

Communicating the Meaning of Nature-texts: An Ecosemiotic Enquiry of Chinese Gardening and Penjing*

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Abstract: Nature-text is an important concept in ecosemiotics. Unlike the traditional notion of text, nature-text considers natural environments as units of meaning with double dimensions of semiosis, that is, intratextual biosemiosis between organisms and intertextual semiosis in cultural communication. To a great extent, the latter affects meaning generation of the semiotic texts, and the quantity, type and process of the former. As Chinese gardens and penjing are characteristic nature-texts, examining and interpreting them from an ecosemiotic perspective would shed light on the cultural effects on meaning generation and communication of nature-texts, and on the interaction amongst various phases and forms of biosemiosis.

Keywords: nature-text, biosemiosis, Chinese gardening, penjing

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Ecosemiotics has developed as a sub-discipline from biosemiotics, and is preoccupied with the semioticized meaning relations of the biological subjects with their environments. It asks key questions of how natural environments are endowed with cultural meanings, and how signification and communication of these cultural meanings in turn affect the biosemiosis in natural environments. As a holistic and integrated unit of meaning, a text signifies and communicates meaning, and therefore, to examine its meaning generation and communication is crucial to semiotic studies. Based on the concept of nature-text, this article intends to explore the semiosis and meaning generation of Chinese gardening and penjing from the double dimensions of biosemiotics. Chinese gardens and penjing are not only a representation of nature, but also constitute parts of nature. Therefore, they are rhetorical, symbolic and aestheticized as those depicted in literature and arts, and meanwhile, biological, semiotic and physical. As is shown in this article, biologically, Chinese pre-modern gardening techniques served to alter the plants' original forms and their semiosis in terms of its quantity and type. More importantly, these scientific and practical codes mingled with philosophical, metaphorical, visual aesthetic codes combine to construct the signification and interpretation of the nature-texts.

Chinese gardening and penjing as nature-texts

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In contemporary semiotic studies, the research paradigms and methodologies developed by Tartu-Moscow Semiotic School are unique and significant. On the one hand, this school clearly shows leanings towards natural scientification, evident in the concept of “semiosphere” proposed by the school’s leading thinker Yuri M. Lotman, and in biosemiotics which has developed based on his theories. On the other hand, the school is noted for its text-centered preoccupation. Here, text is not confined to written texts, but should be understood as the total unit of meaning and the basic unit of culture. In the process of communication, the evolution of the textual meaning constitutes a key factor for cultural polysemy. Peeter Torop comments on this new perception on text: “The usage of the term communication in textual analysis meant, in fact, a semiospherical turn already before the concept was born. The same way as it is possible to understand texts in various ways, it is also possible to analyse this understanding in several ways” (Torop, 2005, pp.167-8). As the concept of text is broad and resilient, how to define its boundary becomes a critical issue.

Responding to this question, Timo Maran, the Tartu semiotic scholar of the younger generation, proposes the concept of “nature-text”. He explains what this term denotes:

[I]n addition to the written text that speaks about nature and points to nature, it should also include the depicted part of the natural environment itself, which must be, for the relation to be functional, to at least some extent textual or at least textualizable. I will call the unit that is formed through meaning relations from those two counterparts nature-text (Maran, 2007, p. 282).

In this definition, nature-text refers to natural environments considered to be units of meaning. With regard to the question about how ecosemiotics takes natural environments as the objects of study, two different stances and methodologies exist in semiotic studies. One tends to use bio-semiotic approaches to study the relations of meanings amongst biological organisms and eco-communities, and the other espouses cultural ecosemiotics, with its key theories developed by scholars like Kalevi Kull, and is concerned with meaning relations of this kind of meaning units with men, and in particular, with culture. The latter attitude indicates that the nature-text must be language mediated. What Maran affirms and adopts is a perspective in line with cultural ecosemiotics, that is, a stance that sees nature-texts as texts mediated by language, though not necessarily described by language. This view holds that in human epistemology and meaning relations, language plays a fundamental role.

Maran points out that nature writing is the most characteristic nature-text. Unlike writing about/depicting nature, nature writing has grown into a literary genre with the development of ecocriticism and assumes a modernity. Commenting on Henry David Thoreau’s nature writing,

Edward Hoagland says, “nature writing now combines rhapsody with science and connects science with rhapsody, and for that reason it is a very special and a nourishing genre” (Hoagland, 1988, p.1). Thoreau’s religious meditation combined with scientific observation has endowed this particular literary genre with a distinct style. Furthermore, Thomas J. Lyon subtly divides nature writing into seven groups, including field guides and professional papers, nature history essays rambles, solitude and back-country living, travel and adventure, farm life, and man’s role in nature (Lyon, 1989).

