote organic design in recent years, and describe his own style in 'The organic essentialism,' he has integrate his products with human engineering, sculpture-like shaping, and used the state-of-the-art Hi-Tech, brand new materials and manufacture procedures, to produce a lot of classical creations, including shoot magnesium alloy ' Go Chair,' and utilize the high pressure technique to forge mineral water bottle for TN Nation, use digital-aid technology to mold scripture-like seat know as ' Supernatural ' ,etc. (Lakshmi Bhaskaran,2008) .

Ross Lovegrove will do a lots of investigation and understanding of the materials he use before his design, and transform the abstract concept into a solid body, then extend a profound meaning in it, to make it becoming a product with soul.

Ross Lovegrove thinks that if you can perfectly combined the none-living object with the living creatures, while constructing a harmony of sense, then you can create not only a delicacy but also the most attractive product (Lakshmi Bhaskaran, 2008). With an aid of digital technology in design, you can create a round, gentle and graceful contour perceptually just like human figures, this kind of products will display an aesthetic feeling exceptionally (Dig-Insight 40+, 2009).

We can conclude from the facts listed above that Ross Lovegrove did insist on his opinion that organic design is not simply a living creatures imitative shape design, but a much more deeper exploration of new materials and characteristics that show symbol of nature, and the most important thing is to make the two coexist harmoniously.

Through the theories expound in his lectures given in 2005 in TED: we have to crystallize our imagination into the shape in order to upgrading every senses of human being, and respect the truth that we live because we take things from earth, and transform it into commodities. So I think Ross Lovegrove 's organic design is actually an idea that incorporate nature into daily-life ', his method of fulfilling is to combine ' art ' with ' science and technology ', his emphasis on application of new technique, shows the prominent aspiration of mankind toward the mother nature in organic shape design.

Through relevant literature and reference materials collection, we can learn from this research about the source, process, and development of organic design style, discuss its trend and representative figures; summarize the historical evolution of the organic design style and list as Table 2.

Table 2: Historical evolution of the organic design style Evolution

Historical evolution of the organic design style Evolution			
Rea	Incident	Representation	
1890	1890	Wright puts forward the concept of 'organic building' at first, think and design organically for style closely linked with natural life, are full of vitality.	· Frank Lloyd Wright
1930	1890-1930	Appear only in organic design style are now use in product's shape design gradually, thus organic, flowing streamline begin to appear.	· Alvar Aalto
1945	1930-1945	Organic design competition of the household articles held in 1940 had brought up many designers. The development of technology has also help to transform organic design into streamlined shape.	· Charles Eames · Eero Saarinen · Harry Bertioia
1960	1945-1960	After World War II, because the shortage of materials and supply is less than demand, the post-industrialism had raised, that caused organic design style to fade away till 1960 it came to a totally collapse.	(None)
1990	1990-Now	Abundant market demand greater than supply gradually, so people begin to pursue the material life, that make organic design style to emerges again. After 1990, new manufacture procedure, new material (plastics) and the progress in technology and computer-aid design, etc., encouraged the recovery of the organic design style.	· Jorn Utzon · Pierre Paulin · Ross Lovegrove · Mark Newson
2010			

(Summarized by the research)

III. Research Method and Procedure

3.1 Methods and steps

This research mainly uses literature review to explore history and development of organic design style, follow by morphological analysis approach to analysis some of Ross Lovegrove works, and probe into organic elements of design style; lastly, we use attribution and checklist method to examine his shape-designing tactics and elements as a whole.

➤ **Research method:**

(1) Literature Reviews

Through literature reviews and attribution analysis, to understand the trend of organic design style, then probe into its rise and decline, and the status quo of organic design.

(2) Morphological Analysis

Morphological Analysis is a method used to classified various kinds of important parts (independent factor), and systematically analysis the database of every independent part accordingly.

This research intends to make a serial comparison of Ross Lovegrove’s works, in terms of important parts in morphological design, and probe into different aspect in organic design application.

(3) Checklist method

This method utilize checklist along with attribution to examine and form an analytical method. Coordinate with constituted principle forms and method mentioned in “The principle of constituent foundation in 3D design, (Chong-Hong Lin, 2005)”this research use the checklist method to explore Ross Lovegrove’s works in a step by step manner, and summarize the 3D ingredients in his organic design style.

