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Liang Shaoji's Silkworm Art as Rituals of "*Ziran*": Agency and Techniques
梁紹基的養蠶藝術作為"自然"儀式：能動性與技術

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Abstract

Chinese contemporary artist Liang Shaoji has collaborated with living domestic silkworms for thirty years to create artworks acclaimed worldwide for manifesting the Daoism-influenced ecological motif '*ziran*'. This dissertation examines the material composition and symbolic articulation of '*ziran*' (nature, spontaneity, the way as it is, non-assertiveness etc.) in Liang's oeuvre from an anthropological perspective, a multivocal concept often misunderstood or oversimplified by art critics as Eastern egalitarian cosmology of nature or a less-manipulative approach to nonhumans. Based on my multi-species, multi-sited ethnographic fieldwork in China during 2018-2019, this research demonstrates that Liang's artistic techniques feature intense collaboration with silkworm farmers and biologists and possess a paradoxical state between assertive manipulation and reflective intervention. The dissertation analyses Liang's art series as durational ritual events by mainly drawing on Gell's art nexus framework on agency and Turner's ritual theory on liminality. Broadly contextualised in Chinese silkworm husbandry and silk culture, the study shows that silkworms as agentive performers and silk as a material-spiritual medium jointly dictate the efficacy of Liang's ritual artworks during his 'making-in-cultivating' art practice, rather than roughly standing for nature as the antithesis of industrialization. The thesis concludes that the artist has explored the ambivalence of '*ziran*' by generating anti-structural liminalities namely between industrialization and premodernity, materiality and spirituality, organism and thing, artificiality and naturalness, instead of conservatively representing Daoist principles. This project experiments with ethnography as a new genre of art criticism.

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Introduction

Ecology has become an all-encompassing term amidst planetary environmental crises. In the contemporary art world, for example, artworks related to any pan-ecological issues can be grouped into the category 'ecological art', and as a genre, ecological art has drawn much more scholarly attention in the recent decades compared to its early burgeoning time in the second half of the twentieth century (e.g. Brown 2014; Demos 2016; Kastner 2012; Mckee 2007; Smith 2005; Weintraub 2012). I came across the name Liang Shaoji in 2017 while conducting a brief study on ecology-related art in contemporary China. Born in 1945, he is a contemporary artist who has spent nearly thirty years raising and working with domestic silkworms (*Bombyx mori*) from 1989 onwards. The '*Ziran* Series', often translated as 'Nature Series' in English, is representative of his silkworm art, renowned worldwide for its embedded Chinese natural cosmology.

Liang's silk-bound installations, video works and photography have been exhibited in domestic and international art venues such as the Hayward Gallery (London, 2012), ShanghART Gallery (Shanghai, 2014), Al Riwaq Art Space (Doha, 2016), MWoods Museum (Beijing, 2018) and the Smart Museum of Art (Chicago, 2019). He has also participated in Biennales in Venice (1999), Lyon (2000), Shanghai (2000), Pančevo (2002) and Curitiba (2017). In 2009, Liang was awarded the Prince Claus Award under the annual theme 'culture and nature,' an international award to honour artists and cultural practitioners contributing to cultural development. Liang's art practice is celebrated as offering 'a meditative approach in which art becomes nature and nature becomes art' in the award committee report. Liang named his main series of artworks '*ziran*', a concept he has frequently talked about, pondered over, and attempted to present via art and has been acclaimed for in the art world.

Not surprisingly, Liang Shaoji's silkworm works are often categorised as 'ecological art', as his projects involve non-human partners, the silkworms, on the one hand, and are also interpreted as dealing with human relations with nature by art critics — a point I

will return to discuss in detail later. Liang's artworks have been juxtaposed with other works belonging to eco-art, bio-art or artefacts in group exhibitions under titles such as 'Longing for Nature, Reading Landscapes in Chinese Art' (Museum Rietberg, 2020), 'Growing' (Chronus Art Center, 2019) and 'Trees of Life: Knowledge in Material' (NTU Centre for Contemporary Art Singapore, 2018). This adaptability in versatile positions in the contemporary art world is partly because the triangular relationship between the artist, the material (silk), and the organism (silkworms) complicates the interpretation of Liang's silkworm art.

This complicatedness was evident when I attended the opening of Liang Shaoji's solo exhibition 'As If' at MWood Museum in Beijing (14th September 2018) where I encountered two photographs of his installation 'Snow Cover' (*xue-cang*) on site. 'Snow Cover' contains many discarded objects, such as an empty coffee carton, a telephone, a cell phone, an integrated circuit board, some poster paper and a plastic cup, all scattered on a wooden board. The everyday objects on the flat board are covered under a full sheet of white and translucent silk threads, with entangled filaments discernible and shimmering under the light (fig. 1). I arranged an interview with the artist two days after the opening when Liang Shaoji and I talked on a couch in the museum's office space.

I asked about 'Snow Cover', one of my favourite installations among his silkworm pieces: 'Some critics I read got a sense of "covering-up" and "erasing" in this work (von Drathen 2011; Xia 2015),' but my feeling towards it is more like "inclusion." What do you think?' When these critiques touch on the ethereal visual presentation of 'Snow Cover' and its possible conceptual connotations, I perceive a vaguely shamanic spark in this work and therefore would like to know the artist's explanation. Liang answered: 'I would rather say it's about "healing". The "flat cocoons" spun by the silkworms are light, white and ethereal, like a handful of snowflakes. Silk as a material contains proteins, one of the most fundamental biomolecules comprising life forms and it serves as a treatment in this installation to re-provide you with the key element of life. The winter snows, on the other hand, are nourishment for the land, and under the snow cover is not death but endless transformation and hope.'

Figure 1: 'Snow Cover', 2013-2014 (Photo: ShanghART Gallery)

It was a poetic exposition where an analogical association was made between white silk and white snow through their material and functional characteristics. The concept of 'healing' also crept back into my mind from time to time when I later explored more into the 'flat cocoon' technique employed by the artist to create most of his silk-bound installations such as 'Snow Cover'. Healing has 'religio-magical' undertones especially in anthropological contexts when its enactments involve body, mind and spirit and

emphasize process, embodiment, sensation and aesthetics, thus regarded as the litmus test for the ritual efficacy. Liang's answer to the implication of 'Snow Cover' has triggered more inquiries in my research. What was it like for the silkworms to crawl over the human-used material and secrete 'flat cocoons' on them rather than the habitual ellipsoidal cocoons? What happened to the silkworms and the artist in the processes to complete those large-scale installations? Does 'healing' in 'Snow Cover' make sense only on a symbolic metaphorical level, as a wishful projection on the silk and silkworms, or is healing also enacted on a ritualistic if not a functional level? 'Snow Cover' became the entry point for my research project on Liang Shaoji's artistic collaboration with domestic silkworms.

Meanwhile, when attempting to understand '*ziran*' and its associated culturally particular natural cosmology in Liang Shaoji's art practice, I realised that art critics focusing on iconographic, aesthetic and ethical qualities of artworks fail to address the generative relations between silkworms and the artist in the art-making processes and the vital role of silk as a physical, functional and metaphorical medium (e.g. Gladston 2011; von Drathen 2011; Xia 2017; Yang 2018; Zulueta 2016). Moreover, the physical and symbolic continuity of silk-silkworm assemblage in Liang's projects destabilises the boundaries between body, organism, object and material etc., and thus challenges the analytical categories of bio-art, animal art, ecological and conceptual art in contemporary art criticism. If provisionally translating '*ziran*' with Daoist connotations as merely 'natural', the questions still follow as such: Is silk a natural material to be employed? Does the generative alliance between silk and silkworm count as a natural relation? Does the artist work as part of nature or work on nature? Does '*ziran*' (natural' or harmonious) appropriately describe the ways Liang worked with silkworms to create art as claimed by both the artist and art critics on his silkworm projects? After all, how do human and non-human organisms, natural and non-natural materials and artistic techniques in the trans-species interaction determine the efficacy of Liang Shaoji's silkworm art and the expressive effect of the spirit '*ziran*', physically and metaphorically?

To address all the above questions, this thesis adopts an anthropological perspective to comprehend Liang Shaoji's art and the intricacy of '*ziran*', a culture-bound concept

related to ecology and nature, re-constructed in Liang's creative practice. By interpreting his silkworm art as rituals under the theoretical framework on art and agency by anthropologist Alfred Gell, the study investigates the 'art nexus' between the artistic/ritualistic techniques of cultivating silkworms and making silk-involved artworks, with a focus on the functional role of the silkworm as the organism and the silk as the object. Based on multi-sited ethnographic fieldwork in China with the artist, silkworm farmers and sericultural scientists, I re-examine the material composition and symbolic articulation of '*ziran*' (natural, spontaneous, harmonious, 'so of itself', 'just how it is', non-assertive etc.) in Liang's silkworm art, which is often over-simplified as a Chinese Daoist-influenced egalitarian cosmology of nature or less-manipulative approach to animals by critics, as I will review in the following section. I will also assess theories in the anthropology of art, material culture and ritual study as the analytical tools to scrutinize Liang's semi-ritualistic silkworm art projects situated against the background of silkworm husbandry and silk culture in China.

Literature Review

Eco-art and Bio-art in Art History

There are two main critical approaches towards Liang Shaoji's art in the art history framework, placing his silkworm projects in either the theme-led category 'ecological art (sometimes 'eco-art') or the method-led 'biological art (also known as bio-art)'. In face of current environmental destruction and the anthropocentric paradigm (Demos 2016; Weinstraub 2012). As for the former, Weintraub's book (2012) offers a panoramic overview of ecological art. As a category that can be defined by artworks' strategies, issues and materials, ecological artists often deal with topics such as sustainability, climate change, biodiversity, mass extinction and catastrophism via methods such as paintings, video, sculpture, performance, social-engaged practice, digital art and design. Early exemplary works of this genre can be traced back to the 1960s when Hans Haacke's 'Grass Grows' (1967-69), for instance, transported a pile of soil with grass seeds and sprouts into the gallery as a mini-ecosystem. German conceptual artist Joseph Beuys is

another notable pioneer who in his performance work 'I Like America and America Likes Me' (1974) spent three days living with a live coyote in a confined gallery room as an innovative attempt to bring live animals into the art scene. His later work '7000 Oak Trees: City Forestation Instead of City Administration' (1982) more directly engaged with environmental issues when he proposed to plant 7000 oak trees in Kassel, Germany, with the help of volunteers.

Recent decades have witnessed more diverse artistic practice under ecological themes and art criticism towards these works has experienced an interdisciplinary trend where theories in social sciences and other humanities have been brought into the discourse of art history. Demos (2016), for example, focuses on the aesthetic and political engagement of ecological art in his monograph 'Decolonizing Nature: Contemporary Art and the Politics of Ecology'. The politics of ecology is concerned with the regional power asymmetry in globally distributing the costs and benefits of environmental exploitation, and consequential poverty, racism and neo-colonial violence. Demos follows this post-colonial commitment and critically reviews contemporary artworks' rhetorical strategies, visual construction, conceptual manoeuvres and affective effects in regard to eco-egalitarianism. Horton's (2017) offers a case study to re-examine the human-earth relations in marginalised Native North American art and activist practices. She points out the existing eco-art history genealogy fails to acknowledge the ecological rather than the cultural dimension of Native struggles and thus tries to create a dialogue between contemporary eco-aesthetics and indigenous practitioners' endeavours for land and justice (50). The approach of political ecology acknowledges the potential power of artistic intervention for environmental justice and thus, as Demos suggests, activist-artists should take more ecological commitments in their practices (2016). However, these analytical frameworks, however, are not fully applicable to projects that are less politically participative or socially engaged, instead of addressing more conceptual or aesthetic aims under the umbrella term of eco-art.

When it comes to biological art (or bio-art), this can be ecological when it tackles multispecies interaction, nature-culture dualism or symbiotic biosphere. As the human-nature relationship has been one of the major motifs in contemporary art, nonhumans

are familiar 'guests.' Animals and plants are commonly employed as conveyors of symbols in human narratives, such as metaphor, myth and folktale. They also serve as visual prototypes of images, either via direct representation or virtual parody. Bio-artists, however, seek a less exploitative and more egalitarian way to collaborate with other life forms. They make use of the processes of life, the developments of a micro-organism or the evolution of species to realise their projects (Baker 2000; Eisenman 2013; Jevbratt 2009; Kirksey and Helmerich 2010). The recent development of media and biotechnology parallels a material shift in the manipulation of non-human matters, where dead body parts, DNA, tissue and living species etc. are utilized by bio-artists to sculpt or mould uncanny living entities, often with the assistance of biologists (Stracey 2009). On a micro level, one stunning example is the GFP (green fluorescent protein) glowing bunny 'Alba' genetically modified by bio-artist Eduardo Kac in 2000. In Damien Hirst's exemplary 'Natural History' series sculptures, specimens of shark, sheep, cow and calf were preserved in formaldehyde in glass tanks, in which live animals had been killed, to present the disturbing intimacy between man and animal and fear of death (Eisenman 2013: 259). Such artworks reflect upon the uncomfortable and uncanny relational identities across species today when humans both 'kill and consume, protect and love' animals (ibid.: 260).

Meanwhile, as a scholarly response to the fast-developing biotechnologies against the background of structural inequalities and devastation of ecological systems, some critical theorists (often conveniently labelled as 'posthuman' for their anti-anthropocentric stance) have challenged the central position of the humanist ideal of 'mankind.' Instead, they have promoted new terms to capture the ambiguous liminality between flesh and machine, wetware and software, human and animals etc., thus hoping to eliminate the species hierarchy and eco-injustice penetrated both the discourse and practice (e.g. Barad 2003; Braidotti and Hlavajova 2018; MacCormack 2012). In regard to the nonhumans, the posthuman scope not only involves those unattended marginalised organisms beyond the human-centric realm, but also the 'technologically manufactured others' (Braidotti and Hlavajova 2018: 2). In Haraway's ground-breaking essay 'A Cyborg Manifesto' (1985, reprinted in 1991), the feminist sensitivity is mingled with sci-fi tones in the narrative of the 'cyborg' (blended from

'cybernetic organism') where the ideological boundaries become mutable and strict dualisms are dismantled. Similarly, Bennett's (2010) extension of the Deleuzian idea 'bodies without organs' to the geological level and argues that the earth is filled with vibrant matters and all entities on this planet are embodied with omnipresent but unnoticed vitality, as a way to demolish human exceptionalism. These posthuman theoretical lines converge upon their attempt to overcome unscrutinised dichotomies and their emphasis on unbounded relational ontology and continuous and contingent encounters (Braidotti 2018:8).