Taiwan scholar Wu Mingyi also puts forward his conceptualization of nature writing. He contends that nature writing as a genre should encompass certain shared traits. Above all, nature serves as the predominant subject matter. Secondly, the author gazes, observes, records, explores and discovers nature. Thirdly, nature writing incorporates knowledge and natural codes involved in the disciplines of biology, ecology and ethics. Moreover, nature writing resorts to various representational methods and narrative forms, such as journals, travelogues, chronicles and reports (Wu, 2003, pp.12-3). This definition implies several qualities of nature writing. Firstly, non-fictionality constitutes an essential attribute of nature writing which excludes genres such as novels, dramas and parables with a strong fictionality. Secondly, modern sciences, biology in particular, have exerted considerable influence on nature writing. Developing rapidly in modern times, biology and its sub-disciplines have aroused greater ecological concerns with human relations with the environment, and offered a series of important codes to be brought into nature writing. Therefore, the biological and ecological inquiry and analysis of texts about nature writing came to form a crucial part of ecocriticism.

From Maran’s definition, we can see that though being not “nature writing”, the natural environment taken as units of meaning (such as semi-natural communities popular in Estonian culture, seaside lawns, tree lawns and so on) can also be qualified as nature-text. If we consider natural environment as a meaningful combination of signs, it would be inspiring to examine this textualized form of nature for it reflects a certain culture’s attitude towards nature and specific natural objects. It can also help us see how the meaning of nature changes with human practices. Undoubtedly, this is of great significance to the critical inquiry of ecosemiotics, that is, to study the role of nature in culture and the communication between the two.

Since natural environment as units of meaning can be taken as a text, gardening, capable of producing rich aesthetic and cultural meanings, can also be seen as a quintessential form of nature-text. Chinese gardening examined in this article encompasses the traditional styles of garden, landscape parks and parks in general, but it also differs from these models with its own distinct forms and elements. French philosopher Baldine Saint Girons points out that the scope of

gardens must be properly defined to encompass those with natural elements reorganized and reinvented into new forms of nature, the so-called “third nature” between primitive nature and courtyard nature (Baldine, 2012, p.31). A natural environment with more or less fixed formal attributes, distinguishable from wild nature, can be defined as a garden.

The art of gardening can be divided into three major systems: Chinese gardening, Western gardening and West Asian gardening. Chinese gardening began to develop into a mature art during the Wei Jin southern and northern dynasties. But the earliest gardening activities could arguably be traced back to the period of the Yellow Emperor. In *History of the Song Dynasty: Records of Auspicious Omens*, it is documented that “the Yellow Emperor wore yellow robes and fasted in the central palace above Xuanhu and Luoshui rivers. Phoenixes came and perched. They did not eat insects nor step on the grass, but stopped at the emperor’s eastern garden, or nested on a pavilion, or sang in the courtyard. The male bird sang and the female bird danced.”¹ However, till the Qin and Han dynasties, the so-called gardens had mostly been demarcated large areas built around mountains and waters with little artificial alteration. This was very different from the later gardens. The *Shanshui* (mountains and waters, landscape) aesthetic of the Wei Jin southern and northern dynasties formed the grounding for the subsequent development of gardening art. As the *Shanshui* aesthetic emphasizes the idea of “physically approaching the natural landscape” (身即山川), scholar-officials and literati gradually cultivated a taste of bringing the grand view of natural landscape into the small space of daily life. As a result, gardening art started to develop rapidly, and the tendency of “human and cultural nature” became ever visible. Wang Guixiang describes the fundamental characteristics of the imperial gardens formed in the early Wei and Jin dynasties:

The gardens of the Qin and Han dynasties purported to be grand with real mountains and valleys enclosed, covering an area of hundreds of square miles. Kept in these areas were various rare birds and animals, and even tigers, leopards, bears and other beasts. These landscape gardens were usually places for emperors to ride for hunting. However, the imperial gardens in the southern and northern dynasties began to turn moderate, and many more artificial elements were brought in, such as buildings, artificially stacked rocks, particularly amorphous stones and man-made water bodies (Wang, 1997, p.105).

This description captures the aesthetic imagination and reinvention of nature in the early times.

