The Fractal Characters of Chinese Fengshui Theory

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Abstract
The viewpoint that the Chinese Fengshui is a scholarship of siting for cities, villages, houses, mausoleums and etceteras, analyzing and evaluating landform, environment, rivers, landscape, weather and etceteras, planning and improving sites has been presented in this paper, what’s more it is considered as the unique representations of the Chinese architecture culture and the syntheses of science and superstition, so, it’s unfair to denounce the Chinese Fengshui as superstition. This article introduces the fractal definition to describe the characteristics of fractal and illuminates the perfect patterns of Fengshui terrain and plans of houses and graves according to Chinese ancient books, as well as substantiates that they all have image symbolizing human. The conclusions have been obtained on following:

1. The terrains, houses and tombs in traditional Chinese Fengshui theory all form patterns of “a person” making a bow with hands folded in front. These similar images, adding to the image of a person making a bow with hands folded in front when they meet each other in real life, form a set of human shape with three cascades. In this set, the smaller conformations image the larger or the whole. These irregular shapes can’t be described with language of traditional geometric and have self-similarity, so they possess fractal characters.

2. The differences between these shapes and an exact fractal set are that the reduced cascades are finite and these shapes have some approximations.

3. These shapes symbolizing human in Chinese Fengshui theory reflected enough the ancient Chinese philosophy of ‘regarding human as the fundamentality’ and the humanistic idea of “peace is valuable”.

4. In ancient Chinese Fengshui theory the fractal rudiment had been formed in urban planning and architecture.

Key words: Chinese Fengshui theory; pattern of Fengshui; symbolizing human; fractal; unity of people and nature

1. Introduction
Being particular representations of the Chinese architecture culture, Fengshui is the syntheses of science and superstition. Chatley, an occidental scholar, has pointed out that Fengshui in Chinese culture “is a kind of art harmonizing the location of alive or departed people with the nimbus of the universe” (translated from Chinese).

For a long period, from the view of modern science, Fengshui has been frequently denounced as superstition. But in fact it is unfair to Chinese Fengshui theory. Being against a unilateral understanding of Fengshui, WANG Qi-heng, a Chinese professor, points out the long existence of Fengshui in Chinese architecture must be somewhat reasonable and the “Qi” and “Shui” in Fengshui theory based on long-term practice and consideration have been expressed in a statistical way from a mass of experiences. Professor Wang also points out the consistency between Fengshui theory and the theory of architectural ecology in some sense since the major idea of Fengshui theory looks upon houses as parts of the whole nature and emphasizes the harmony between buildings and environment.

The definitions of Fengshui have been significantly discussed by a number of scholars. In a thesis published in \textit{STUDIES IN THE HISTORY OF NATURAL SCIENCES} (No.1, 1989), YIN Hong-ji writes that Fengshui is the appraising system of landscape looking for auspicious location of buildings. In the preface of the book \textit{In Search of the Genesis of Fengshui}, Professor PAN Gu-xi indicates that: The primary content of Fengshui is the scholarship of choosing and improving residential environment that includes various facets of houses, palaces, temples, mausoleums, villages and cities. The mausoleums are called “Yinzhai” and the houses are called “Yangzhai”.

From the above-mentioned, we consider that Fengshui theory is the scholarship of siting for cities, villages, houses, mausoleums and etceteras, analyzing and evaluating landform, environment, rivers, landscape, weather and etceteras, planning and improving sites. It aspires after the harmony between environment and residences and forecasts good or ill
luck in the future.

On the other hand, as the mathematics that researches the anomalous and desultory phenomena and performances in nature, fractal has been developed by Mandelbrot who summarized the forerunners’ researches and published his epochmaking monograph

Les objets fractals: forme, hazard et dimension. The purpose of science is to know and to describe the external universe; the object of natural science is the whole nature. The category of conventional sciences is based on Hellenic philosophy and mechanism revolution in Europe. The fatal limitations of conventional sciences are their oversimplification and superregularization, while the nature is originally rich and colorful, kaleidoscopic and complicated. From this point, fractal has pioneered a new and wide scientific field.