The thriving posthuman literature (e.g. Bennett 2010; Haraway 2008, Latour 2017) has been largely adopted as conceptual tools in the analysis of bio-art (Bakers 2013; Da Costa and Philip 2008; Kirksey and Helmerich 2014). In Isto's (2015) essay on Chinese artist Xu Bing's 'A Case Study of Transference' (1993-1994), for example, the research scope of 'biopower' (Wolfe 2013) has been employed to destabilize the subjectivity of animal bodies in the networks of capitalist production; by discussing how the pigs were crossbred before the stage and sold by the gallery, not as artworks but meat after the show, Isto pointedly argues that although pigs participated in the performance with a certain autonomy 'ultimately reveal to be only a function of relations of biopower' (2015: 202). However, the innovative vocabularies from critical theories, on the one hand, more accurately describe the messy hybrids or generative relations that have emerged in many ecological or biological art projects but they add little insight into the hermeneutic understanding of artworks themselves.

To evaluate artworks involving living organisms, whether silkworms or other animals, the existing eco-art framework in art history focuses on ecological themes in association with social, cultural, economic and political factors in each case, while bio-art criticism, besides looking at the final presentation, also examines the art-making processes between artists and nonhumans. Discussions on the backstage operations in bio-art projects tend to focus on the procedures regarding the ethics of art creation, especially animal rights or welfare (e.g. Baker 2000; Jevbratt 2009, Yang 2018), rather than how the ethical evaluation contribute to the meaning construction of the whole artwork. Moreover, as bio-artists play with the conceptual instabilities of life, body, autonomy

and nature etc. by tactically borrowing biotechnologies which are embedded in a homogeneous scientific discourse, there is a tendency for aesthetic and cultural particularities to become secondary, if not unremarked, in the appreciation of bio-art; this discursive hegemony might risk missing the nuances in non-scientific local contexts in artworks, although it is not the case in art critiques on Liang Shaoji (details see below). Before further examining how Liang Shaoji's silkworm art has been appreciated and interpreted as either bio-art or eco-art within art criticism's disciplinary framework, the following sections will first provide an overview of ecological art in contemporary China where Liang Shaoji's art can be culturally grounded, and then briefly explore the 'Chineseness', especially Chinese-specific 'ecological ideas' manifested in those artistic practice.

Ecological Art in Contemporary China

Chinese contemporary artists, like their non-Chinese peers around the globe, have expressed their concerns for environmental issues discursively, visually and affectively and have also offered innovative propositions and imaginaries of an inter-species symbiotic future. A special issue of the *Journal of Contemporary Chinese Art* edited by Zheng and Lee (2016) collected essays on East Asian ecological art practice, including painting, performance, documentaries, installations and socially engaged art. The editors summarize four reservoirs of ideas in the Anglophone academic literature on art and ecology, namely scientific studies, Western philosophy, indigenous cosmologies and climate change activism (e.g. in Demos 2013, 2016); hence they intend to add a fifth resource, East Asian thought, as a crucial anchoring point to explore eco-art in East Asia (216). Daoism *(*'The Way') featuring the relationality, cyclical pattern and immanent vitality in East Asian metaphysics (Perkins 2015 quoted in Zheng and Lee 2016: 217) has been emphasised as the underpinning of East Asian eco-art. Essays in this issue provide case studies of Chinese ecological art practice such as Xu Bing's educational 'Forest Project' (Wang 2016), Liang Shaoji's silkworm art (Zulueta 2016) and Gu Dexin's installations containing raw meat (Borgonjon 2016).

As only Huang's (2016) article in this collection figures activist art discussing two collective performances in China, 'Keepers of the Waters' (Chengdu, 1995) and

Everyone's East Lake (Wuhan, 2010), the editors notice the weak presence of activist art in East Asian contexts (e.g. Demos 2013, 2016). One main reason, as Zheng and Lee suggest, is because of the general weakness in 'civil society, the public sphere and rights-based activism' in East Asia and therefore the forms of activist practices in this region might not be easily recognised as 'activism' in terms of the Western standard used by art critics (2016: 219). However, Yang (2016) in her chronicle of Chinese ecological art since the 1990s provides a different observation and analysis where she argues that cultural factors such as the revival of traditional values in China have stirred ecological awareness with a nostalgic imagination of the unruined natural environment in the past. As Yang contends, with a primary focus on environmental well-being, the Chinese eco-art is characterised by grassroots environmentalism and activism as its major forms (ibid.). But as most Liang Shaoji's artworks with silkworms seldom show elements of activism regarding both Western and Chinese criteria (see more below), this thesis will not go deeper into this line of enquiry.

Nevertheless, it is worth noticing that despite the limited volume of literature delineating a holistic picture of eco-art in China, existing studies in art history alongside ecocriticism tend to emphasize Chinese particularities, namely cultural, religious, cosmological or ethical features in art projects from this region. Chu (2014; 2015), for example, investigates the aesthetic pastiche and parody of Chinese traditional landscape painting (*shanshui*) in contemporary visual art including animated cinema and experimental performance. Although Zheng and Lee implicitly admit that art from East Asia including China does not necessarily refer to East Asian metaphysics, they continue to argue for 'localness,' that is, the ecological thought exclusive to the region as an entry point of analysis as part of post-colonial commitments to build multiple discourses in eco-art criticism (2016: 219-220).

In broader discussions on the 'Chinese-ness' of Chinese contemporary art, it is contested whether art projects by Chinese artists are necessarily rooted in Chinese cultural tradition or as Tsao and Ames (2011) suggest, this may be 'yet another excellent example of cultural self-colonization' (xv). Artworks touching Chinese experience and issues or reflecting the artists' early training and fields of activities sometimes need to be

identified as 'Chinese', and with this label of 'otherness', they can gain recognition in the international art arena as an alternative of Western contemporary art (ibid.: xiii). Liu (2011) expresses similar worries that Chinese artists through the categorical designation of national identity are expected to represent a unified, often invented Chinese cultural tradition or past (Hobsbawn and Ranger 1983 in Liu 2011: 143) and this stereotype 'downplays their own diverse backgrounds' (144).

Regarding the global recognition of Chinese contemporary art, Tsao (2011) rejects the assumption that Chinese contemporary artists transform world art but instead regards them as being absorbed into Western art discourse and corporate values of the global art market. On the other hand, some scholars see more positive sides of the interculturality in Chinese artists, especially those diasporic examples such as Gu Wenda and Xu Bing who refuse to play a facile role of the cultural 'other' (Isto 2015; Liu 2011; Vinograd 2011). Vinograd (2011: 96) proposes critics should not overlook the culturally-based references but the international or transnational contexts those Chinese artists appear in are also worth exploring. These intercultural encounters, according to Isto (2015: 197), can shed light on how globalization exceeds issues of cultural communicability, especially when differences between human and nonhuman go beyond the national or cultural level in face of planetary ecological challenges. Isto hence applies posthuman theoretical tools by Cary Wolf and Timothy Morton to analyse Xu Bing and Gu Wenda's bio artworks (ibid.) rather than resorting to Eastern intellectual resources as Zheng and Lee insist (2016). Nevertheless, the controversy around regional specificity and universality in the study of Chinese contemporary art should be noted by eco-art criticism. When dealing with localness, interculturality and globalisation in ecological artworks, the cultural, geographical and religious qualities in a place are not to be ignored or reduced as 'otherness' and at the same time sensitivity to ecological concerns on a global scale can also be productive.

Returning to ecological thinking in Chinese eco-art, Zheng and Lee in their introductory essay present one of the keywords '*ziran*' in East Asian metaphysics, which is also the anchoring term in Liang Shaoji's silkworm art. Before examining how '*ziran*' as a culturally-specific ecological concept in Liang's artworks has been appreciated by critics,

the next sections will provide an overview of Chinese ecological cosmology as a background for further discussions.

'Ziran' in Chinese Contexts

In Zheng and Lee's (2016: 216) summary of East Asian metaphysics shown in artworks, '*ziran*' has been explicitly distinguished from 'nature' although the latter is mostly used as the former's English equivalence. The conception of 'nature' is based on the dualist premise dividing nature and culture, object and subject, bodies and thoughts, wild and domesticated etc., which has now been intensely criticized and deconstructed for those problematic dichotomies associated with it (e.g. Latour 2004; Morton 2007). Strathern (1980) for instance, acutely claims that the dichotomies in symbolic categories between gift and commodity, men and women, domestic and wild, and natural and cultural are not cross-culturally pervasive around the world with the ethnographic support in her analysis of the gift exchanging practice in Melanesian communities. '*Ziran*', on the other hand, can be literally translated as 'just how it is' (Zheng and Lee 2016: 217) or 'so of itself' (Jenkins 2002: 42). Different from nature as an environmental resource to be mastered, 'ziran' as a noun refers to an organic encompassing unity with the interdependent myriad things all-included, and as an adjective, it denotes the spontaneous, intrinsic, harmonious ways or patterns things naturally follow (Ames and Hall 2003; Jenkins 2002).

Chinese '*Ziran*' is one of the key notions in Daoist and Buddhist *Chan* (*j. Zen*) worldviews, which are often easily designated as Chinese, East Asian or even Eastern ecological thinking and the artist Liang Shaoji (2002; 2008) frequently resorts to in articulating his artistic inspirations. Although natural cosmology in Chinese traditions, if not in Chinese religions, is another rich field of scholarship, here a brief overview will help to contextualise '*ziran*' in the larger picture of Eastern worldviews characterised by enduring harmony, a holistic unity of humanity and cosmos, as well as unbroken continuity, productive correlations and balance among all internal life forces (Cheng 1976; Tsao and Ames 2011; Vachon 1983 in Jenkins 2002). Chinese traditional ecological wisdom encapsulates intellectual resources from Confucianism, Daoism and Buddhism, three bodies of doctrine which count as functionally equivalent to religions (Ching 1993)

or as systems of moral teachings on social behaviours (Bodde 1991, quoted in Jenkins 2002). Jenkins (2002) divides Chinese ecological worldviews into two kinds, one delineated in elite thought from these three doctrinal lineages and the other manifested in popular utilitarian practices.

'*Ziran*' is prevalent in Confucian 'anthropocosmic social ecology' (Tu 1998), where it serves as a moral force of universal orders on which human rationality and moral perfection are based; in an ideal state, humans should take their agrarian and social responsibilities to seek a harmonic balance between human order and universal order (Jenkins 2002). Buddhist Mahayana traditions in China emphasize cosmic inter-relatedness and teach ethical sensibility and responsibility to all sentient beings. The *Chan* sect, under a great influence of Daoism, proposes respect for '*ziran*' and an intuitional and less ascetic approach to enlightenment (Wilber 1981 quoted in Jenkins 2002). '*Ziran*' is most prominent in Daoist philosophy, which had long been pervasive in Chinese popular thought in ancient times as Needham argues (1956). Ames (2011), the English translator of the Daoist classic '*Daodejing*' and a comparative philosopher, summarises how Daoist philosophy prioritizes process and change over form and stasis, situation over agency, historia and mythos over logos, narrative over analysis, contingent and negotiated harmony over deterministic and necessary teleology, a dynamic radial centre over boundaries. Daoist processual ontology acknowledges continuity and diversity, but on the other hand, does not sustain a progressive view of history nor conservation of the status quo (Ames 2001). Thus, there are two keywords associated with the conception of '*ziran*' in Daoism, '*qi*' the immanent vitality in '*ziran*' and '*wu-wei*' the non-action principle towards '*ziran*', also interpreted as actions not violating universal orders to downplaying invasive human interventions (Needham 1956). This stance suggests Daoist ethics respect natural patterns in nature with limited human interference in practice (Ching 1993). But before examining how contemporary artworks borrow, appropriate or refer to this intellectual heritage, it should be noted that religious, textual and institutional Confucian, Buddhist and Daoist teachings on ecology should not be equated to popular, grassroots and secular beliefs in ancient and contemporary China, which are more characterised by concerns for utilitarian efficacy as well as 'this-worldly' prosperity and immediate happiness (Jenkins 2002).

An unresolved contradiction of Chinese ecological thought lies in the disconnect between an idealised worldview and the actual situation. As Jenkins (2002: 47) points out, even though Chinese environmental ethics towards '*ziran*' worships reverence, compassion and stewardship, it failed to effectively halt environmental degradation and an ecological crisis in modern China and thus becomes a ongoing issue how to effectively exert practical influence in academia, in public policy-making and the private sphere. Nonetheless, contemporary artists have certainly turned to natural cosmologies of ancient China when touching upon ecological issues, making conceptual innovation and reflection (if not necessarily practical action) especially in artworks that take non-activist approaches (e.g. Chu 2014).

However, critics should bear in mind that the danger of resorting to 'tradition' even at a discursive and speculative level, is that traditions can be invented or reinvented. In Liu's (2011) critique of Xu Bing's installation '*Where Does the Dust Itself Collect?*' (2004), for example, the title is excerpted from a Buddhist *Chan* proverb but Liu cautiously scrutinizes whether the *Chan* idea Xu Bing adopts is decidedly Chinese variation on an antique Indian philosophy or a thin, popular and Westernized version of the sect. Although authentic allusion to an original or ancient ecological doctrines is definitely not a golden criterion for good artwork, a probe into which version of ancient thought artists have referred to, as well as how they appropriate it and why they choose to do so allows for a more accurate analysis of their artworks, and more importantly, helps to judge whether a work plays a hollow, superficial and airy transposition of concepts or instead brings genuine fresh insights to the art world or broader contexts.

Liang Shaoji in Art Criticism

Although Liang Shaoji is not an expatriate Chinese artist like Cai Guoqiang, Huang Yongpin, Ai Weiwei and Xu Bing, the 'interculturality' of these artists (Isto 2015; Liu 2011; Vinograd 2011) is also manifested in Liang's personal experience and artistic creation. As the artist (2017) recalls, he studied at the Affiliated High School to China Academy of Art until 1965, an institution founded by pioneering Modern Chinese painter Lin

Fengmian where Liang was exposed to and attracted by German expressionist art even though Soviet realism was dominant in art education due to the ideology in China at that time. The start of the Cultural Revolution in 1966 halted university enrolments nationwide and dashed Liang's ambition to study sculpture. Liang then was assigned to work as a fabric designer in a craft factory in Taizhou city in Zhejiang Province, which was one of the largest producers of woven products for the export market at that time. This practical experience equipped Liang with solid knowledge and sensitivity to various materials which later also fostered his silkworm art creations in middle age.