Chinese gardens tend to display contrasts between remoteness and closeness, sparsity and denseness in space, with winding and irregular lines and paths. This is very different from the geometric layout of Western gardens. Through the spatial jaggedness, Chinese gardens are

¹ In this article, all the textual examples of ancient historical, literary and botanical writings are quoted from *Si Ku Series* (四库全书, *Complete Collection in Four Treasuries*, which is a massive collection of Chinese scholarship from antiquity to the 18th century, compiled under Emperor Qianlong in the Qing Dynasty)

carefully designed to create a realm and a mood out of the natural objects, and whereupon there arises a popular poetic idea of “borrowed scenery from nature” (借景). Unlike the strict mathematical and physical parameters followed in the layout of Western gardens, Chinese gardens do not employ a fixed format— “constructing gardens without set rules”(构园无格), so to speak. Perhaps the only thing that matters is whether the comely part of the landscape can be separated and foregrounded from the uncomely part. This is a method of “incorporating the beautiful while screening the vulgar”(俗则屏之, 嘉则收之), in order to create an aesthetic realm, with the fusion of form, color, sound, and light, where mountains, clouds and shadows intermingle and set off one another. An aesthetic realm invented in this way is founded on nature, and yet is also above nature. The result of this is a holistic semiotic text capable of generating sophisticated aesthetic, rhetorical and symbolic meanings. Comparing urban landscape to a cultural text, James S. Duncan argues that landscape symbols are not natural ones, but are deeply implicated in various semiotic discourses, revealing the hidden cultural structures (Duncan, 1990, pp. 209-215). The same is true of the space created by gardening art: whether to veil or display certain natural symbols is deeply rooted in the cultural structures where they arise. More precisely, how gardens select and present semiosis of nature is controlled by the standards and operations involved in the cultural semiotic mechanisms behind.

Similar patterns of culturally mediated semiosis also apply to penjing. Penjing, known as bonsai in Japanese, was originated in China and spread to Japan, Vietnam and India. As the antique Chinese art of creating landscapes, it depicts trees, rocks and other plants which are placed in containers for display. Above all, pengjing, also called landscapes and gardens in miniature, closely resembles a real garden in its layout, constructing and modelling. Though compared to a garden, pengjing is immensely smaller in its size and volume, it shows similar spatial traits. Particularly for relatively larger-scale tree and rock penjing combining attributes of plant and landscape penjing, it is able to display a variety of plants with different colours and shapes, suggesting a rhetoric of synecdoche and symbolism through contrasts between various heights of plant communities, between covering and exposing, and thereby, achieve a visual effect quite similar to landscape gardens.

Moreover, such a resemblance also stems from the connection in aesthetics shared by both penjing and gardening art. Scholars have pointed out that the cultural origins of penjing art are rooted in the *shanshui* aesthetic forementioned. Such an aesthetic embraces cultivating individual disposition with “extensive landscape sight-seeing”(饱游卧看), and asserts to depict and represent landscapes within “a tiny space of a square inch”(方寸之间). Predicated upon the form of the natural object, this representation must transcend the object/landscape itself to pursue a more

sublime emotion and realm, and thus to express a natural and vivacious interest through contrived design. This aesthetic principal has always been at work in the evolution of Chinese landscape painting and the creation of penjing and gardens. Wen Sheng points out that both gardens and penjing “foreground lyrical and impressionistic qualities by adopting methods of romanticism and realism, and neither is merely an imitation of nature” (Wen, 1990, p. 5). Representing nature in this way does not seek to accord fully with the original form of nature but serves to modify and reinvent nature based on certain aesthetic rules and cultural ideals. This method can be described as “creating images to express subjective feelings and thoughts”(立象以尽意), and this is precisely what is shared by the art of gardens and penjing. In this article, both forms of art would be scrutinized as examples of nature-texts.

For gardens and penjing as nature-texts, their semiosis is twofold. First, within the particular natural environment, certain forms of biosemiosis are in play. As nature-texts are created by men, culture transforms nature and plays a significant role in the formation of the nature-text. It can be understood as a form of cultural nature. More precisely, culture influences and changes the interpretants and its possibilities produced in the biosemiosis. Moreover, in the cultural communication between sender and receiver, the nature-text that contains a totality of meaning also generates an evolution and diversity of meaning. In turn, such an evolution and diversity would affect the creation and re-creation of gardens and penjing, and affect the internal biosemiosis within the nature-text, and therefore, create a complex interaction amongst signs. In the following sections, the double dimensions of the biosemiosis in gardening and penjing would be examined.