The word ‘fractal’ was created by Mandelbrot. Before the middle period of 1970’s, Mandelbrot had used the word ‘fractional’ to express his fractal idea. The word ‘fractal’, taking the Latin prefix and the English postfix, means originally anomalistic, broken and fractional. Mandelbrot introduced this word to describe irregular and unsmoothed geometrical objects beyond Euclidean geometry’s description. Such objects as sinuate coastlines, undulant mountains, rough sections, changeable and unpredictable cloud drifts, snaky rivers, interlaced blood vessels, dazzling constellation, etc. with irregular and unsmoothed characters are all fractal.

To give a polished and sententious definition to fractal is very difficultly. In the monograph entitled Fractal Geometry-Mathematical Foundation and Application, the British mathematician Falconer has proposed that the definition of fractal should be given in a similar way to the definition of life given by biologists, i.e. not to seek a determinate and sententious definition, but to describe the characteristics of fractal, to treat fractal as set $F$ having the following characteristics:

1. $F$ has accurate structure, i.e. its details in a discretely small scale include the whole.
2. $F$ is irregular, so it can’t be described with the language of traditional geometry.
3. Generally, $F$ has self-similarity in some way, approximately or statistically.
4. Generally, the ‘fraction dimension’ defined by $F$ is larger than topological dimension of $F$.
5. The definition of $F$ is generally very simple, sometimes reduced.

At present, these opinions have been accepted by the majority of people.

According to our search, articles considering and understanding Chinese Fengshui theory from the point of the characteristics of fractal have not been found yet. Our viewpoint on the planar form principle of Chinese Fengshui Theory is as follows:

The principle is considering the shape of human body to be a Cardinal shape; the selection of surrounding terrain, the planning of cities and villages, the design of houses, are all performed in this Cardinal shape of human body, so as to keep harmony between the natural and man-made environment and humans in shape, to achieve the ideal state of ‘harmony between human and nature’ and ‘regarding human as fundamentality’ sought for by Fengshui.

2. The emblematical terrain pattern of Fengshui

Ancient Chinese people considered human as negligible when compare with mountains and rivers, so that all human behaviors should be in harmony with natural environment. The Chinese ‘Book of Changes’ and Fengshui proposed ‘similarities between human and nature’, regarding the mother earth as similar to a human body. A city, a village, a house, a building, a residence, a room, even a human body, each of them is a Tai-ji (from ‘Book of Changes’, the Tai-ji is the origin of everything on earth) in different hierarchy. In ‘Huangdi’s Book of Houses’, it is proposed to consider terrain as body, spring water as blood, ground as skin, grass and trees as hair, houses as clothing and gate as coronet, and such pattern is precise, elegant and auspicious.

In ancient Fengshui theory, the mother earth is often compared to human body to analyze all factors, i.e. ‘identifying terrain as identifying human’. This point had been more explicitly described in ‘Book of Xuan Ny Qing Hai Jiao’, it described the pattern of terrain in the following way:

The back mountains should be long enough, the form of the body should be regular; hands and feet should be harmonious, the elders and the younger should be arranged some order, the master and guests should get along well.

Meng Hao (Qing) in his ‘The Assured Explain about Book of Chaste Heart’ divided the ‘Xue’(like the acupuncture points) of ‘Long Mai’(dragon vein) into three sorts: the upper one is at the head of human body, the middle one is at the umbilicus and the nether one is at the private parts. Concretely, the upper Xue is just like the fontanel of a baby with a shallow pit. The middle Xue is like the umbilicus of human. And the inferior Xue is like the private parts of men. In ‘Book about Terrain by Liupu Shen Xin’, there was a figure which regarded the ‘apertures’ of human body as prototype of Fengshui points, illustrating the idea of ‘similarities between human and nature’ in Fengshui theory.