In the 1970s and the early 80s, Liang was appointed as director of the government-founded Institute of Arts and Crafts of Taizhou and also worked at the Overseas Exhibition Office of the Light Industry Department of the Beijing Government for more than two years. These occupations allowed him to experiment with textile art and fabrics to gain experience in curating in large exhibition spaces and most importantly, to travel abroad on official business and visit galleries in Germany, France, the USA and the former USSR, when postmodern art in the West was still in its heyday. In Zulueta's view (2016: 382), these trips to foreign countries and the regained access to books of Western writers (Liang himself has frequently cited and quoted Nietzsche, Heidegger and Agamben) enlightened the artist to critically think about the constraints upon Chinese society and himself as an individual after the Cultural Revolution.

It was a serendipitous opportunity that drove Liang Shaoji's career from arts-and-craft design in fabric art to contemporary art in his forties. In 1986, Liang enrolled at the Varbanov Institute of Tapestry at the China Academy of Art in Hangzhou, Zhejiang mentored by the Bulgarian painter and tapestriest Marin Varbanov (1932-1989) known for his soft sculptures consisting of wool, silk and bamboo textiles. Liang Shaoji's hands-on training and experience in soft sculpture and craft there during the late 1980s deepened his mastery of various materials such as hemp, stone, seaweed and glass (Liang 1994). When Liang's artistic interest later narrowed down to silk and silkworms, his probe into '*ziran*' still revolved around the spirituality of materials. The installation 'Yi Series No.1: Magic Cube' (1988) heralded more than thirty years of silkworm art creation (fig. 2) composed of artificial silk, cocoons, paper, linen, bamboo and metal

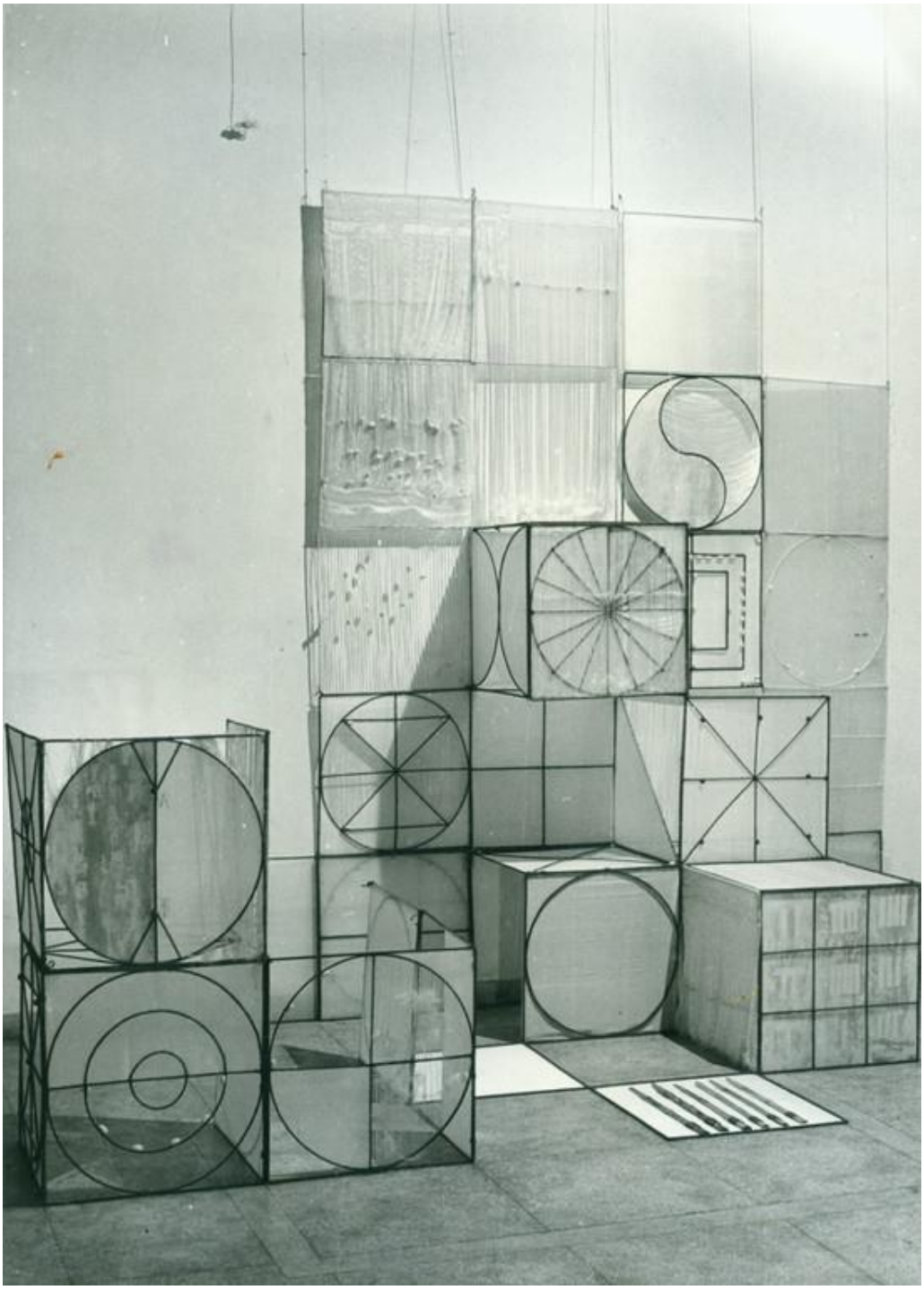

Figure 2: 'Magic Cube / Yi Series No.1', 1988 (Photo: ShanghART Gallery)

frames. In February 1989, 'Magic Cube' was exhibited at 'China/Avant-Garde Art Exhibition' in the National Art Museum of China in Beijing; a few months later the Tiananmen Square protests and massacre took place.

Chinese contemporary art emerged in the global art world as a category in the early 1980s when the Start Group anticipated the art movement 'New Wave of 1985' as a direct

Figure 3: 'Nature Series No. 1', 1989 (Photo: ShanghART Gallery)

response to then social protests and political censorship of art works (Tsao 2011: 2). It was after the Opening of China policy initiated in 1978 that artists were able to draw on Western literary, semiotic and cultural theories in their art making (Vinograd 2011). However, the post-Tiananmen era saw a shift in Chinese contemporary art world towards postmodern parodies of Maoist propaganda in domestic art scenes. Meanwhile cutting-edge artists in exile tended to strategically juxtapose multi-cultural elements to mainly non-Chinese audiences to gain tremendous fame in contemporary art market, which Bhabha criticises as showing a spurious posture of 'internationalism' as those expatriate Chinese artists live in 'the nations of others' (2002: 30).

After the 'China/Avant-Garde Art Exhibition' in 1989, Liang Shaoji stayed in China to continue his career as a contemporary artist. His 'Nature Series' started with an installation simply named 'No. 1' (1989) with loops of barbed wires in the shape of a globe entangled with several ellipsoidal cocoons when the artist was yet inexperienced with the 'flat cocoon' technique employed in his later work (fig. 3). Liang spent nearly ten years since then raising silkworms with village farmers in a suburb of Linhai County

in Zhejiang and learning from sericultural experts in the then Zhejiang Agriculture University (merged into Zhejiang University in 1998). As the artist himself articulates (in Yang 2018), his initial artistic vision was to have silkworms secreting silk on metal planes as a metaphor for the ongoing transformation of China from a pre-modern agrarian society to a modern industrial information one. As he became familiar with the physiological characteristics of the silkworm and sericultural methods, Liang gained more insight upon the collaborative potentials between art and science and determined to make silkworm-art as his life-long art experiment.

Liang Shaoji is not the only Chinese contemporary artist to create art with silkworms. Established artist Xu Bing has made 'American Silkworm Series' since 1994 containing four installations where silkworms spun threads on objects such as a dictionary, Kafka's book 'The Metamorphosis' or a VCR player, as a reflection on materially expressed natural language and human language filled with cultural identities (Vinograd 2011: 110). More recently, Vivian Xu a media artist combines the capacity of the silkworm and cybernetic devices to build up a silk machine with biological and the computational logics entangled (2019). However, only Liang has spent nearly thirty years maintaining a long and deep relationship with silkworms since the 1990s and keep exploring the '*ziran*' motif throughout his art career.

Gaining more biological knowledge on silkworms over the years, Liang finished his early work 'Beds / Nature Series No. 10' in 1993, an installation which was later exhibited at the 48th Venice Biennale in 1999 where silkworms managed to secrete silk threads in the form of the flat cocoon and wrap charred engine coils in bed-frame shape. The flat-cocoon technique requires the silkworms to secrete silk filaments on two-dimensional flat planes as thin flakes rather than spinning commonly seen oval-shaped cocoons. The dominant compositional grammar of flat silk flakes covering objects in his silkworm art appear wholly in his later installations such as fossilized wood pieces dating back to the Tang Dynasty in '*Heavy Clouds*' (2014-2018) (fig. 4) and victim miners' helmets and headlights in '*Helmets / Nature Series No. 102*' (2004), (fig. 5)or partly in performances such as silk-wrapped naked female bodies in '*Self-roped / Nature Series No. 31*' (2000) and mirrors in the performance '*Cloud Mirror / Nature Series No. 101*' (2007). Other

Figure 5: 'Heavy Clouds', 2014-2018 (Photo: XU Feixuan, 2018)

Figure 4: 'Helmets / Nature Series No. 102', 2004 (Photo: ShanghART Gallery)

projects going beyond the prominent flat-cocoon technique in Liang Shaoji's silkworm art include the installation '*Broken Landscape*' (2016) where the lifespan of numerous silkworms was spent and recorded on a long yellowish rectangular piece of silk fabric and the insects dispersed their faeces, urine and eggs on the textile whose physical traces are kept in their original forms as little black dots and pale brown marks. Meanwhile, in the performance '*Listening to the Silkworm / Nature Series No. 96'* (2006), a sound art installation invited the audience in the gallery to wear headphones and listen to the voice recordings of silkworms' chewing mulberry leaves and also spinning silk filaments.

Art critics have tended to conclude that Liang Shaoji's silkworm art expresses the artist's philosophical contemplation and social concerns, which outshines the aesthetic value and decorative manoeuvre in his practice. By juxtaposing soft raw silk and metal or plastic daily objects as the conveyors of metaphorical analogies, the artist is said to create a confrontational tension between environmental catastrophe and progress and development (Gladston 2011; Yang 2018). In particular, Liang's works deal with the uneasiness between the idealistic premodern nature and the excess of accelerated

industrialisation (von Drathen 2011; Xia 2015; Zulueta 2016), as well as individual freedom and institutional violence during social upheavals, namely in the '*Self-roped*' performance (von Drathen 2011; Xia 2017). On a more metaphysical level, as the award committee report of the Prince Claus Awards (2019) suggests, Liang's artworks create evocative meditations on nature and human existence and offer an investigation into the ethics of the human relationship with nature.

Most scholars and critics tend to attribute the presentation of '*ziran*' and its associated worldview in Liang's oeuvre to a Chinese-specific, Daoist-influenced and Eastern aesthetic of ecology, as frequently claimed by the artist in interviews and his own published notes (e.g. Brouwer 2007; Liang 1994, 2002; Xia 2015, 2017; von Drathen 2011; Yang 2017, 2018). The ecological aesthetics manifested in Liang's silkworm art conceptualises nature as an all-encompassing unity (Brouwer 2007), with the worship of ethereal and ambiguous art expression (Xia 2017: 61), and the embrace of the continuity between humanity and the divine nature (also known as '*tian-ren-he-yi*') (von Drathen 2011) in line with the broad exposition of Eastern Daoist natural cosmology discussed in the previous section. However, one obvious problem with these aesthetic analyses is that the interpretation of Daoism-flavoured '*ziran*' as 'nature' in English ignores the polysemy of '*ziran*' in its original cultural contexts, such as the aspect of spontaneity in this concept. On this premise, the aesthetic characteristics in Liang's works as declared by these critics appear logically loose, haphazard and superficial, and moreover, fail to explore the tensions between ancient intellectual sources and contemporary appropriations in Liang's case.

As a notable exception, Yang's two essays on Liang Shaoji (2017; 2018) also discuss '*ziran*' as the essential motif in his silkworm works but acknowledge the non-assertive, spontaneous and harmonious connotations of this term. Liang's approach to working with silkworms, as Yang (2017) argues, is causing no harm and rather meditative, as opposed to the anthropocentric manipulating orientation towards animals in Western bio-art. Although silkworm domestication and husbandry embody human control and transformation of nature, Yang (2018: 125-126) suggests that Liang's art practice, under the help of sericultural experts have followed '*ziran*', namely the behavioural pattern

silkworms intrinsically follow since the artist has minimised human intrusion in the art-making processes as the Daoist mantra 'non-action' (*wuwei*) encourages. Yang concludes that Liang's silkworm projects show an Eastern-style dialogue between human and '*ziran*' in contemporary contexts where his interactions with silkworms are in accordance with the natural laws of the universe. This follows another Daoist principle '*wu-wu-gui-jian*' (no hierarchy among the myriad of things) and suggests that Liang's works reflect his deep compassion and respect for non-human life (ibid.). It is therefore plausible in Yang's view to unpack '*ziran*' in its rich Daoist grounding when viewing Liang's artworks in terms of ethics rather than aesthetics.

Nevertheless, Yang's assertion of the non-intrusiveness in Liang's use of silkworms, which serves as the foundation of her subsequent reasoning on Chinese-specific Daoist ecological ethics, is not firmly supported by facts about how the artist has worked with silkworms in reality (see below). On the other hand, despite Yang's concern with the art-making process, especially the trans-species morality underlying bio-art literature (e.g. Baker 2000; Jevbratt 2009), her ethical considerations concentrate mostly on the artist and thus to some extent are disconnected from the symbolic, functional and affective analyses of his finalised artworks. In Liang's case, the separation of ethical considerations and meaning in a contemporary art criticism can lead to a lack of accurate understanding of his silkworm art, as I will delineate in later chapters.