Biosemiosis and communication within nature-texts

As gardens and penjing are man-made arts out of nature, their internal semiosis and external process of cultural communication must inevitably be affected by human operations. These operations include the following aspects.

Firstly, the botanical spatial shapes are altered with the guidance of the semiosis of the auxesis (growth cells). For botanical semiosis is more of iconicity rather than indexicality, most plants would not have intentional actions/immediate reactions to the stimuli on spatial dimensions. Therefore, in order to change the outward look of the plants, one must change their signaling process through physical or biochemical means. For instance, we should remove the apical dominance to facilitate the growth of lateral buds and shoots, and to allow the branches of woody plants to fully develop and expand for subsequent trimming and shaping. In this process, certain chemical agents would be used to alter the growth development of plants. This action may consist

of making use of the plants' sensory systems capable of responding to and transmitting nutrients, in order to pilot the plants to fully receive the outward chemical information and transform it into coding information that can be identified by the cortex cells of the stem. The purpose is to accelerate the transmission of biological information and division of cortex cells, and hence to alter the plant growth forms.

Alternatively, this artificial change can also be achieved through physical means. For example, in the practice of creating penjing in the Ming dynasty, systematic plant pruning methods dealing with stem cortex cells was already brought into use. Interestingly, pruning itself was clearly a physical method, but it relied on the naming of the offshoots of various growth forms, and based on this semiotic action certain offshoots were identified, and later on pruned. Zhou Wenhua, the botanist of the Ming dynasty, wrote in *History of Ru Nan Gardening*, “pruning of various trees and plants must follow correct methods and rules, that is, to remove draining shoots (downward ones), stabbing shoots (inward ones), shoots growing abreast (linking ones), superfluous shoots (entangling ones), windy shoots (slim and lank ones), lateral shoots (newly grown).” As is mentioned, plant forms are more or less symmetrical, usually in line with human visual beauty. But penjing is not to be appreciated as naturalistic, rather, it seeks to achieve an asymmetrical effect with an elimination of the original plant form in favor of a warping and slanting effect. Chinese literati scholar Gong Zizhen remarks, “plum blossom is viewed as beautiful for its tortuosity, charmless if grown upright; elegant for its lean posture, ungainly if straightened up; comely for its sparsity, shapeless if placed in a thick way” (梅以曲为美, 直则无枝; 以欹为美, 正则无景; 以疏为美, 密则无态。). Though he is critical of the excessive manipulation of penjing, it is apt of his remarks on the art of penjing, that is, it takes as its aesthetic criteria its winding and crooked forms. Therefore, apart from pruning, palm fibre and metallic threads were also used to remove or alter parts not conforming to such aesthetics. With these operations, aesthetic criteria set up by cultural norms have changed the original biological forms and reinvented habits of visual aesthetics.

Secondly, human interference would result in producing new types of semiotic activities. This is primarily manifested in operations of grafting and hybridizing. The practice of grafting various plants in Chinese gardening is said to be descended from the Zhou dynasty. The semiotic thinking in ancient culture associated human virtues with the thriving of vegetation, as suggested in the saying, “when virtues reach grass and woods, they grow interconnected.” (德至草木则木连理) Thus, the grafted “auspicious tree”(瑞木) has long been an important token for appreciation. As is documented in *The Flower Mirror*, grafting could be used to improve the original plant species: “Small flowers can be enlarged, single petal can be doubled, red colors can turn purple,

small fruits can grow huge, sour and bitter flavor can turn sweet and foul smell can be fragrant. The course of nature can be reversed with human efforts, once one knows the crafts of grafting and altering” (Chen, 1962, p.45). The changes in traits brought by grafting can be understood as a result of the new semiotic activities of plants. One of the original plant’s semiotic activities is replaced by the new grafted plant’s semiotic activity, while other older semiotic activities remain unchanged, creating a plant with dual advantages.