There are explains of eleven composing factors of an ideal site according to Fengshui theory:

1. Zushan, the primary mountain of the
mountains behind the site;
(2) Shaozushan, the mountain in front of Zushan;
(3) Zhushan, the head mountain in front of Shaozushan and behind the site, also called Lailongshan;
(4) Qinglong, the secondary mountain or hillock on the left side of the site;
(5) Baihu, the secondary mountain or hillock on the right side of the site;
(6) Hushan, the mountain on the outside Qinglong and Baihu;
(7) Anshan, the nearby mountain in the front, separated with the site by a river;
(8) Chaoshan, the distant mountains in front of the site, separated with the site by a river and Anshan;
(9) Shuikoushan, the mountains standing on the left and right side of the river outside the site, usually situated at the entry of a village or a town, facing each other symmetrically across the river;
(10) Longmai, the mountains connecting Zushan, Shaozushan and Zhushan;
(11) Longxue, the best place of the site, situated in front of Zhushan, encircled by the mountains and rivers. This site is regarded as the influx point of spirits of everything on earth, an auspicious site suitable for inhabitancy.

To form such an ideal site, the following four factors are extremely important, that is Qinglong (blue green dragon), Baihu (white tiger), Xuanwu (black tortoise) and Zhuque (red bird). In the overall pattern, Zhuque dances in the front, Xuanwu crouches in the back, Qinglong wriggles in the left and Baihu pronates in the right. Thus a symmetrically embraced pattern with proper relation between positions of high and low, front and back, between guest and host, is formed. The description about ideal terrains of Fengshui in the volume The Mnemonic Verses of Danjing of Integration of Yangzhai by Yao Yan-luan (Qing) is as follows:

Site selection is necessary for building a house and a site backing mountains and facing water is ideal. The Lailongshan should be sinuous and flourish like aflutter beautiful hair and rivers should surround the site. A spacious site means blessing and a Closed Shuikoushan means fortune. Build houses in such a site so that evil spirits are rejected from towns and villages and each clansman is happy and lucky.

Try to imagine, looking upon Zhushan as a head, Longmai as hairs, Zushan as coronal, Qinglong and Baihu as left and right arms, Anshan as the palms surrounding in the front, and Mingtang as broad kyte, it is just like the image of a man, isn’t it?

3. The ideal house pattern of Fengshui
Houses are basic units composing towns
and villages. As for the ideal house pattern in Fengshui theory, the concrete description in ‘Book to understand of Yangzhai(houses)’ is as follows:

The best house pattern is like this; there are two lines of rooms on the central axis and two wings of adjunctive rooms on both sides. The back line of the house can be composed of three bays including one hall and two bedrooms or five bays including one hall and four bedrooms. The back line is where the principal room is located, with the quadrato patio in the middle and two passages lying on both sides respectively. In the frontal line of the house there are one hall and two bedrooms too, and the back hall is narrower and longer than the frontal hall in several chi. The frontal hall is used as the second gate, with building walls outside. The first gate is set on the centric building wall to welcome the ‘spirits of mountain and river’. There should be two wings of adjunctive rooms on both sides of the principal rooms, one is leftward and another rightward, like both hands of a human surrounding in the front. There should be long and straight patios in the adjunctive rooms. The position of the back line of the house is taller than that of the front in several cun, The height of the back line of the house is taller than that of the front in five or six chi and the adjunctive rooms are separated into two segments like arms of human. The ground of the first segment of the adjunctive rooms is of the same lever as rooms of the back line and the ground of the second segment is of the same level as rooms of the front line. The patios on both sides are in the shape of “Ⅰ”, the first segment of the patio is of the same depth as the inner patio and the second segment is 3 cun’s deeper than the first segment. The height of the first segment of the adjunctive rooms on both sides is the same as the height of rooms of the front line and the height of the second segment is six or seven cun lower than height of the first segment. The basement of both sides of the adjunctive rooms should stand three chi and five cun’s distance back from the principal rooms, like two hands reaching out from shoulders, the above mentioned is the best pattern. The second pattern is a house with three bay of rooms and two corridors, with the middle hall as the body, rooms of both sides as arms, the two corridors as palms, the patio as mouth and the front bounding wall as crossed fingers. Such a pattern is also a lucky one. Another record is like this:

Straight and long patios on both sides of the adjunctive rooms are like two arms, the adjunctive rooms like shoulders and the atrium likes belly of human body.

It is a pity that we can’t find relevant pictures suitable for these descriptions. But it is clearly seen from above-mentioned that the ideal house pattern is the image of a man with two hands surrounding in the front, exactly like the ideal pattern of a terrain.

4. The ideal graveyard form of Fengshui

The ancient Chinese considered that living is only a sector of his existence. There should be an ideal inhabitancy environment even after death, just like before his death. That inhabitancy after death is graveyard. in nature, to bury the corpse of forefathers is a kind of comfort to the posterity, which is where the Fengshui terrain for graveyard comes from. According to records in ‘Book About Grave’: ‘Burial isn’t for corpses, but for hearts, isn’t for the mountains and rivers, but for the spirits of human.’ The principle of Fengshui theory is embodied in the following two aspects, the pattern of exterior terrains, and the shape of tomb. Generally speaking, the former is the same as the pattern of terrains of houses, i.e. there should be Zushan, Shaozushan, Zhushan, the left Qinglong, the right Baihu, Chaoshan, Anshan, Shikuanshan and etc., also forming an overall form of surrounding by mountains and rivers, still being alike with a man making a bow with hands folded in front. As for the shape of a tomb, the description in ‘A Dream of Red Mansions’ is like this, ‘Although you have inexhaustible fortunes, but you need a steamed bread made with soil lastly’. In ancient China the shape of tomb is ordinarily the steamed bread made with soil. On one hand it is convenient for piling up earth on the tomb, on another hand it reflects a desirable shape of a tomb. Except for the tomb itself, relatively rich family usually build a burying ground around the tomb to hold a memorial ceremony for ancestors or to stay for a little while. The boundary of such burying grounds usually has a wall in the shape of a major arc to the opposite of the tomb, connecting with two walls in the shape of minor arc or straight line on both sides. The grave mound where the tombstone is located is the place for sacrifice. Figure 2 shows the above-mentioned pattern.

Fig. 2. the burying ground of ancient Chinese
If look upon the top major arc as the head of a human, the two minor arcs at both sides as two hands, the locus for locating the tomb, which is usually called ‘Xue’ in Fengshui, as navel, and the space between the tomb and the curved walls as chest and abdomen of human, this is also the image of a man making a bow with hands folded in front.

Hereinafter there are some photos of famous ancient tombs collected by the authors, for reference.

Fig. 3. the tomb of Yuerong

Fig. 4. the tomb of Dingrichang

5. Conclusion

From above-mentioned it is obvious that:

(1) In traditional Chinese Fengshui theory, the terrains, houses and tombs, all form patterns of “a human” making a bow with hands folded in front. These similar images, adding to the image of a person making a bow with hands folded in front when they meet each other in real life, form a set of human shape with three cascades. In this set, the smaller conformations image the larger or the whole. These irregular shapes can’t be described with language of traditional geometric and have self-similarity, so they possess fractal characters.

(2) The differences between these shapes and an exact fractal set are that the reduced cascades are finite and these shapes have some approximations.

(3) These shapes imaged as ‘human’ in Chinese Fengshui reflected the ancient Chinese philosophy of ‘regarding human as the fundamentality’ and the humanistic idea of “peace is valuable”

(4) In ancient Chinese Fengshui theory the fractal rudiment had been found.

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