Other than '*ziran*' as a culture-embedded concept in Liang Shaoji's art from eco-aesthetic and eco-ethical perspectives, some art critics have expanded their analytical scope to the Chineseness in Liang's projects beyond Chinese ecological thinking (e.g. Gladston 2011; Cheng 2007; 2015). According to Liang's own statements, he cautiously keeps a distance from the 'silk road' discourse infused with Chinese official ideology and rejects the assumption that he intentionally manipulates Chinese cultural symbols (quoted in Yang 2017), even if silk and silkworms dominate his artistic work and despite acknowledging the long-standing Chinese material culture of silk and ancient literati paintings have enriched the cultural, aesthetic and linguistic connotations in his art. Indeed, homophonic Chinese characters, for example, have been frequently employed by Liang (2008; 2013) to elucidate his projects, such as playing with words under similar

pronunciation '*can*/*chan*' - silkworm (蚕), Buddhist Zen (禅), the sound of flowing water (潺) and being broken (残) when explaining the installation 'Broken Landscape' and the video work 'Illusion of Flow'. Cheng therefore regards Liang's deliberate choice of the domestic silkworm as expressing 'his filial piety to his fatherland' and furthermore, 'an attitude consonant with China's post–Cultural Revolution nationalism and the more traditional Confucian morality' (2007: 69). With such 'sino-centric sentiments', as Cheng suggests, Liang aims to create an artistic language to establish a new 'Silk Road'.

Gladston (2011) also focuses on Liang's Chinese cultural identity but associates Liang's semi-retreating lifestyle in Tiantai County away from cities and his use of natural silk as an echo of the literati in ancient China, who chose a country lifestyle away from the political centre as an expression of disillusionment with the regime or dissatisfaction with their career as officials in state government. The unsettled relationship between order and disorder in Liang's art, as Gladston contends, is an implicit dissent to the drastic political and social turbulence in the late twentieth century undergoing in China under the rule of the Chinese Communist Party. In Liang's conversation with Gladston (2011), the artist, too, implied that Daoism as part of the Chinese intellectual tradition, cannot be completely separated from Confucianism, but have been mutually integrated and protected and therefore it was almost impossible to use Daoism solely to break with the existing social constraints in China. In the May Fourth Movement, Liang recalls how Chinese intellectuals borrowed Western resources to break with tradition which in a parallel manner, he incorporated Nietzsche's philosophy in his work. In this sense, the anti-totalitarian stance in his 'Nature Series' has not been fully appreciated in the artist's own view.

A less culturally-bounded approach to Liang Shaoji's silkworm art is to concentrate on the participating roles of the silkworm and the silk fibre or the morality of trans-species collaboration but in the analytical framework of bio-art (e.g. Fok 2012; von Drathen 2011; Zulueta 2016). In Fok's (2012: 99) overview of contemporary Chinese art involving animals, various species function as effective tools to replace or collaborate with humans in order to present socio-cultural issues or life-death motifs in art.

Performances by some Chinese artists such as Yu Ji's '*Pet's Kiss*' and Huang Yongping's '*Theater of the World*', as Yang (2017) suggests, are ethically problematic in terms of these artists' instrumental and anthropocentric control and manipulation of live animals. In these terms, although it is contested whether Liang's ways of working with silkworms are free of cruelty as Yang suggests (ibid.), some critics notice the degree of active agency of either the spinning silkworms or of the inorganic silk threads in Liang's artworks (e.g. Cheng 2015; von Drathen 2011; Zulueta 2016). According to Cheng (2015; 2017), the artist's creative agency works with the silkworms' agency to live and evolve, thus collaborating in the art-making processes across species boundaries using cocoons filled with life and significance.

Meanwhile, Zulueta (2016: 385) is more concerned with the conceptual expression of Liang's oeuvre and interprets his artistic project as advocating empathy and respect for non-human agencies such as the silkworms' as the basis to reflect upon globalization and reconstruct identities and cultures. By referring to the field of animal study which encourages treating animals as beings with their own agencies, interests and experience (Shapiro 2002: 332, quoted in Zulueta ibid.: 378), Zulueta proposes to distinguish animals' biology and perspectives from the representations humans have projected onto them. In Liang's case, Zulueta notes that the artist has underlined both the agency of silkworms and the 'human/silkworm coevolution' and the entailed 'blending of nature and culture' in a shared history (ibid.: 384). However, these broad examinations of the artistic contributions by agentive silkworms or silk filaments in Liang's art projects share a common deficiency that agency in the critics' reasoning has not been clearly defined and remains under-analysed. For instance, it is vague whether the agency is conferred to or inferred in the animal or the material, and moreover, the subject of agency also tends to change from silkworm to silk and sometimes even to the noun 'nature'. The arbitrary distribution of agency is evident in statements such as 'nature […] act[s] as the artist' (von Drathen 2011) and 'the egg-shaped cocoon is […] filled with vitality and meaning' (Cheng 2007: 69). As these scholars offer no further elucidation to clarify vitality or agency in certain theoretical frameworks, it is thus almost impossible to evaluate and relate their claims to other literature.

To briefly summarize, existing scholarship on both contemporary eco-art and bio-art shows a conspicuous interdisciplinary trend where art critics turn to political ecology, posthuman critical theory, regional studies, animal behaviour, biology and anthropology etc. for new research scopes and analytical tools. Studies of Liang Shaoji's silkworm artworks have explored the aesthetic, conceptual, ethical and cosmological aspects of both the art-making procedures and artworks' final presentations. Although the categorisation of artists or artworks is only a tentative exercise to facilitate discussion and parallel comparisons, critics with more concern for the ecological aesthetics and ethics delivered in Liang's works have tended to stress '*ziran*' or natural cosmology in a Chinese or East Asian context, despite the concept too often being reduced to 'nature' in English and detached from its original Daoist flavour. Trans-species morality in artists' working processes with other organisms is also the focus of bio-art critics' attention, where they tend to use Anglophone conceptual tools from posthuman theories such as agency rather than East Asian philosophy as an intellectual resource.

Similarly, as bio-art as a category intrinsically suggests an interdisciplinary collaboration between art and biology, scholars who analyse Liang's approach to silkworms within the scope of bio-art refer only on the artist's consultation with silkworm biologists but ignore the collaborative processes between Liang and silkworm farmers, thus missing the larger context of Chinese sericultural production behind his oeuvre. Current art critiques of Liang Shaoji remain uninformed about how his interdisciplinary or trans-species collaborations occur, with the result that any elucidation of '*ziran*' or 'agency' in his artworks lacks detailed support. In the scope of contemporary art criticism, the symbolic connotation, aesthetic presentation and ethical evaluation of Liang's art works overshadow his artistic technique and the efficacy of his projects. This thesis hence turns to analytical frameworks in anthropology to better understand the interactive relations among the silk, silkworms, the artist and the audience, whose processual entanglements are believed to dictate the meaning of '*ziran*' in Liang's art, as this thesis will mainly demonstrate.

Theoretical Framework: An Anthropological Approach

Art in Anthropology

Art criticism and anthropology used to be quite distinct. Indeed, contemporary art can still be thought of as the opposite pole to the now obsolete category of 'primitive art' (sometimes 'aboriginal art') which used to be the main subject of anthropological studies in this area (Firth 1992). As such, art traditions in non-Western small-scale societies were assimilated into a 'monolithic and evolutionary scheme' of Western art history (Layton 1991: 2) under the label 'primitive' in early ethnographic accounts and exhibited internationally in art institutions serving for joy or edification of privileged spectators (Ingold 2013). Morphy and Perkins (2006: 5) point out the term 'primitive' in the Western discourse of art implied the stereotype of being childish and irrational with 'the primaeval psychic energy of man'. However, as Layton's (1992) comparative study of two aboriginal communities in Australia notes, local artists have responded rather differently to the global art market by incorporating foreign patterns and motifs into traditional rock art design, therefore, challenging the category of aboriginal or primitive art. Meanwhile, art has been increasingly inserted into the space between indigenous communities and the developed world through tourism, cinema, exhibitions and the market for craft products thus providing a new sphere of cross-cultural interaction and exchange of values (Morphy 2013). So, although terms such as 'primitive art' and 'aboriginal art' have been cautiously discarded and criticised in anthropological studies of art for their ethnocentric colonialist stance (e.g. Anderson 1979, Layton 1991), 'art' itself as a category remains unstable and contested in anthropology.

The concept 'art', as originated in western traditions, encompasses aesthetics and communication as two sets of values (Layton 1991). In art history, as Morphy (2013) summarizes, objects can be counted as art either because they are institutionally acknowledged as repositories of values for both international academia and the art market, or because they occupy some aesthetic or interpretative properties, or even because the artists intend to make them as art. However, none of these criteria are fully suited to cross-cultural application in anthropological studies of art. Anthropologists explore art objects and practices in a given cultural context during both daily activities

and special occasions such as rituals and ceremonies, where the category 'art' differs from most other classifications of artefacts in that there are no minimum functional (e.g. boat or headdress) or material (e.g. pottery) criteria that would exclude things from being 'art objects' (Ingold 2013). Apart from examining iconographic and aesthetic properties such as artistic form and style as art historians do (e.g. Layton 1991), anthropologists concentrate on sensory and functional aspects of art objects or processes, such as for presentational or representational purposes (Morphy 2013: 655). Anthropological studies of art have shown the entangled relationships between worldviews and everyday life with exemplary cases in non-Western societies ranging from body art (Gow 1999), hunting traps (Taussig 1993), decorated canoes for sailing (Munn 1977), wood carvings denoting the growth of humans (Fortis 2010) and tools for mortuary rituals (Küchler 2002). The research scope of anthropology foregrounds art as an experiential category and thus destablizes the previously conventional distinction between art and artefacts by questioning how the ways of making objects, perceiving the environment and knowing the world connect together through the lens of art. Anthropology also provides analytical tools to study art as mediator among humans, non-humans and the landscapes in specific cultures and thereby complicate established ethnocentric notions such as ecology, materiality, skill, personhood and sociality (see below).

Though art objects in small-scale communities have long been the primary focus in this discipline as an attempt to 'provincialize art history' (Kisin & Myers 2019: 238), there have also been anthropological studies on contemporary art and folk art with more focus on the social, cultural and economic matrices of art production and circulation among the theoretical tides of postmodernism, decolonization and globalization emerging from the mid-1980s (e.g. Kisin & Myers 2019; Marcus & Myers 1995; Steiner 1994; Schneider 2017). Art has been entwined into processes of cultural identity constructions, copyright and cultural heritage legislation and local or global political activism in contemporary societies (Morphy 2013), and on the other hand, has initiated more trans-disciplinary collaborations in academia. The art exhibition with a published book 'Multispecies Salon', for example, is a pioneering curatorial project on cross-species encounters in the convergence of contemporary art practice, bio-science and

anthropology, where the boundary between making art and doing ethnography becomes blurred in both practice and theorization (Kirksey 2014). In the expanding scope of art, conversations between art and anthropology take multiple forms and directions. Artists might conduct fieldwork as critical art practice while scholars draw on anthropological theories to unpack how art initiates and mediates social relations among people and things.

Hence it will be more adequate to employ anthropological theories rather than art criticism into the evaluation of '*ziran*' cosmology in Liang Shaoji's silkworm projects as a cross-cultural study of art. Liang's silkworm artworks deploy silkworms, human beings and various materials (as many ritual art practitioners do) for certain functional purposes rather than only as semiotic and aesthetic expression. Meanwhile, Liang's projects challenge the conventional division of performance and installation as art forms in contemporary art criticism especially as the processes of completing installations with silkworms are not only result-oriented, but the processes themselves are arguably a meaningful artistic performance. In this sense, the entanglement of the human artist and audience, silkworms, silk and other materials touches upon the central concerns for notions such as agency, cosmology, materiality, skill and efficacy as well as the questionable dichotomies such as objects and organisms, nature and culture etc. in the theoretical framework of anthropology.

Anthropology of Art: Main Theoretical Approaches

Art entered the mainstream of anthropology, as noted above, with two theoretical trends. Material culture studies were pursued in line with culturally oriented archaeology (e.g. Miller 1985; Morphy 2013) and, on the other hand, structuralist approaches influenced by semiotic linguistics (e.g. Leach 1973; Turner 1967) examined aesthetic, iconographic and functional aspects of art (Morphy 2013: 655). Aesthetical pleaure as a distinct feature of art for anthropological studies was proposed by Firth, who asserts that arranging elements of experience, imagination and emotion in art is to evoke feelings and emotions as aesthetic effects. The sensory perception and judgement of these effects are cross-culturally homogeneous, although different social conditions and artistic traditions might influence the way to curate 'harmony, rhythm and

symmetry' (1951: 156). Boas (1955: 25) holds a similar stance in his book 'Primitive Art' where he presents prehistoric and modern art examples to claim the 'regularity of form and evenness of surface' are universally acclaimed decorative effects, with symmetry, rhythm and the emphasis on the form being fundamental traits in the aesthetic impulse shared by all human beings. However, the assumption that there exists universal taste, impulse or sensuous perception of aesthetic effect has been challenged by some ethnographic evidence where the mentioned aesthetic values were not necessarily considered or cannot serve as the criteria to judge the quality of an art object within local communities. In Morphy's analysis of Yolngu paintings in northern Australia, for example, the notion of '*bir'yun*' (brilliance) denotes 'a shimmering quality of light which engenders an emotional response' which, at first glance, is similar to the Western idea of 'aesthetics' (1992: 331). Nevertheless, this particular effect in Yolngu people's perception is not enacted by the visual features of those paintings but instead is endowed by ancestral power with those artworks' brilliant contents and forms (ibid.: 332). Morphy (2013: 672) hence argues that the anthropological approach towards art should examine the aesthetic properties of art objects to interpret art forms, including physical traits such as shape, texture, smell and compositional details and also non-material attributes such as age, distance or magical efficacy. When those effects on senses are incorporated into culturally-specific value systems, the sensory effects of artworks are considered 'aesthetic' and are then interpreted and appreciated positively or negatively based on certain evaluation criteria which should not be viewed as identical in diverse cultural situations (ibid.).

Besides the presentational qualities of art due to aesthetic traits, anthropologists have also explored the representational significance of art. Boas, who was more concerned with art's aesthetic properties, also paid attention to the combination of meaning and forms as they can 'recall past experiences or [...] act as symbols' and hence contribute to the aesthetic effect of art by 'elevating the mind above the indifferent emotional state of everyday life' (1955: 12). Beyond the iconographic analysis of graphic designs in art criticism, anthropologists in the structuralist tradition (Lévi-Strauss 1966) were particularly interested in how meanings are encoded and organised in symbols and forms through everyday social processes where art objects function as codes for

experience, thus serving as a communicative system with semantic properties in given societies (e.g. Forge 1967; Munn 1973). One important anthropological question, as Munn (1973) notes, is not to ask what art designs signify but how they obtain their signification in the ongoing socio-cultural dynamics. In her formal analysis of Walbiri art as an ordering system of interpersonal relationships, motifs painted on Walbiri women's bodies are, for instance, collective representations of ancestral heroes embodied with stratified prestige and power during rituals.