This grafting method is very popular with scion grafting. For instance, red maple for its vivid foliage colour and elegant shape is commonly used as a suitable ornamental plant for creating penjing and gardens. However, its root cells are not quite sensitive to nutrients. As a result, fewer converted nutrient signals can be received by its growth cells, and thus less auxin secretion produced. Thus, the growth process of red maple is relatively long, its branches and leaves sparse. To make it more suitable for penjing, gardeners usually graft red maple with green maple, and thus the semiotic activity of the green maple would be replaced by that of the red maple, a process bringing sufficient nutrient signals to its growth cells. This enhanced transmission would promote cellular division and growth of leaves and branches, enabling the plant to develop rapidly and luxuriantly. At the same time, the red maple leaf cells would maintain their sensitivity to acidic substances, and with this signal transforming into the anthocyanin’s semiotic activity, the original colour would still be preserved. In distant grafting, examples abound about using new semiotic activities to replace one or several of the original semiotic activities while retaining the rest. In *Crabapple Record (Haitang Pu)* compiled by the scholar Chen Si of the southern Song dynasty, the scion method is mentioned of grafting the branches of the crabapple tree onto the pear tree: “In the capital city, flower-grafting craftsmen attach the tender branches to pear trees, enabling them to thrive.” Apparently, this method has widely been used in the ancient times.

Moreover, hybridization technique has also been widely used in horticulture for purposes of creating more attractive and innovative colours and shapes in plants to enhance their ornamental and appreciative value. It can also be applied for turning the plants’ advantageous and yet masked recessive genes more expressive and dominant, in order to confer the plants better growth ability and greater resistance to diseases and pests. Grafting hybridization was the major technique employed in ancient Chinese horticulture and floriculture. For example, Song scholar Zhou Shihou’s *Record of Luoyang Peonies* describes two valuable types of peonies, Shengwei and Dusheng: “Shengwei resembles Wei flowers but is slightly darker, Dusheng resembles Wei flower but with larger leaves and pale purple-red color. Have both types evolved from Wei flower? Is it possible that when grafted onto red flowers, the offspring turns into Shengwei and when grafted

onto purple flowers, the offspring turns into Dusheng?” The botanist Liu Yongsheng points out that this phenomenon can be explained by the adverse genetic theory proposed by Mi Qiulin. The theory proves that the traits exhibited by grafted plants mostly come from the grafted scion, while those in plants grafted by seeds are primarily absorbed from the rootstock (Liu, 2000, pp.46-7). This is because the major traits of plants are determined by their older organisms.

In the scion grafting method, the genes of the grafted branches, which have already developed, do not change significantly. The major change takes place as the cellular signal activity of the root has been replaced by those of the rootstock. But graft hybridization is different. As the seed has developed within the rootstock, the cortical cells of the seed would undergo chimerism with the cells of the rootstock in the growing process. The chimerism would result in the formation of new cells: a new cell body with dual cell information functions. The information identified and transmitted by the new cell body, with its decoding process and the activation of auxin, is discrepant from those of the original two plants, and thereby exhibits the traits of both plants (with the rootstock being dominant).

This result also applies to new ornamental species created through hybridization by sexual reproduction. At present, this method is widely adopted in the immensely popular penjing made of succulent plants. A significant feature of Crassulaceae plants manifests itself in the relatively close phylogenetic relationships amongst various genera distributed within the same region, and this makes it easier to cultivate new species. Although Europe has been cultivating succulent plants since the 1870s, large-scale hybridization and cultivation of Crassulaceae plants as ornamental ones had not achieved a real breakthrough until the 1960s and 1970s. Due to the convenient operation of cross-pollination in succulent plants, their cellular activities can readily be altered and newly created species would express distinct inherited traits from both parental and maternal genes. Consequently, this method becomes increasingly popular in modern penjing practices.

Finally, human operations would bring about the changes in quantity of the semiosis among the biological species. In gardening, in order to achieve stronger visual effects and express certain symbolic meanings, one must control the number of plants and introduce exotic species. As Kull comments, “living with nature ultimately means changing nature....The most colorful and species-rich old meadows in Estonia are a result of human management which created them less than two thousand years. The model of nature’s beauty and naturalness, which people apply when protecting valuable areas, are ideal models, which, due to this, change the order of nature” (Kull, 1998, p. 361). Plant management in gardening consists of steps of pruning, mowing, planting, watering, bringing in exotic species, and so on. These acts, on top of creating aesthetic effects, also serve for creating a small, ecologically balanced system with diverse species and abundant

biosemiosis. A small-scale ecosystem of diversity could be built, as Kull says, “provided the management is mild and regular over a very long period of time” (Kull, 1998, p.361). Though we might slightly disagree with him about how long the managing period should be, we can see that in gardens, due to less competition in the plant communities and conditions of light and density favorable for plant growth, the mutual semiosis between plants and animals are rather more balanced and diverse. Discussing semi-natural plant communities in Estonian gardens, such as arboreal lawns and seaside lawns, Maran argues that in these nature-texts with cultural attributes, the semiosis of plants and animals is more balanced and heterogeneous, and thereby, managing nature through gardening would enhance the diversification of the ecosystem.