3.2 Research procedure

The research flow chart is shown in Fig. 1

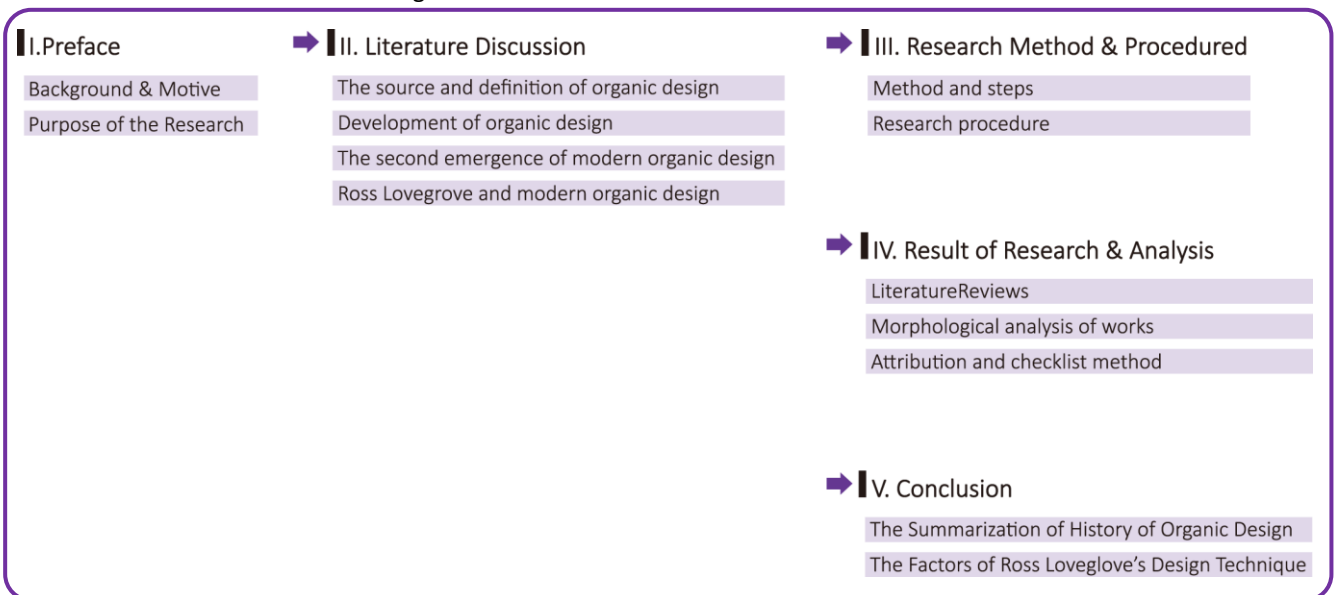


Fig. 1: Research flow chart

3.3 Sampling range of this research




The sampling range of this research is confined to Ross Lovegrove’s works as a case discussion, and will not touch works of other mainstream of organic design style, so as to analyze his works completely, and this research will also sample all the chair’s design mentioned in the book called “Supernatural: The Work of Ross Lovegrove.” take a further step in discussing his influence on organic design style.







IV. Result of Research and Analysis


4.1 Morphological analysis of works

In this part, we will center on the 12 chair's design mentioned in the book called "Supernatural: The Work of Ross Lovegrove." probes into shaping concept, color sense, material of the works, etc., then by using morphological analysis further, to gather together and to understand the difference among his different works, the result is shown Table 3.