The semantic or communicative features of art are often manifested in anthropological studies of exchange, myth, magic, ritual and religion. Radcliffe-Brown (1964) as a functionalist, for instance, studied the role of emotions evoked by dances in Andamanese rituals and their social functions; Kuchler (1992), too, places art as a vehicle of meanings in its functional contexts, observing how the wooden artefacts in Malangan society are viewed as containers for the life force of a deceased clan member in rituals (1992). Horton (1965) also emphasizes the functional effect in Kalabari people's evaluation of handmade sculptures as the 'house' and representation of spiritual forces. A more extreme non-aesthetic principle in judging art objects can be seen in Forge's (1967) research on Abelam cult house paintings in New Guinea, where the only criterion for good artworks is their effectiveness in rituals, with crucial indicators such as the quality of the yams grown in the gardens. As the above examples show, people can appreciate art objects in terms of their pragmatic and semantic values embedded in rituals and performances where the enchanting efficacy of admired artworks is not purely a result of their sensory (or aesthetic) characteristics. The effectiveness of art can be central in the interpretation of religious, shamanistic or ritual events, but art often 'appropriates [its] function' today as the functional aspect is always auxiliary for the hermeneutic purposes (Morphy 2013: 650). The functional properties can be relevant to the meaning of artworks but are never the main reason for including it in the art category. In the contemporary art world, more especially, one of art's functions is as a semi-commodity to mark values, which has little to do with the understanding of the artwork itself. A more radical theoretical pathway to analyse art's efficacy in social relations, which is less tightly attached to the symbolic aspects of an artwork, has been

proposed by British anthropologist Alfred Gell (1992; 1998) in his action-centred theory of art as delineated below.

Art, Agency and Technique

Gell (1992) takes a strong anti-aesthetics stance in his essay '*The Technology of Enchantment and the Enchantment of Technology*' where he opposes the religious attitude towards sacred art and instead proposed atheism in the anthropological approach to art, with indifference to aesthetic values. Anthropologists should concentrate on 'the [art] object as an object', regarding it as a social being rather than a carrier of symbols or a beautiful thing, and instead scrutinize how this physical entity works to 'cast a spell over' a person both in art production and social processes (1992: 43). Unpacking the ethnographic details of Trobriand canoe handicraft, Gell contends that the complex and bright designs of canoe prows can captivate the viewers and motivate them to offer more valuable goods than intended in Kula exchange rituals. As he notes, art as a 'technical system' demonstrates 'a certain technically achieved level of excellence' (ibid.); this proficiency in skill guarantees the magic and technical efficacy of art in rituals and other ceremonial and commercial exchanges, whose social functions are enacted by mediating and creating social relations between the artist and the audience.

Gell's posthumously published book '*Art and Agency*' provides a more systematic theory to analyse art objects as distributed agents in social relations during the processes of 'art production, circulation and reception', rather than an isolated 'evaluation of particular works' (1998: 2). Following British social anthropology's traditional focus on social relationships, Gell (1998: 7) refutes an aesthetic approach towards art instead placing it in its social contexts; in this way, no prior definition of art is needed to satisfy aestheticians, philosophers or art historians, because the intrinsic nature of art lies in its relations with others. In Gell's theoretical framework, art becomes a system of actions with the capacity to make change instead of a complex of encoded symbols about the world. The essence of an art object, in this scope, is its function of 'the social-relational matrix in which it is embedded' (ibid.). Gell hence develops a new theory of art to replace symbolic communication with more emphasis on 'agency, intention, causation,

result, and transformation' (1998: 6). Before examining how Gell's formula investigates art objects as the 'index of agency' to function in social relations, I will briefly introduce how notions of 'agency' and 'index' are framed in his theory.

'Index' in Gell's art theory draws on semiotic theory by Charles Peirce (1955) on a triad of signs, namely icon, index and symbol. An *icon* is a sign with physical resemblance with the object mostly based on visual or other experiential registers (a photograph of a flower or a realist sculpture of a cat, for example, can be the icon of its prototype.) Within this provisional division, examining icons in art can be regarded as the field of aesthetics. Meanwhile, a *symbol* is mostly recognised by cultural convention where the symbolic sign is arbitrarily associated with the object it signifies. Written words in languages are mostly symbols, as suggested in Saussurean linguistics, since the linkage between signs and meanings are established and learnt in given cultures. In iconographical study of art, art objects are read as language-like signs with encoded meaning for communicative purposes by some structuralist anthropologists as discussed above. As for *index*, the relationship between an indexical sign and the object is referent and continuous, when the index is modified or affected by the prototype and thus it can be an natural evidence of the object. Smoke, for example, can be the index of fire and a footprint the index of a foot (Peirce 1955). Gell is particularly concerned with the naturalness in an index, as from this kind of natural sign 'the observer can make a causal inference about the intentions or capabilities' behind the index without referring to linguistic models of interpretation (1998: 13).

This intention or capability leads to the second keyword in Gell's theoretical formula, namely, 'agency'. The term provides an analytical tool to examine the dynamic relationship between social structure and individuality, exploring the capacities, strategies, creativity and imagination of the individual as agent limited by and recreating the structural constraints and the social repertoire of roles and positions (e.g. Bourdieu 1977; Turner 1982; Rapport 1990). In Gell's (1998: 13) framework, art objects are anthropomorphised as agents, whose agency is granted by inference in relation to people's intentionality behind the art. An agentive artwork can cast an influence upon others cognitively in the vicinity of the object itself, with the distributed agency from

the artist. It will be helpful here to compare agency in Gell's art theory and agency in vital materialist theories such as Latour's (1999). Although both Gell (1998) and Latour (1999) aim to render agency to non-organic things in the web of relations, in Latour's actor-network-theory, human and non-humans with agency as an inherent property in his newly-constructed cosmological framework together mobilize and mediate set of practices in nested actions (1999: 181). Agency that art objects have in Gell's (1998: 20) non-ontological formulation is only inferred as embedded human artists' agency.

Gell (1998) thus invents a four-term model to examine the agent-patient 'art nexus' among the main players during the art object's 'social life' in its cultural environment. The four parties in Gell's formula of an 'art nexus' are the artist as agent, the prototype of the artwork, art object as index with extended secondary agency, and the recipient as spectator or as patron. The art object performs as the 'index' of agency because it can point to the social agency just as smoke points to the fire. In the simplest situation, an artwork as an index of agency captivates the viewers (i.e. recipients) to make non-linguistic inferences about the social agency of the artist. In Gell's term, this 'abduction' (Eco 1976 quoted in Gell 1998: 14) of the agency is a cognitive process to find inferred intentionality rather than causal chains when people naturally make and adopt suppositions that there must have been some social agency behind an effect. Art index thus triggers a cognitive interpretation about the distributed agency of human agents and plays 'the practical mediatory role in the social processes' (ibid.: 6). Gell notes that the exertion of agency can be reciprocal among the four players in 'art nexus' (fig. 6), when the viewers of art objects, for example, can be influenced as pure audience but might also instruct an artists' action as their patrons. The artists with skill, wit or even magical powers use their creative acts to shape the art objects and extend their own agency and intention to the material objects which represent the prototype often by virtue of resemblance. Meanwhile, prototypes restrain an artist's action and inherently dictates the form of an artwork. Gell's theoretical framework, therefore, dissects the efficacy of art on the micro level and carves a new space for anthropological enquiry towards art beyond the disciplinary scope of art history. This approach has carved a new culturally neutral space for anthropological inquiry towards art to avoid the Western-centric traditions in the study of aesthetics and iconography. The 'art nexus'

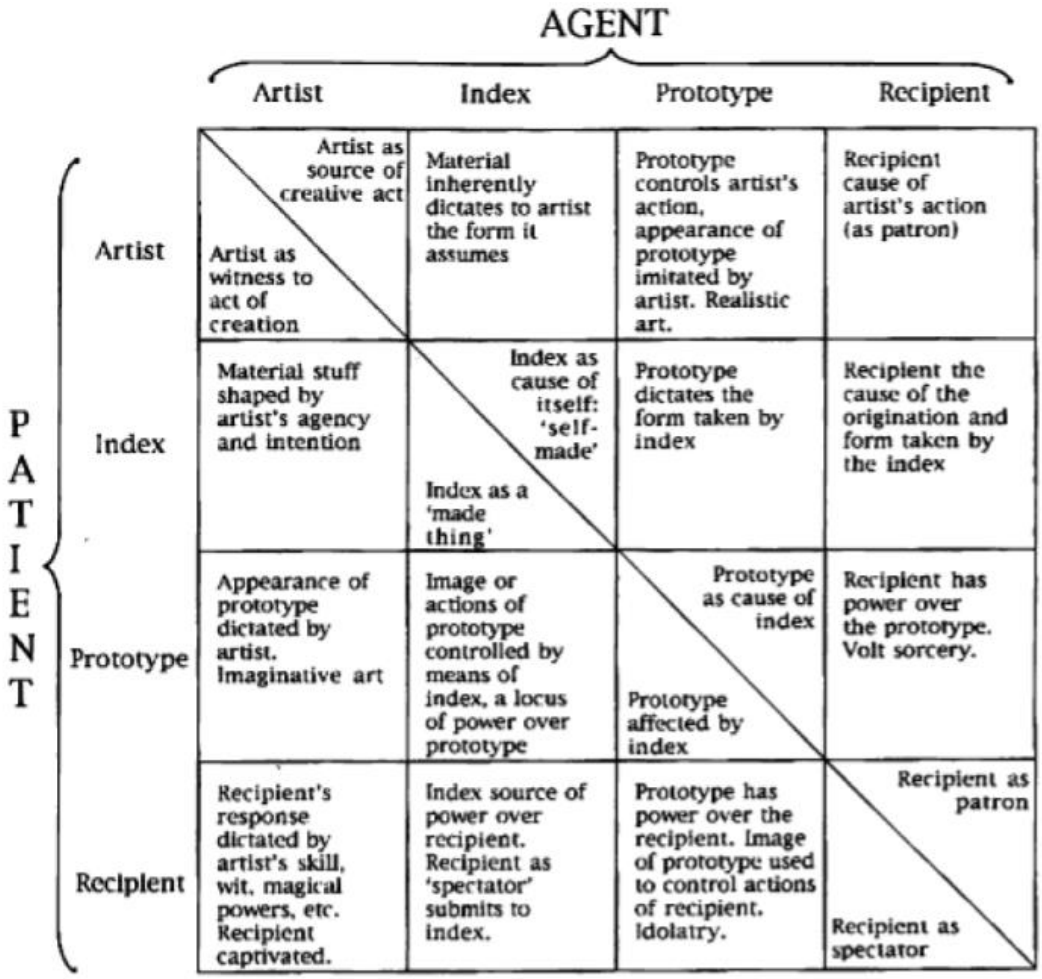

Figure 6: The 'art nexus' by Alfred Gell (1998: 29)

construction also allows movement with facility between 'subjects, objects, practices, materials, institutions and cognitions, actions and feelings', as Mackenzie applauds (2006: 19).

As Gell did not have time to revise this manuscript in his lifetime, some obvious flaws in his art theory have been severely criticised. Layton stands with Gell's refusal to apply linguistic models in interpreting art as visual communication but opposes his separation of art and its cultural background to 'minimize the importance of cultural convention' in art reception, which in Layton's view is essential to avoiding misinterpretation in cross-cultural research (2003: 447). Layton also points out that Gell has downplayed the significance of the senses if the capacity of art is to influence the audience cognitively (ibid.: 459). Morphy also suggests that Gell's concept of art as an agentive object 'has gone too far' because he fails to answer the most important 'how question', namely how art objects operate as a mode of action (2009: 7). Indeed, it seems implausible to

completely remove the aesthetic and semantic aspects of art, as Morphy notes, and if only the functional dimension of art is considered, the boundary of the discipline, 'the anthropology of art', together with the distinction between art creation and other craft making seems blurred and ambiguous. As Gell's aesthetics-free study of art in Marquesan ritual or magic manifests little indication of 'artness,' it can be seen as merely ritual or magic research (Morphy 2009). Bowden expresses similar concerns that there is no coherent definition of art in Gell's theory although he has indicated that art objects show 'technical expertise', 'imagination of a high order' and knowledge about 'the intrinsic mechanisms of visual cognition with subtle psychological insight' (Gell 1998:68 quoted in 2004: 323). These artistic properties proposed by Gell, nonetheless, are not exclusively in artworks but also manifest themselves in entities such as advertisements and computer games. Furthermore, when Gell foregrounds the complexity of artistic techniques, he pays little attention to the 'conceptual originality' of art in revealing the world's complicatedness (ibid.: 322), which is an aspect of art aspect prominent in contemporary works.

Despite these drawbacks, Gell's theoretical formula draws analytical attention towards the materiality of art, the artist's techniques and the interactive relations among the artist, the prototype, the art object and the audience. This 'art nexus' framework fits well into Liang Shaoji's silkworm projects, where the silkworm can count as the prototype of the 'index' silk, whose form is dictated by both Liang and the silkworms' agency, as later chapters will elaborate. The advantage of Gell's theory applied in Liang's silkworm art lies in its facility to involve silk and the silkworm into interpersonal sociality in art-related situations without having to render animistic agency to them by causal inference (cf. Latour 1999). As Gell's theoretical formation is based on abundant ethnographic details of Marquesan ritual art, the necessity to explore artists' skills and the art-making processes in ritual scenes of small-scale societies seems self-evident in regard to ritual art's function. As for Liang Shaoji's silkworm art series, this thesis does not intend to completely abandon the search for aesthetic, sensory and symbolic aspects in Liang's project contextualised in Chinese sericulture and silk culture. However, drawing on Gell's agency and art nexus framework can amplify the social relations in the vicinity of

physical art objects in Liang's works and hence on this more micro scale, analyses his whole oeuvre as a set of ritual art with specific focuses on artistic technique and efficacy.

The complexity of artistic skills, as Gell stresses (1992; 1998), guarantees the art's enchanting effect to motivate the viewers in rituals. In Liang's case, the whole art-producing process involves the material entanglement of the physical bodies of the artist and silkworms and non-organic objects namely silk and other entities. As Miller argues on the mission of material culture study, 'the stance to materiality [...] remains the driving force behind humanity's attempts to transform the world' according to their senses and beliefs about the world, and hence the important question to tackle is how the things humans make can make people in how they think and behave (2005: 2). Ingold (2000; 2013) follows Miller to oppose the problematic dichotomy between conceptual design and material substance, as there is no clear-cut boundary between artefacts and natural things. In Ingold's model of artistic technique, people dwell in the living environment and engage with the materials to design and make art, and this creative activity is ongoing with both the perceptive flow of the art maker and the material flow surrounding (ibid.). Linking back to Gell's model of reciprocal agency, the biological capability of the silkworms as the agentive prototype and the material traits of the silk will, in turn, influence the artist's perception of life, materiality and the environment and moreover dictate the capacity of Liang's artistic technique.