The *Franklinia alatamaha*, extensively cultivated in American gardens, is a good example of how gardening can improve the diversity of the ecosystem. This kind of tree belongs to the genus *Camellia*, and as its flowers are of high appreciative value it was brought back from Georgia by the American botanist William Bartram in 1765 to be planted and named in honor of Benjamin Franklin. Due to natural disasters, and continual damages of plant diseases and pests, the *Franklinia alatamaha* growing in the wild was extinct in 1803, while those trees growing in the gardens survived with human preserving efforts and even spread to Europe and Asia. As a plant species and a cultural symbol, *Franklinia alatamaha* has enriched the natural ecosystem and its network of biosemiosis. This anecdote in botanic history clearly exemplifies the positive effects of cultural semiosis on biosemiosis.

Generating and communicating cultural meanings outside nature-texts

Gardens and penjing can be seen as forms of culturalized nature, and these nature-texts are characterized by meaning generation and communication at the cultural and aesthetic levels apart from their biosemiotic functions and meanings. In the process of cultural communication, the meaning of the nature-text could to a great extent vary from one receiver to another because of their discrepant backgrounds. Therefore, it is possible for Western and Eastern perceivers, as receivers of the same garden text, to make entirely different interpretations. When appreciating Chinese gardens, even Baldine Saint Girons, the French sinologist well acquainted with the Chinese culture, would naturally compare them to the Kingdom of Heaven and the Garden of Eden (Girons, 2012, p.35). This aesthetic view is deeply rooted in the Western cultural and religious traditions, and plausibly, individuals from another culture may offer a completely different interpretation facing such natural texts. For the Chinese observers, the garden is a place for “approaching the landscape for artistic materials”, and an aesthetic and leisurely projection of “extensive sightseeing”. An individual immersed in the *Shanshui* aesthetic traditions would find their interpretations irrelevant to the transcendental concepts of religion.

However, the formation of various interpretants does not mean that the meaning of the nature-text generated in the process of communication depends entirely on the interpreters. As Yuri M. Lotman argues, “certain set of interpretations is filtered through another set, and this results in a new competition of possible interpretations and a new semantic augmentation”, a process “filtered through the code of tradition” (Lotman 1990, p.70). Etymologically, the word “code” comes from its Latin root “cordex”, meaning “rule” or “principle”. Thomas A. Sebeok takes codes as the conventions which set the rules of meaning generation and enable consistency of information in signification and communication, the two important phases of semiosis (Sebek, 1972, p.75). Therefore, codes are seen as a set of inter- and intra- textual rules employed to create and interpret a text. Zhao Yiheng concisely explains, “in semiotic expressions, those rules implanted to control textual meanings and those used to control the reconstruction of meaning in interpretation can both be defined as codes” (Zhao, 2010, p. 284).

In *The Role of the Readers: Explorations in the Semiotics of Texts*, Umberto Eco categorizes codes into several groups: basic dictionary, rules of co-reference, contextual and circumstantial selections, rhetorical & stylistic overcoding, inference of common frames, inference of intertextual frames and ideological overcoding (Eco,1984, p.14). The encoding mechanisms of artistic texts are marked by multiplicity and “loose encoding” that allow interpreters more liberty and diverse interpretations. In loose encoding, the additional rhetorical, stylized encoding of artistic texts serves to navigate the predominant interpretation (Zhao, 2010: pp. 224-225). With gardens and penjing, their biosemiosis is written into the nature-texts by the artistic encoding mechanisms, and thereby, nature can be culturalized. In other words, the unordered, indescribable things in nature would be rearranged by the encoding systems of nature-texts, a process in which the cultural and aesthetic mechanisms of the texts would work to exclude elements that do not accord with the encoding procedures and incorporate those that do accord, and then, resettle these suitable elements according to the rhetorical and stylized encoding rules. Notable examples include “three friends of winter”(pine, bamboo and plum,岁寒三友) with distinct cultural symbolism, and trees and plants with colorful leaves and blossoms according with the visual aesthetic.