Table 3 morphological analysis

<p>Work 1</p> 	<p>attribution and ingrient analysis</p> <table border="1"> <tr> <td>Name</td> <td>Bone Chair</td> </tr> <tr> <td>Age</td> <td>1994</td> </tr> <tr> <td>Shaping concept</td> <td>Have sculpture shape of the rhythmical image, as if light and handy bow on the shaping, with a feeling of hand-work sense of the African tribal culture.</td> </tr> <tr> <td>Color sense</td> <td>Use original color of the timber with a sense of warm.</td> </tr> <tr> <td>Meterial</td> <td>Body : America Sycamore Seatpad: Carbon fibre</td> </tr> </table>	Name	Bone Chair	Age	1994	Shaping concept	Have sculpture shape of the rhythmical image, as if light and handy bow on the shaping, with a feeling of hand-work sense of the African tribal culture.	Color sense	Use original color of the timber with a sense of warm.	Meterial	Body : America Sycamore Seatpad: Carbon fibre
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Work 6		attribution and ingrient analysis	
	Name	Gas Chair	
	Age	1998	
	Shaping concept	This chair in an air-like organic shape, that boring holes on the surface, Material consumption and weight of skeleton are lightened. The chair explore into a brand new organic aesthetics, attempt to reduce complexity while strengthen his plasticity.	
	Color sense	Firefly-yellow, black and white, whereas the most initial edition is firefly-yellow only, make it full of novel, high-profile feels.	
	Meterial	Polyester fiber	
Work 7		attribution and ingrient analysis	
	Name	Go Chair	
	Age	1998~2001	
	Shaping concept	Utilize the concept of injecting gas into single bond polymer, emphasize the natural air will bore holes to make it liberate the shape in the object. Use the smooth lines wholly, design the hole in a utensil with bubble sense and cooperate with the chair basket emptyly, it conforms to the human engineering.	
	Color sense	In white, silvery and iron-grey colors, the metal sense the strong foggy sense of metal makes it having a modern feel.	
	Meterial	Magnesium alloy	
Work 8		attribution and ingrient analysis	
	Name	Oasi Armchair and Footstool	
	Age	1998	
	Shaping concept	Explore the biological shape about the human body in the form of asymmetry. The steel frame cantilever hidden inside of it let out a more outstanding shape, this structure can help mother taking care of her children without wasting any extra efforts.	
	Color sense	White, tangerine, black . The leather's surface is closely tied that realized the sculptures appearance.	
	Meterial	Cotton, leather, steel bone	
Work 9		attribution and ingrient analysis	
	Name	Public Seating	
	Age	2000-2003	
	Shaping concept	It is the outdoor public seat with sense of the sculpture, its main function is to beautify the urban space. The shaping image rises from the plate for one topography, create the seat, back and bench of abstract style.	
	Color sense	Material in various color, and all in shining bright color of the high chroma, quite suitable for the outdoor environment.	
	Meterial	Polyethylene (sturdy and resistance to acid and ultraviolet ray)	
Work 10		attribution and ingrient analysis	
	Name	Aluminium Liquid Bench	
	Age	2002	
	Shaping concept	Potentially uses of liquid form on the long stool , explore into the basic structure liquid-like shape and single material on this bench.	
	Color sense	Silver-plated tone makes it full of sense of modern.	
	Meterial	Metal	
Work 11		attribution and ingrient analysis	
	Name	Brazilia Lounger and Footstool	
	Age	2003	
	Shaping Concept	Elegant image of oceanic wave of rises and falls, the sculpture -like elements has demonstrated the shape of the fluid in the structure.	
	Color sense	White, black, foggy skin improve overall quality.	
	Meterial	Hard polyurethane	

Work 12		attribution and ingredient analysis	
	Name	Orbit Plywood Chair	
	Age	2003	
	Shaping concept	Use the plywood to enhance the structure strength and present the graceful shape of the petal on the shape, apply timber in the middle to create a characteristic of pistil, such design did possess aesthetic feeling, it also conform to the human vertebra.	
	Color sense	The splint of the timber with original color blend with the image that the petal bursts forth, which is full of naturally warm sense.	
	Material	5MM plywood	

(Summarized by the research)

According to this research we have concluded the main points of Ross Lovegrove's design from preliminary morphological analysis among these 12 works, and sum up a lot of similarities and differences, the result is in Table 4 shown as follows:

Table 4 : Main points of Ross Lovegrove's design

Project	Summary	
Shaping concept	<ul style="list-style-type: none"> ➤ Most of the works have demonstrated sculpture-like lines, natural token and biological style, some of them also emphasize human engineering in shape design. ➤ The design on the shaping is divided into the following five kinds: <ul style="list-style-type: none"> • Streamline shape of the sense of the sculpture • The ever-changed form of nature • Biological shape of the nature • Conform with mankind's essential shape • Change of the organic gas 	
		1.Bone Chair, 2.Fractal, 8.Oasi Armchair and Footstool
		9.Public Seating, 10.Aluminium Liquid Bench, 11.Brazilia Lounger
		12.Orbit Plywood Chair
		3.Apollo Rattan Lounger , 4.Spin Chair, 5.Loom Chaise Longue
Color sense	<ul style="list-style-type: none"> ➤ Most works will put forward one classical color in the beginning, then it will cooperate with the trend that match colors with other color. ➤ Most of color cooperate with materials, its difference can be divided into three kinds: <ul style="list-style-type: none"> • Silver, black, and white representing a sense of futureism • Vivid-sensed multi-color in a light-bright series • The earth color with a natural sense 	
		4.Spin Chair, 5.Loom Chaise Longue, 7.Go Chair, 11.Brazilia Lounger, 10.Aluminium Liquid Bench
		2.Fractal, 6.Gas Chair, 8.Oasi Armchair and Footstool
		1.Bone Chair, 3.Apollo Rattan Lounger, 12.Orbit Plywood Chair
Material	<ul style="list-style-type: none"> ➤ Coordinate with the modern science and technology, to develop, by using different materials to make the works full of scientific and technological sense. ➤ The material designed in each and every seat are totally different, it is obvious that Ross Lovegrove dare to challenge the innovation of new material. ➤ Each seat used not more than two kind of composite material, so as to emphasize the characteristics of its material. 	