Ritual, liminality and efficacy

Provisionally interpreting Liang Shaoji's silkworm projects as ritual art would lead to another large reservoir of scholarship on ritual study. Rituals, similar to art, can be of transformative consequence and practical efficacy beyond their presentational and representational functions (cf. Morphy 2013: 655). Most anthropological studies on ritual, especially on its efficacy, address more macro functions upon the whole community (e.g. Geertz 1973; Leach 1973; Rappaport 1968), ranging from modelling social values for cohesion in initiation rites (Durkheim 1912) to safely releasing social tension in a 'rite of rebellion' (Gluckman 1965). Here it may be useful to overview studies on efficacy and liminality in rituals in broader anthropological contexts to illuminate possible approaches to bridge expressive and functional aspects of ritual art.

On how ritual performances enact social influences, Rappaport (1968) provides an animal behavioural perspective to highlight the survival value of rituals for a local ecosystem in his functionalist interpretation of *kaiko* ritual in the Tsembaga Maring community in New Guinea. The violence-filled *kaiko* festival begins when the number of pigs in the village is so large that they destroyed crops, therefore acting as a regulated response to a critical point of the ecosystem's sustainability. At the end of the ritual phase the human-pig-crop system returned to stablity and viablity. As Rappaport (ibid.) demonstrates, there was a statistical correlation between ecological stress and ritual events whereby the pig-environment-society ecosphere periodically reached a threshold. Thus, Rappaport's model centres ritual actions over beliefs and ideas and regards rituals as the origins of humanity, while in Durkheimian traditions, rituals are seen as the expression of social orders and beliefs. However, the flaw in Rappaport's approach is its inability to deal with rituals in complex and ever-changing large-scale communities rather than static and enclosed ecosystems simplified for analytical purposes (Eriksen 2015: 42). A more hermeneutic approach towards ritual's efficacy, as Geertz (1973) shows in his 'thick description' of Balinese cockfight, abandons seeking statistical models and social patterns but turns to interpreting meanings in the Weberian 'web of significance' by using human sympathy. Ritual in this sense is composed of symbols while creating new structures of meanings to exert its influence. Bell (1992), on the other hand, draws on Bourdieu's theory on social habitus (1977) and argues that ritual works because people agree by social conventions that it works. She questions the agency of ritual participants in such processes of 'socially instinctive automatism' as values, beliefs and social codes are inscribed into ritualised human bodies as passive receptor (ibid.: 99). Comparatively, Gell's (1998) formula, as primarily adopted in this thesis, acknowledges the agency of both the initiator (artist) and the recipient (audience) in ritual art, and can be used to scrutinize ritual art's efficacy on a more interpersonal scale, in most cases cognitively. In Gell's framework, ritual art functions by reorienting people's mental status and thinking processes. Instead of reading art objects in ritual as conveyors of symbols, Gell spotlights the materiality of both humans and nonhumans,whose physical traits and capacities can enact influence upon each other via the mediation of artistic techniques.

This thesis puts Liang Shaoji's artworks under the analytical framework of ritual art, not only because the cross-species social relations for silk around his art projects fit well into Gell's 'art nexus' theory, where the artistic techniques of raising silkworms and making silk-bound installations should be placed in the foreground. It is also because Liang's silkworm art not only critically reflects structured social tensions and contemporary quotidian life (e.g. Gladston 2011; von Drathen 2011; Xia 2015; Zulueta 2016), but also 'play[s] creatively upon them' as rituals do to dissolve conventions (cf. Ingold 2013: 342). This creative and processual force in rituals to potentially enact social change has been prominent in literature on 'liminality', a key term to capture the critical and creative potentials of rituals (van Gennep 1909; Turner 1969, 1974).

The concept 'liminality' literally means threshold or doorway from the Latin '*limen*', denoting the in-betweens of two spaces where changes and transformations take place. It has been largely applied in anthropological ritual studies to deal with ambivalent and malleable situations. In van Gennep's (1909) study on 'rite of passage', he consciously avoids Frazer's (1890) approach to examine the significance of ritual and its relationship to myth, but rather focuses on ritual's efficacy to change one's social status. He divides 'rite of passage' into three phases of separation, transition and incorporation, where the transition stage is the liminal zone of ambiguous transforming socio-cultural identity and ontology. Turner (1969) follows van Gennep to emphasize the creative power of the liminal stage in rituals, as liminality can subvert or negate established social categories and conventions and structures. In Turner's (ibid.) symbolic analysis of Ndembu initiation and healing rites, the efficacy of these rituals lie in their liminal and reflexive potentialities by creating and deploying visible assemblages of symbols. Rituals hence can convey insight, resistance and possible social transformation by connecting the bodily experience of ritual practitioners and more abstract thought. Subsequently, Turner (1974) extends the applicability of 'liminality' from ritual scenes to socio-cultural life where the liminal stage can be an anti-structural continuous state refusing social hierarchy and structural division. Art in this sense can be 'liminal' in contemporary society if it keeps threatening categories, questioning traditions and stirring reflection and creation.

It is worth noticing that the autonomy, creativity and anti-structure potential of liminality in Turner's theorization has been criticized as over-romanticizing change, as it portrays everyday life as over-routinized, static and inhumane in order to highlight the value of liminal status (Rapport and Overing 2000: 235). However, it remains a productive analytical tool to detect liminal perception, identity and practice in either ritual or art interpretation. Ritual can be understood as 'performed behavioural artefact', according to Schechner, and thus the body experience of acting in ritual is itself anti-structural, destabilizing and liminal (2013: 641). Applying analytical toolkit of ritual to art practice is possible and productive when Liang Shaoji's artworks can be examined as a performative ritual events as this thesis will further demonstrate.

Methodology

This thesis adopts qualitative anthropological methods to understand details of the art-making processes, the artist's artistic techniques and his quotidian interactions with the silk and silkworms. Multi-sited fieldwork in reference to multispecies ethnography has been conducted as the main research method to facilitate further discussions on the expressive, presentative and functional effects of *'ziran'* in Liang Shaoji's silkworm art. My multi-sited fieldwork in mainland China lasted from early March to the end of November in the year 2019. The locales include Hehci and Nanning in Guangxi Province, Shaoxin and Taizhou in Zhejiang Province, Shanghai and Beijing. As this section shall outline, my investigation into how Liang Shaoji raised silkworms and made art with them mainly relies on participant observation as the cornerstone method in conventional fieldwork with complementary interviews (Bernard 1994). My interviewees involve not only the artist but silkworm biologists, silkworm egg breeders in factories, farmers and officers in sericultural departments etc., for the purposes to gain extensive knowledge about silkworm husbandry in China as the larger practical context of Liang's art projects. Because silkworm is regarded as a significant agent in Gell's 'art nexus' model as delineated in the previous section, this project also employs 'multispecies ethnography' (hereafter as 'ME') as both a new model of research and a

new genre of anthropological writing (e.g. Kirksey and Helmerich 2010) to spotlight this insect from a less anthropocentric perspective. I lived and laboured with silkworm farmers as an apprentice to acquire practical sensory knowledge about silkworm husbandry and human-silkworm cohabitation. Multispecies ethnography allows me to take notice of common activities and body forms within human-silkworm assemblages in certain landscapes (e.g. Tsing 2013: 32), which I will further explain below.

My pilot field trip to Beijing dates back to mid-September in 2018. It was at the end of my first year when my initial doctoral research plan was to study ecological art practice in contemporary China. I attended the opening of Liang's solo exhibition '*Huang* (As If)' at MWoods Museum in Beijing on 14th September when the artist himself provided a guided tour and explained the connotations of the character '*Huang*' for the exhibition title as 'suddenly', 'seemingly' and 'ecstasy'. I then conducted a two-hour interview with Liang on the 17th at the office building of MWoods, after which I realised that I need to brush up on my knowledge of silkworm biology to better understand Liang's artistic experiments. The technical skills required to realise his silkworm projects were still too vague and lacked tangible details by merely talking with the artist and reading art critics' articles. I was determined to narrow my doctoral research to Liang's works only and turned to a more anthropological approach. Meanwhile, in the following course of my learning mulberry-silkworm biological knowledge from textual materials, I happened to notice a thriving silkworm husbandry industry in my hometown Hechi City which I had ignored in my adolescence and later needed to refamiliarize and revisit for this project.

At the end of March in 2019, I met Liang Shaoji again in Wuzhen County of Zhejiang Province, where the second Wuzhen Contemporary Art Exhibition 'Now is the time' was held and three of Liang's artworks were among the group exhibition there. I attended several talks by artists and curators including Liang. I also visited an old silk reeling factory site situated at the heart of a designated tourist area where workers were showing visitors how to boil cocoons and reel silk on a treadle machine. I interviewed these workers briefly in order to learn about the current situation in this former 'silkworm province'. Although silkworm husbandry in Zhejiang is not within my research scope, this fragmented information helped me to better understand the general

picture of sericultural development in China. Another group exhibition 'Growing' I visited was held at Chronus Art Centre in Shanghai where Liang's works were juxtaposed with other world-renowned bio-artists such as Eduardo Kac and the Tissue Culture & Art Project. On-site experiencing artworks is surely a good channel to engage with and comprehend them, but I am more interested in the backstage stories between the artist and the silkworms, so as to make a more accurate interpretation supported by details of his art-making processes.

Besides three gallery visits, I also went to Liang Shaoji's art studio and home located in Tiantai County, Zhejiang Province in early April 2019. Liang rents a single office room as his home within Tiantai Museum, a complex designed by architect Wang Shu. He didn't cook himself but dined in the staff canteen with the museum's security guards; he used the building's communal facilities such as bathrooms and toilets to keep a minimalist life. His room was converted from an office, furnished only with a bed and desk, and abundant books, magazines, journals and drawing drafts piled from floor to ceiling. Liang rented another large office in the museum complex and a car park on the opposite of the street as his two studios (fig. 7). During my stay in Tiantai, I saw a large number of unfinished or unexhibited works and sericultural tools in the artist's studio; I met his local friends and other museum staff to have dinners and chats. Liang told me that at one point he was conducting the whole processes of raising silkworms and creating his artworks in his studio in Tiantai, but for one thing, the bad smell of diseased silkworms was too strong for museum visitors, and the cost of transporting fresh mulberry leaves from mulberry fields to the downtown area daily was prohibitive. He thus rented a plot of land in a rural village in the neighbouring county Linhai to plant mulberry and feed silkworms. Until the larva reached their fifth instar before the cocooning phase, they were moved by car to Liang's studio in Tiantai to join the artwork creation.

Besides, Liang's studio in Tiantai sits at the foot of Tiantai Mountain by the entrance to a national scenic site. The ancestral temple of the Buddhist Tiantai sect, Guoqing Temple, is located on this hill. Liang conducted a performative art project named 'Cloud Mirror' in 2007 where he sat at the peak of Tiantai Mountain with a mirror on his knee

Figure 7: Liang's studios in Tiantai, Zhejiang (Photo: XU Feixuan, 2019)

and live silkworms were spinning silk filaments on the flat mirror with the clouds' reflection. Climbing Mount Tiantai and visiting Guoqing Temple gave me a more tangible understanding of both the 'Cloud Mirror' performance left only on video, and the local Buddhist-Daoist culture of Tiantai, which Liang claimed deeply influenced his artworks. I had extensive conversations with Liang in Tiantai, although the April climate and temperatures in Zhejiang were still too chill for sericultural practice and therefore local silkworm season is a month later than that in subtropical Guangxi. I hence did not witness how Liang Shaoji took care of silkworms in Linhai or Tiantai, but the visit to his

studio is still fruitful where I got to know the artist's living and working environment, his acquaintances and the oral history of his whole life journey.

As a supplement for not being able to actually participate and observe how the artist raises silkworms and creates artworks on-site in Zhejiang Province, I returned to Hechi of Guangxi where I can more conveniently live with silkworm farmers for a longer period of time to gain first-hand practical knowledge about this insect and how to take care of them. Yizhou County in Hechi City became the largest cocoon and raw silk production centre nationwide and globally in the recent decade, due to the industry transformation policy 'East Mulberries Moving West' officially implemented by the Chinese government in 2006. Thereby, less economically developed southwestern provinces with lower labour cost namely Guangxi, Yunnan and Sichuan gained the state support out of this initiative and gradually replaced the historical 'silkworm regions' such as Guangdong at Pearl River Delta and Zhejiang and Jiangsu at Yangzi River Delta where silkworm husbandry is shrinking, and more governmental investment instead is devoted to the silk processing industry. I grew up in the downtown area of Hechi until I left home in 2010 to attend university in Beijing. However, it was not until I started working on this doctoral research that I had any knowledge of Yizhou County seventy kilometres away as an emerging silkworm husbandry centre in China and the global world.

My identity as a local has largely facilitated my fieldwork. On the one hand, I was able to find desired gatekeepers more quickly through my family's social network of acquaintance in Hechi (known as 'relations (*guanxi*)' in Chinese social codes) and gain access to levels of government departments, silk reeling and processing enterprises, research institutes and sericulturists in the whole industry. In early April when the silkworm season of 2019 began, I rented a bedroom in a farmer's farmhouse in Village X (pseudonym for anonymous purposes) in the northern suburb of Yizhou County to begin my long-term research in this rural area. As I speak the local dialect, my daily communication with people of all occupations and ages encountered no barriers. I was involved in the daily labour of raising silkworms for the family where I resided, to obtain my own embodied and sensory knowledge of nurturing silkworms. I also spent time

wandering around the lanes and mulberry fields, chatting with local residents and joining in occasional gatherings within the village. Most of the villagers raise silkworms at home; some are too old or physically challenged to do the heavy work of picking leaves, but they would assist the feeding or at least know something about silkworms. I have a distant relative who lives in another village on the western outskirts of Yizhou, half an hour's drive from Village X. I also visited that village three times for some possible similar or different voices. My months' experience of cohabiting with silkworms and farmers in Village X guarantees me rich insights into the silkworm as a companion species, raising silkworm as a livelihood and sericulture as an industry, which allowed me to attend to sharp details and ask pertinent questions when interacting with silkworm scientists and the artist Liang.