The art of gardening and penjing as nature-texts has multiple encoding principles. The following would explore several primary principles:

1. Above all, the semiotic way of thinking in natural aesthetics is always in play. For example, in traditional Chinese philosophy, the relationship between the idea of “Tao” and everything in nature are both physical and metaphysical. The connection between the two relies on the cognition of body and mind, and this is implied in the saying “sages could see Tao in everything” (圣人含道映物). Through man’s physical experience of and integration with things in nature, Tao is no longer an intangible or illusory notion but can be perceived as concrete physical forms. Born out of this thinking, the *Shanshui* aesthetic values the artists’ subjective experience of “reflecting nature with mind and representing nature on behalf of the mountains and rivers” (以心灵映象万物, 代山川而立言), seeing nature as a place for daily experiences of appreciating and dwelling.

Therefore, the rhetoric of synecdoche is extensively used in the art of Chinese gardening and penjing. For example, a single plant or a patch of moss covering miniature rocks are depicted as symbols of mountains and rivers, purporting to bring nature home to be appreciated in one's private dwellings. Chinese penjing and gardens, being themselves forms of nature or natural organisms, are usually imitations of nature. They assume the dual functions of "object" and "image" that allow people to imagine the magnificent outer landscape and meditate on the supreme truth of "Tao". By contrast, western gardens tend to present the regularity and symmetry of lawns and trees, and this is attributed to the Western aesthetic and semiotic ways of thinking that underlines strict mathematical proportions and geometric constructs.

2. Furthermore, for certain natural objects, it is very important to generate culture-specific and aesthetic meanings with encoding principles. For instance, moss aesthetic embodied in Chinese gardens and penjing is very different from that in other artistic texts with plants as the carrier. In Western gardening, in the layout of ground surface vegetation, scrubby herbaceous plants are utilized to cover the bare ground for visual and practical purposes. It is only in Chinese and Japanese gardening and penjing, there exists the idea of "cultivating moss" (养苔), and this involves several steps of using mud paste to brush the soaked rocks, placing them in a shady place and then spraying rice soup to promote moss growth, or using sands and gravels to create a surface drainage layer to lay out moss.

As a cultural symbol and a metaphor for the idyllic and tranquil mind, moss is an image and subject favored by many Chinese poets and artists. Jiang Yan, the poet of the southern Song dynasty, composes "Ode to the Moss": "Oh, the attaching pose of green moss, no other things can be compared to. A mist of quiet hangs over the place overlaid with moss, an unspeakable melancholy revealed in silence." (嗟青苔之依依兮，无色类而可方。必居间而就寂，似幽意之深伤。) Tang poet Liu Yuxi's "Inscription of My Humble Room" presents: "The moss creeping onto the doorsteps turns them green, the color of the grass reflected through the bamboo turns the room blue." (苔痕上阶绿，草色入帘青。) These literary examples extoll moss as a symbol for noble and unyielding minds in impoverishment.

Moreover, moss as an artistic image is used to evoke a common and yet indescribable emotional experience shared by people of the same culture. The notion of "objective correlative" proposed by T.S. Eliot would lend insight into the emotional associations of moss in these nature-texts: "The only way of expressing emotion in the form of art is by finding an 'objective correlative'; in other words, a set of objects, a situation, a chain of events which shall be the formula of that particular emotion; such that when the external facts, which must terminate in sensory experience, are given, the emotion is immediately evoked" (qtd. in Cuddon, p. 485). This is true because unlike bamboos, woods, flowers or fruits, moss growing as a single plant in the wilderness or placed in the room would only cause inconvenience and mostly fail to evoke aesthetic associations. It is only when matched with other appropriate plants and natural objects, would it generate a sense of exquisite and refreshing tranquility.

Another Tang poet Wang Bo in his “Ode to the Moss” writes: “Alas! Moss growing in the woods’ pond, an object appreciated by recluse; moss growing in the courtyard, an incentive for dwellers’ mournfulness.” (嗟乎! 苔之生于林塘也, 为幽客之赏; 苔之生于轩庭也, 为居人之怨。) This line shows that the emotional and symbolic implications of moss, as an “objective correlative”, require a natural environment and a cultural context to be comprehended. Another poem by monk poet Guan Xiu goes: “The rock shrouded in mist cannot be painted, the beads of the waterfall and the Osman thus are sweet-scented. The sunset glow dispersing, snow is cleared away, I dug and found fuling² under the pine tree. Cheerful birds sound like the tinkling of vases and jade, fresh moss is so watery, and a golden jar is submerged. I smile when laughed at and given sneering looks, earth-shaking changes could not make ripples in my peaceful mind.” (翠窠烟岩画不成, 桂香瀑沫杂芳馨。拨霞扫雪和云母, 掘石移松得茯苓。好鸟似花窥玉磬, 嫩苔如水没金瓶。从他人笑从他笑, 地覆天翻也只宁。) By setting the image of moss in the leisurely landscape of mountains, this poem portrays a picture in which natural objects of moss, rocks, waterfalls, pines and birds coexist and set off one another in harmony.