(Ross Lovegrove, 2004 & summarized by the research)

4.2 Attribution and checklist method

The compositive condition of beauty is to combined perceptual comprehension with rational inference. Extract a principle for us to follow from beautiful experience and feeling, and set up the standard of expression in shaping accordingly (Chong-Hong Lin, 2005).

Through three-dimension composition theory, its forms and its method, as a whole, it can be used as a key element in attribution analysis. This research follow his method, according to "The principle of constituent foundation in 3D design," written by Chong-Hong Lin in 2005, to analyze the similarities and differences in this 12 works, and put forward Ross Lovegrove's composition theory as listed in Table 5, 6 and 7.

Table 5: The principle of constituent foundation

Constituent foundation	Principle
Repetition	With the same image or the composition unit of the color, to arrange regular or irregular repetition.

Gradation	Gradation of color in a repeated form, which is composed of such ingredients as arithmetic progression-like, geometric serial-like, gradation form.
Equilibrium	On a basis of an axle, left and right or up and down are all equal, and will not overweight toward each part.
Rhythm	Form the sensations of movement in a verse, gradation style that can produce the phenomenon of rhythm.
In succession	The constituent elements are in good order arrangement or phenomenon, which makes people to have a kind of stable sense or comfortable vision.
Proportion	Each component and the whole body, all of them possess certain figure or multiple relationships.
Mediation	It makes the inter-reaction of the whole body to keep a kind of intact, harmonious situation that will not conflict from each other.
Tension	Expressed the special emphasis or rival situation with a strong and unique method to constitute the shape.

Table 6: The form of constituent foundation

Constituent foundation	Form
Monomer	Consist of only one basic unit.
Complex	Made up of two basic units, the unit body that can match up different designs.
Block	Molded by a piece of entity that had certain senses of stability.
Space	Constitute a certain degree of distance relationship among elements, can use the element in association with any dot, line, and surface to produce the phenomenon of space.
Geometry	Divided into mould square in mathematics and rational proportions in theory of art.
Freedom	It is of no proportion, form or size; it uses different or same elements to arrange various free-form states. (line material is the best thing in forming the free-form)
Group	It can be used in succession and gradation method to expanded and produce a variety of shape.
Spheroid	Regard round shape as the element of changeable, it must take circumference into factors of consideration, which can be smaller than the round range, break the circumference contour line.
Oblique	In order to become the constituent of the angle, it can be a straight faces oblique angle, curved surface oblique angle ,etc.
Cube	Square body form that can be extended for the sake of space arrangement, measuring sense extension.








Table 7: The method of constituent foundation






Constituent foundation	Method
Superimposition	Deal with the units of two kinds or more than two kinds by way of increasing progressively or decreasing progressively.
Direction	It is one of the conditions to form the dynamic sense, orientating and dividing into three kinds: angle, height and slope itself.
Quantity	Expressed in pieces of material shaping that produce shape, belong to quantity sense of entity.
Dynamics	Also known as rhythm, it will demonstrate a dynamic phenomenon in visual or psychological form.
Dimensions	With the difference in outer shape that makes a sense of different in size.
Space	Create a sense of true space by utilizing the entity and hollow arrangement.
Modulor	Module with arithmetic progression-like, geometric serial-like shape, that can be used as a classical or reference in design.
Disposition	With composition element of more than two kinds, make the arrangement on the position of it.
Axle	It is a kind of linear activity, with one axis for guide mainly, it make the constituent element to act as the continuous disposition along this axis.
Division	To make the partition out of plane elements that constitute the three-dimensionally shape, and break apart the whole form in changing position consecutively or separate alternately.
Intersection	Perform relative permutation or make up alternately based on directionality principle, and constitute a sense of space in terms of three-dimensional shaping.
Emission	Regard a centre as the starting point, develop or make the permutation rotated outward.

(Chong-Hong Lin, 2005 & summarized by the research)

This research center on 12 samples, and concluded his style attribution, as shown in Table 8, in according with 3D constituent elements list in Table 2, 3, and Table 4.