Besides living, visiting and learning with silkworm farmers in villages on the outskirts of Yizhou, I also made several day trips to the town centre of Yizhou and visited the government's sericultural office, the workshops of silk reeling and pupa processing factories and a state-run silkworm breeding station. I obtained the last three years' industry reports of sericulture in Yizhou from the sericultural office, from which I gained a panoramic view of silkworm husbandry in this region. In my frequent visits to the silkworm breeding station, I interviewed the chief scientist as a manager and several female breeders there, learned how to cut the cocoons to get live pupae for mating and reproduction from these women and observed the entire process of silkworm egg production. This gave me an intuitive glimpse into an alternative fate of cocoons sold by farmers other than being boiled on the reeling machines, which can be further compared with the fates of silkworms raised and employed for the artistic mission by Liang Shaoji.

Moreover, as Liang's artistic techniques to work with silkworms draw heavily on the outcomes of scientific studies of sericulture and hands-on support from biologists on crossbreeding, I approached silkworm scientists to deepen my comprehension of a more pragmatic experiment-based method to study animals. I went to the capital city of Guangxi Province, Nanning, for short stays in March, April and November, where the provincial research institute Guangxi Sericulture Research Centre is located. I chose this

institute for my focused research on silkworm biology because it is a branch of Guangxi Academy of Agricultural Sciences. My late grandmother used to work at the academy as a crop scientist and her former colleagues kindly acted as my gatekeepers, so that I was allowed to carry out short-term archival and anthropological research at the labs and the library in the sericulture institute. I mainly conducted participant observation when staying in the biologists' labs, noting them making samples, recording results, taking photos and discussing the experiment processes. I was merely not allowed to enter the lab working on breeding for resistance to pebrine disease, as I was not familiar with the code of conduct in such a lab environment and possible leakage of this pathogen would lead to negative consequences. In addition to casual talks with present scientists, I conducted two in-depth semi-structured interviews with a chief biologist Mr Zhang at this institute, who kindly answered my additional questions on the instant messaging app in the later stage of my research after the fieldwork. Equipped with more knowledge on the scientific epistemology toward silkworms, I was able to critically examine the artist's ongoing cross-disciplinary collaborations with silkworm biologists over the last thirty years.

In my multi-sited fieldwork, I carried a notebook and pen most of the time to take notes and draw rough sketches. Only planned interviews with the interviewees' oral permission were digitally recorded by my voice recorder. The interviews were conducted in Hechi dialect or Mandarin, and I made factual transcriptions by myself and translated sections used in this dissertation into English. My field diary contained a record of my everyday witness, immediate emotional reactions and thoughts written at night from memory. In addition, I also refer to archives from Guangxi Sericulture Research Centre, government work reports and industry annual reports from the sericulture office of Yizhou County, media reports, art critiques, historical records, academic papers on sericultural science and online chats with my interlocutors. I tagged these textual materials with keywords, which allowed me to better identify commonalities in silkworm raising experiences and techniques across arts, science and agriculture. Besides, I carried a portable camera for photography and video recording; these visual and audio materials serve both for my analysis and possible multi-media sharing of my research outcome other than dissertation later. Due to the limited

mobility in Covid-19 pandemic since 2020, I was unable to return to mainland China to conduct a follow-up fieldwork research and therefore my comprehension of the impact of Covid-19 on the industry as a whole and individuals involved is limited and incomplete; for this reason, in this dissertation, the situations in and after 2020 will not be discussed.

To further reflect upon my research strategies on the relationship between silkworms and Liang Shaoji in art-making processes, it is necessary to begin by reviewing the early anthropological approaches towards animals. Anthropology has its long tradition of exploring other living organisms 'as part of the landscape, as food for humans, [and] as symbols' (Kirksey and Helmerich 2010: 545) in its archaic discourses of totemism, savage animism and primitivism. Animals and plants in nature, being the familiar targets of anthropological inquiries, have served as mirrors and windows for analysis of human societies and cultures (Mullin 1999), where abundant ethnographic accounts attempt to delineate local cosmologies, ecological knowledge and dwelling strategies in many non-Western, pre-industrial communities. Domesticated species, in particular, are never absent from the disciplinary lineage of anthropology, especially in studies of agrarian and pastoral societies. Animals are prominent in the early anthropological literature on evolutionary patterns of societies (Morgan 1868), social organizations (Mauss 1967) and structuralist totemism (Lévi-Strauss 1966).

Although these theoretical frameworks on human society and culture are accused of instrumentally presenting and using animals and thus seem human-centric, Galvin defends these studies' attention and recognition of mutual dependencies, nonhuman agencies and entanglements of human and non-human lives' (2018: 235). Ingold also regards the current 'animal turn' in social sciences and humanities as nothing significantly new for anthropology and plants and animals are neither inert nor passive but usually 'ontologically equivalent' in manifold places, periods and communities in anthropological inquiries (1980; 2013). For those familiar with ecological studies of hunter-gatherer societies, pastoralism or farming, as Ingold claims, 'the oft-repeated claim of material culture theorists—namely, that the "non-human" has been marginalised or suppressed in the social sciences—seems preposterous' (2013: 16).

Multispecies ethnography, however, emerged within this discipline in the recent decade to discover and learn more egalitarian possibilities in contingent multispecies relationships in more contemporary situations. It encourages exploration into the natural-cultural borderlands and concentration on the entanglements of agentive matters and organisms in a multiplying assemblage (Kirksey and Helmerich 2010). This approach can be associated with the Deleuzian concept of 'becoming', both of which abound in 'non-hierarchical alliances, symbiotic attachments and the mingling of creative agents' (ibid.: 458). Tsing's multispecies ethnography, as an exemplary case study, delves into the commercial mushroom collected from the seams of the global capitalist market, where the mushroom is portrayed as a symbiotic companion species often flourishing at the marginal zones such as the ruins at Chernobyl despite the severe ecological destruction (2012: 152). The research method Tsing proposes is to visit the field enough to get familiar with the species' assemblages and body forms in a certain landscape as their expression of sociality (2013: 32). She also contends that 'critical description' should be employed in ME studies on more-than-human sociality, which requires a sensibility to appreciate and learn with other organisms through common activities (ibid.). Research focuses on micropolitics and microbiology featured in Tsing's mushroom-centred ethnography are too prominent in Paxson's study on microbial entanglements in pasteurization and raw-milk cheese production. Focusing on the food value and ethics attached to the Pasteurian standards in the cheese industry, Paxson (2008) examines issues of food safety, state regulation, and customer culture around cheese consumption.

Ethics is another crucial aspect for consideration in ME literature. What is conventionally regarded polite and nice in interpersonal communication would not be necessarily valid and plausible in trans-species interaction and therefore cannot be simply imposed as measuring standards into new situations. Candea (2010), for instance, takes a close observation of biologist-meerkat relations at a research station in South Africa and advocates the productive values of cultivated detachment instead of commonly praised connection and engagement in human-animal relations. As Candea notes, detachment, though often passively associated with moral inferiority,

uncaringness, cold-heartedness and indifference, can enable mutual suspension of action and the maintenance of a polite distance. He, therefore, proposes an ethical stance of inter-patience where 'action and inaction, engagement and detachment are inextricably entwined', allowing 'the extension of the meaning of relationship beyond intersubjectivity and interaction' (ibid: 249). Blanchette also provides an astonishing ethnographic account of sows 'that cannot be pet' in farm factories (2019). There is an unspoken term in industrial animal husbandry that unexpected petting and caressing could surprise the pregnant sows and cause them to startle, writhe or even abort in the cage, as Blanchette introduces, and one sow's miscarriage out of shock could even pass down like a wave to a row of its peers nearby (ibid.). Those pigs are weakened by uniformly working routines and therefore cannot afford 'excess affect' from human workers or visitors in the workshop (ibid.: 69).

From a more ontological perspective, Kohn (2013) in his study of dogs and their Runa masters' in Amazonian forests probes into indigenous cosmology and cross-species communication in their metaphoric dream interpretation. People there believe that through dreaming, consuming hallucinogens and tobacco they can gain access to the perspectives of other beings such as the dogs, but entering canine subjectivity risks the loss of human beings' privileged ontological status (ibid.: 143). Applying the conceptual tools in Peircean semiotics, Kohn radically argues that life is a signing process exceeding the symbolic representation and human speech and the trans-species pidgin in the forest is embodied and emergent, iconic and indexical (2007: 18). Acknowledging nonhuman ontologies and capacities to make worlds, the Amazonia style of perceiving nature and engaging with the biosphere delineated by Kohn is an exemplary presentation of 'perspectivism' in multispecies ethnography (also in de Castro 2004).

Kohn's insightful perspectivist approach to nonhumans is praised by Ingold as nonhumans in such cosmological framework can communicate without a human spokesperson on their behalf 'simply by virtue of their presence and activity' (2013: 20). Descola instead criticizes the limits of Kohn's works as unable to be applied in other types of ecosystems, because each lake, forest and hill has its distinct networks, life forms, landscape features and therefore has a unique way of 'thinking and speaking'

(2014: 270). Descola then points to the direction of further research along with the genealogy of ME to explore 'how reciprocal interpretations of behavioural and environmental signs have built up the respective knowledge of coevolving humans and animals' (2014: 272).

More severe criticism of ontological turn in multispecies ethnography comes from Graeber with his perceptive awareness of power relations and politics. He condemns the excessive dedication to understanding and describing forms of 'radical alterity' as too essentialist, de-historicizing and conservative regarding its potential result of 'protect[ing] more structurally powerful and authoritative ontological positions from [any] challenge' (2015: 7). Another disapproving voice against ME as a research method targets its grounding concept 'species'. Haraway explicitly rebukes the term as unsteady and oxymoronic to indicate biological distinction and familiarities (2008). Ingold similarly denounces it as a sovereign perspective that places humanity as a central and universal referential point to recognize biodiversity or species multiplicity (2013: 19). When the logic of multispecies is to associate individuals by their received likeness and to divide them by diversification, Ingold on the contrary contends that difference connects and similarity divides (ibid.: 20). In his proposed project 'anthropology beyond humanity', anthropologists distinguish themselves from other disciplines not by the research objects but by the unique way of working and learning through participation in other lives. He revives the idea of 'craft' from Mills (1956 in Ingold 2013) and argues that there is no division between method and theory as well as work and life (ibid.: 82). Anthropology hence is the craftsmanship of 'studying with' rather than 'studying of' (2008; 2013). Despite all the disputes on the terminology for analysing interspecies symbiosis, the above literature in both theoretical and methodological level paves new directions for further exploration in human-animal interaction and communication, from which I draw inspiration for my own research on the artist-silkworm sociality.

A posthuman take on domestic animals such as the silkworm is to include them into the sociality with humans, which used to be conspecific within interpersonal connections and now is expanded to the interspecies interactions (Haraway 2008; Latour 2004). Compared to wild animals, those domesticated ones are thought to have

more 'experience' in socializing with human beings and therefore it is more likely to detect their attitudes towards us as close acquaintances (Coy 1989). Ingold distinguishes taming from herding as two modes of domestication when in the former animals are intimately incorporated into human households as part-members and the latter approach involves more depersonalization of organisms into mere resource management or labour exploitation in capitalist schema (1980). Following ME's proposal to (re-)imagine the 'webs of interspecies dependencies' (e.g. Tsing 2015), this thesis compared Liang's artistic co-working with domestic silkworms with other forms of human-silkworm entanglements in agriculture and science in China, to more accurately capture the uniqueness of his artistic techniques and conceptual adaptability of '*ziran*' along with the trans-species 'collaboration'.

As a domesticated species, silkworms cohabitate with farmers within their houses in rural villages in China, for most of whom raising silkworms and selling cocoons is the main part of their family livelihoods. The artist, too, nurtured silkworms in the countryside of Linhai county, which indicates physical and probably affective intimacy. As a tactic way to study silkworms, I employed their human caretakers as interlocutors and 'study with' them (cf. Ingold 2013) to avoid the accusation of multispecies ethnography as extending anthropological 'otherness' to nonhumans (DiNovelli-Lang 2013). Meanwhile, I learned the craftsmanship of raising silkworms in an apprenticeship, being an amateur in sericulture to gain bodily experience and knowledge on those insects as a field method (Coy 1989). Learning in pragmatic contexts allows me to access the verbal discourse and non-verbal kinaesthetic comportment in the sharing of sericultural techniques and caring knowledge (Cohen 2010). Regular schedules of 'toil' with the conscious reflection of everyday mistakes and progress (Cohen 2010; Marchand 2010) had brought me ethnographic insights on issues such as the possible ethical scenario between politeness and manipulation, harmonious or exploitative strategies for multi-species collaboration and cosmological connotations of ecology in Liang and silkworms' co-making of art.

Overview of Chapters

Drawing on the delineated fieldwork, this research examines how the Daoist-flavoured concept '*ziran*' is practiced and reflected in Liang Shaoji's silkworm artworks by probing into his artistic techniques and the agency of silk and silkworm in the durational ritual art processes. Chapter One situates Liang's thirty years' art experiments with the silkworm in the pragmatic context of contemporary silkworm husbandry as backup for the silk industry in China. In raising and feeding silkworm larvae, Liang gained great physical support from local farmers in Linhai village and technical assistance from biologists in crossbreeding operations in the lab. By juxtaposing the different practical skills and knowledge acquired by silkworm farmers and the artist in handling this species, the key characteristics of Liang's artistic technique has been summarised as 'making-in-cultivating' because his processual practices of cultivating silkworms and making art were inextricably intertwined as exemplified in his artistic inquiries into the music preference of silkworms and the sounds they made shown in the project 'Listening to the Silkworm'.

Chapter Two narrows the scope down to the flat cocoon technique which dominates most of Liang Shaoji's art installations and performances. It portrays Liang's experiments with various materials used as the flat planes for silkworms to secrete flat silk and the correlation between hormonal treatment and the texture of flat silk flakes. The physical health and possible psychological conditions of silkworms secreting flat cocoons were also speculated based on anthropomorphic empathy. These practical details pave the way for further discussions of the ethical evaluation of Liang's approach to silkworm collaborators in terms of Daoist principles of spontaneity and non-action. Chapter Three introduces the conventional symbolic connotations of the silk and silkworms in Chinese material culture as the background and then draws on archaeological findings on silk's mediating role in ancient funeral rites to speculate on the expressive and functional importance of flat silk in Liang's artworks. Case studies include installations namely 'Helmets', 'Snow Cover' and 'Time and Performance' and performances namely 'Cloud Mirror' and 'Self-roped'. Under Gell's analytical framework of art nexus, the agency of the silk and silkworms respectively in the art-generating

processes and the ritual pattern of 'wrapped in silk' have been closely examined. Flat silk in these rituals acted as the mediator to heal the wounds and communicate with the supernatural, while silkworms also participated actively in the meaning construction and effect enactment by crawling over materials and spinning silk to cover them up.