Moreover, the fixed pair of moss and bamboo has evolved into a familiar composition of imagery in penjing and Chinese gardening. Tang poet Yao He composes these lines, “antique moss is cold with a greener sheen, the bamboo stands alone in silence” (古苔寒更翠, 修竹静无邻); Qi Ji’s poem “Autumn Moss” depicts a scene of “bright moon shining on a path with sparse bamboos” (月明疏竹径). In *Dream of the Red Chamber*, when depicting Xiaoxiang Lodge where the young heroine lives, the author repeatedly mentions moss paired up with bamboo: “sparse shadows of bamboos, dense or light traces of moss” (竹影参差, 苔痕浓淡); “the path lined by arrays of green bamboos, the ground well covered by pale moss.” (两边翠竹夹路, 土地上苍苔布满。) We can see that as an “objective correlative”, moss, when matched with imagery of pine, bamboo and rock, is able to create a unique aesthetic effect and an emotion of inner solitude, a remoteness and seclusion from society. The nature-text with its internal symbols produced by this unique aesthetic encoding can only be accurately interpreted by receivers from the same cultural community.

Thirdly, conventions of visual beauty would be seen as universal principles. Though gardens of different countries vary a great deal, the aesthetics contained can be shared across cultures and regions. This is because the general visual aesthetic principles are in play. The majority of gardens would follow the encoding rules of grouping and organizing plants according to colours and spatial forms of contrasted heights, for this arrangement conforms to people’s visual habits. These encoding rules remain more or less unchanged despite cultural differences, and thereby could be seen as common principles for Chinese and Western gardening.

² Fuling, *Poriacossus*, is a herbal medicine.

From what is discussed above, due to the fact that various forms of culture and arts have specific encoding principles, gardens and penjing as nature-texts may assume independent qualities similar to cultural texts, with these principles actively at work in producing and communicating their cultural and aesthetic meanings. Meanwhile, these principles further influence the biosemiosis and its communication within the texts. For example, gardening practices such as the cultivation of moss, the creation of artificial landscape out of plant communities, rocks, stones and waters, emphasis on abundance in plant species in Eastern European gardening, all exerted influences on a variety of biosemiosis within the frames of the nature-texts. From this perspective, to explore the interactions of semiosis inside and outside nature-texts in the process of communication has become a proper object of research for studies on nature-texts conducted with semiotic dimensions, and has constituted one of the most important critical enquiries of biosemiotics. Therefore, the concept of “nature-text” could have profound effects in the future development of biosemiotics.

Conclusion

As nature-texts, gardens and penjing generate and communicate meanings at the intratextual and intertextual levels, while following the *Shanshui* aesthetic formed during the Wei and Jin dynasties. To make gardens enjoyable and inhabitable, their design needs to take into account of the abundance and coordination of various biological species and simultaneously follow certain aesthetic rules. Similarly, penjing, as a miniature garden and a nature-text of synecdoche, also partially adheres to these rules of meaning generation. Using plants and rocks as raw materials or “semiotic vehicles” to depict the idealized forms of nature and dwelling, Chinese gardening and penjing endeavour to cultivate plant communities based on their original forms and traits, but also seek to change their forms, with artificial techniques and aesthetic rearrangement, to reinvent the landscape and express the exquisite and lively charm of nature. At the ecological level, gardens have functions of regulating temperature and cultivating biological communities. At the aesthetic level, they embody the cultural ideals and ethical pursuits of the artists, serving as a retreat for human body and mind. Penjing, though lacking ecological regulatory functions, shares the same aesthetic and cultural principles with gardens. In building and appreciating gardens and penjing, and particularly in inhabiting spaces with such nature-texts, an ecological relationship between man and nature could be built as pleasant and integrated. Once textualized, nature becomes an aesthetic object for transcendental gaze, and more intimately, a place for inhabiting and rambling. As text is something woven, these nature-texts, inspired by ideas of ecology, aesthetics and literature from Chinese culture, weave multiple meanings into a physical and spiritual home for Chinese people.

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