Table 8: The constituent foundation of the works' shape Checklist

Research Sample	Principle		Form		Method	
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
					Intersection	Emission

Research Sample	Principle		Form		Method	
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
				Intersection	Emission	
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
				Intersection	Emission	
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
				Intersection	Emission	
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
				Intersection	Emission	
	Repetition	In succession	Monomer	Complex	Superimposition	Direction
	Gradation	Proportion	Block	Space	Quantity	Dynamics
	Equilibrium	Mediation	Geometry	Freedom	Dimensions	Space
	Rhythm	Tension	Group	Spheroid	Modulor	Disposition
			Oblique	Cube	Axle	Division
				Intersection	Emission	

(Chong-Hong Lin, 2005 & summarized by the research)

This checklist method examines the samples with key elements from literature attribution and narration, and then, through 3D constituent elements of morphological analysis on each work of Ross Lovegrove, we have concluded the following points:

- The principle of 3D constituent elements:
Main element in composition principle are rhythm (11 times), tension (11 times), and equilibrium (9 times). The symmetry in his works which comfort and stabilize the viewer's senses that possess an aesthetic feeling of rhythm and gives shaping vitality and uniqueness concurrently, (Chong-Hong Lin, 2005), thus express the tension of his works instinctively.
- The principle of 3D constituent elements:
Main element in composition principle are space (8 times), and free-form (6 times). It takes appropriate planning in free-form style in order not to result in visual misunderstanding, with a perfect cooperation with stretched smooth lines, we can see, quite obviously, that in the works of Ross Lovegrove, the sense of space that shows virtual reality is simply just right, it accomplishes softness and natural style.
- The principle of 3D constituent elements:
Main element in composition principle are sense of movement (11 times), space (8 times), axial (9 times) and arrangement (5 times). There are close relationships between sensation and movement of rhythm, and this research had discovered that among his works, in respect of constituent elements, the way it is formed are full of senses of movement; With a perfect control over space of virtual reality, plus an appropriate arrangement in axial gradation, it can instantly produce a state of dynamic movement with rhythm and axial gradation with gracefulness.

V. Conclusion

The conclusion of this research can be divided, in respect to research purpose, into two directions correspondingly: firstly, through collection and analysis of correlated literature and reference materials, it can be learned that the historical development of the organic design style is approximately divided into several important period, as following:

- (1) **At the end of the 19th century:** American architect Wright was the first architect who puts forward the concept of 'organic building,' and consider organic designs should be tightly coexist with natural life.
- (2) **In 1930:** The organic design that originally appears only in architectural design, was unprecedently penetrating into the daily-life product design by Alvar Aalto, so the article for daily use begins to appear in a more streamlined and rhymed shape.
- (3) **In 1945:** From 1940, U.S. has gradually became one of the greatest country in design, including Charles Eames, Eero Saarinen, and Harry Bertoia etc., their design have won so many prizes, with the help of science and technology, in design competitions, that it gives organic design a sense of more abundant streamline.
- (4) **In 1960:** World War II had caused devastated shortage in materials, so the post-industrialism have aroused after people had suffered from a life of poverty and hard-work, therefore, the organic design style that emphasizing the shape design has begun to fade away to a totally vanish in 1960.
- (5) **From 1990 till today:** In 1990, abundant market has makes supply greater than demand. Thereafter, ' organic design ' style has emerged again in the rich society, and the progress of technology, in terms of new technique and new material, has promoted its spreading speed of development.

Secondly, after cross-reference of morphological analysis and attribution checklist method, we have learned from Ross Lovegrove over his characteristics and elements in design, so as to enabling we designer to grasp key elements of design in the near future by summarizing organic design style and adding more valuable merits on it. This research sums up the result as follows:

(1) Shaping concept characteristics

Ross Lovegrove has always emphasized on sculpture-like streamline shape and sensational movement of vitality in his design, by using various elements directly from the Mother Nature, and the change of organic gas, so as to conform to the true essence of human life.

His works pays special attention to equilibrium and symmetry simultaneously, while pursuing the free style of organic design, exquisitely displaying its sense of virtual reality in his work ingeniously.

(2) The characteristics of visual sense of color

The visual sense of color in his works can be divided into three categories, silver black, and white, all with vivid bright and natural earth color, what is more is that every color are coordinate with the materials used in each work that shine with a three-dimensional shape of organic design and possesses such characteristics as a masterpiece of nature, rhythm and streamline.

(3) Material characteristics

Through this research we have discovered that no basic material is the same in his works, because Ross Lovegroves had put much emphasis on the ever-changing state of organic design. With the help of modern technology, he innovates constantly in material, and has developed organic design of his style exclusively.

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