Chapter Four shifts the focus towards two projects dealing with the cross-species analogy between silkworm larvae and human infants implicitly in 'Beds' and explicitly in '*Bao-bao*'. The affectionate address 'silkworm babies' has been contextualised in the ways Chinese people talked about and took care of this insect in daily lives, manifesting an underlying anthropomorphic mindset across species boundaries. This culture-bound mentality fosters the cognitive efficacy of the adoption ritual of '*Bao-bao*' to allure the audience to build a kinship-like bond with silkworm pupa in man-made and self-made double swaddling clothes. Chapter Five is a case study of 'Broken Landscape' which embodies the most complex liminal states around the motif '*ziran*' and the blurred roles of silk-silkworm assemblage as both the prototype and the art object. Besides, the silk fabric in this artistic ritual on life has been critically compared with Duchamp's 'Fountain' and cotton clothes in a silkworm breeding station, respectively illuminating the appropriation of sensory experience in art spaces and how the frame of art can direct viewers' attention and interpretation.

The dissertation concludes with the examination of the social relations among the artist, the silk and silkworms in Liang's silkworm oeuvre through the lens of ritual art and further reflects upon the necessity of ethnographic methods in exploring bio-art dealing with ecological thought while involving live animal's participation. By unpacking the liminalities and paradoxes in Liang's artworks namely between cultivating and making, manipulation and intervention, organism and object, materiality and spirituality, artificiality and naturalness, this research examines how Liang's art series explore the richness and ambiguity of '*ziran*' in critical and creative ways rather than a fundamentalist representation of Daoist principles.

Chapter 1: The Art of Making and Cultivating

The timeline of silkworm (*Bombyx mori*) domestication stretches over more than three thousand years. The silkworm's relationship to human society has ranged from silk manufacture and consumption, to artistic expression, agricultural production and, in modern times, bioscientific experiments. Silk has been used as clothing, but also as a medium of exchange, a writing and painting surface as well as diplomatic offerings in ancient China from around 3000 BC, thus forming a quintessential part of Chinese material culture. In contemporary society, both silk and the silkworm have been commoditized as organic bio-product in local and global markets, boosted by fast-developing biotechnologies such as trans-genesis, transplantation and gene editing etc. Exquisite silk garments and silk fabrics as painting surfaces have been the most common material channels in which silkworms are indirectly associated with the realm of art. In contemporary art worlds, the way silkworms engage in art creation takes diverse forms, such as in Liang Shaoji's '*ziran*' series where those low-profile off-stage creatures have been cultivated by the artist Liang and confronted more challenging artistic tasks. This chapter will first provide an overview of the labour-intensive silkworm husbandry in China to contextualise Liang's first ten years in the 1990s when he lived and worked with silkworm farmers to familiarise himself with his animal collaborators. Liang acquired not only practical knowledge and skills in raising silkworms but also artistic inspirations from everyday toil in the farm, as exemplified in his sound installation '*Listening to the Silkworm*' (2006). Following the case study is a brief reflection upon the boundary between techniques of making (art) and cultivating (organism) in the silk-generating processes which questions the 'natural-ness' (*ziran*) in the essence of silk (as material) and silkworms (as life).

Silkworm Cultivation in China

The English term 'sericulture' is a teleological compound. In 'silk + cultivation,' the end product silk has been placed at the centre of the whole industry. Raw silk is not actually cultivated but comes from filature where cocoons are reeled into threads usually in boiling water. What farmers cultivate in sericultural farming are silkworms and

mulberry trees, two species that are prominent in the Chinese counterpart of the term sericulture, '*sang-can*' (桑蚕), literally 'mulberry and silkworm'. These have accompanied each other throughout the history of Chinese sericultural practice and expertise. In the Chinese language, the most and almost the only verb used to describe the activities of silkworm cultivation is '*yǎng*' (养). 'Yang' has a versatile usage. It can be put before living organisms such as a baby, patient, plant, livestock, germs etc. or combined with more abstract concepts namely a habit, family, health, spirituality and morality. The fluid connotations of '*yang*' as an action vary with its specific contexts, but the term's English equivalences can be to 'grow', 'cultivate', 'feed', 'breed', 'raise', 'nurture', 'keep', 'educate', 'maintain', 'nurse', 'convalesce', 'nourish' or support etc. (Oxford Chinese-English Dictionary). In silkworm husbandry for large-scale silk industry in China, fresh mulberry leaves remain the sole nutrition and energy source for this species whose survival and reproduction are highly dependent on its human raisers (Zhao 2005).

The labour-intensiveness of silkworm farming lies in the astonishing growth of silkworm caterpillars, whose body size can multiply by a factor of 10,000 within its three weeks' larval phase after hatching from ant-size eggs (Field 2014). The lifespan of a domestic silkworm normally lasts around fifty days in total (fig. 8), and farmers are only involved in half of their lifetime from newly hatched larvae in the first instar (i.e. a phase between two periods of moulting) to pupae in freshly spun cocoons. In twenty to thirty days, silkworms go through dramatic morphological changes and their human keepers have to meet their physiological needs in a very compressed timeline. In oral and written practices of sericulture in China, the unit of quantity for silkworm is '*zhang*' (张), literally a sheet, which refers to the number of eggs laid on each a4-sized sheet of paper, counting around 25,000 silkworms. Each silkworm needs to consume 20-25 grams of mulberry leaves in its lifetime, and for a sheet of silkworms, farmers have to provide five to six hundred kilograms of leaves in total. The demand for food varies significantly at different stages of a silkworm's life. An ant-sized first-instar larva asks for very few chopped leaves per day, while at its fifth instar, it needs ample leaves for six to seven days in a row. Hence the intensity of a farmer's leaf-picking labour differs with the

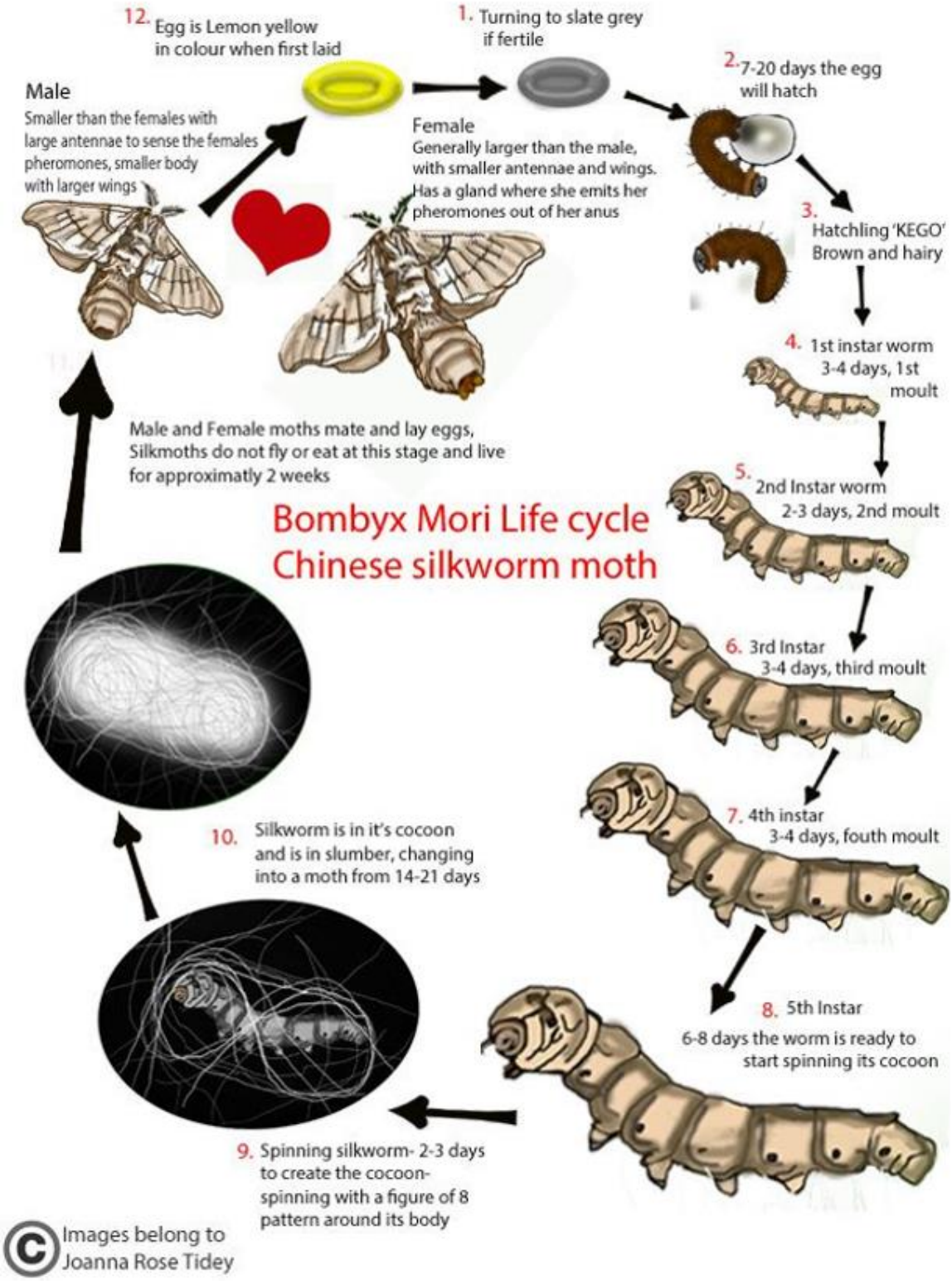

Figure 8: Lifecycle of a domestic silkworm (Author: Joanna Rose Tidley, 2012)

growing pace of the silkworm. Farmers accordingly decide how many sheets of silkworms to keep in each batch, measuring the size of their house and the number of leaf-pickers in a family. In Village X of Yizhou County where I lived for months for doing

Figure 9: Mulberry fields at Village X in Yizhou County, Hechi, Guangxi (Photo: XU Feixuan, 2019)

fieldwork, villagers raised one to three sheets of silkworms per family, with two sheets being the most appropriate and three very burdensome. This is partly because of the overlapping batches in the sericultural practice in Guangxi. When one sheet of fifth-instar silkworms was about to spin cocoons within a household, for example, the family had already started feeding another sheet of third-instar silkworms at the same time. At the busiest time of one batch, a family that hosts one sheet of silkworms needs to pick 100kg of leaves per day and pack them into the rectangular plastic woven bags used to hold chemical fertilisers (fig. 9). Depending on how lightly the bags are filled, one bag of leaves is 10 to 20kg and normally it takes one person more than one hour working in the field to fill one bag (fig. 10).

There are two 'workplaces' for silkworm farmers, namely the mulberry garden in the field and the bedroom for silkworms in their farmhouse. The majority of local villagers in Guangxi keep silkworms within individual homesteads not far away from their mulberry tree lands, and the spaces spared for silkworms are typically the floor of the living room or an empty bedroom neighbouring the bedroom of family members (fig.

Figure 10: Freshly picked mulberry leaves by silkworm farmers (Photo: XU Feixuan, 2019)

11). The labour in the mulberry fields includes fertilising, disease and pest control and, most importantly, leaf picking. Once the mulberry leaves have been transported to the house, usually by a family-owned mini truck, they are cut into strips and fed to younger larvae, while silkworms of the fourth and fifth instar are large enough to chew the whole leaves. Keeping the indoor environment clean is generally considered a household chore, but it is also part of the sericultural labour. As silkworms are extremely susceptible to various pathogens including bacteria, viruses and parasites, a hygienic and well-ventilated room is essential to keep them healthy. However, among all of these tasks in a sericultural worker's routine, leaf picking is still the most physically demanding one.

Silkworm farmers in China today, like their predecessors in pre-industrial ages, still practise hands-on husbandry that has not yet been largely mechanized into assembly lines unlike some other livestock husbandry. The main obstacle lies in the mechanisation of caring for the mulberry trees (Zhao 2005). In the development of sericulture in China, there is not yet enough human and material resources invested in the invention of leaf-harvesting machinery and equipment. Existing leaf-peaking

Figure 11: Farmhouse space for cultivating silkworms (Photo: XU Feixuan, 2019)

machinery cannot distinguish between young and mature leaves in operation; nor can they avoid muddy or yellowed leaves which would contain fatal pathogens for silkworms. Automatic shears can also cut off branches, and thus affect the number of leaves drawn on the trees afterwards. Therefore, in most rural areas in China, mulberry leaves for sericulture are still largely picked by hand.

It should be noted that another route to sericulture automation exists by replacing fresh mulberry leaves with artificial fodder. Research on silkworm fodder has been a significant trend in sericulture science study, triggered by high-end market demand where silk can be the raw material for the production of cosmetics, medical materials (stitches, cytoskeletons and intravascular stents) as well as pharmaceutical proteins. These products have extremely strict quality control standards for ensuring human health and wellbeing. As various microbes and heavy metal elements may be left in mulberry leaves, leaf-fed silk can hardly reach these safety requirements. On the other hand, fodder is much more controllable than mulberry leaves with regard to 'purity' and 'sterility'. Japan therefore witnessed the world's first success in artificial fodder-fed silkworm raising during the whole larval phase in the lab in 1960 (Fukuda et al. 1960).

Figure 12: Second-instar silkworm larvae on artificial fodder in Zhang's lab (Photo: XU Feixuan, 2019)

But, as the industry of raising silkworms for silk fabrics productions in Japan has already shrunk, in recent years small-scale silkworm farm factories have sprung up in the country to produce high-end silk materials, where silkworms live on fodder for their entire larval stage from the first to the fifth instar before cocooning. Fodder-fed silk products can fetch high prices in the market of personal care products and medical supplies, making up for the expensive cost of fodder costs.

It was during my second trip to Guangxi Sericulture Research Centre in Nanning City on April the 4th, 2019 that I interviewed the chief biologist, Mr Zhang, at this institute, who is the leader of a research team on silkworm fodder study. On that day I visited their lab when some biologists there were conducting a comparative experiment on three kinds of fodder made in China and Japan respectively. The tiny second-instar silkworm larvae were kept in lunch-box-sized plastic containers with the man-made fodder laid in the bottom, like a clump of brown moist clay (fig. 12). According to Zhang, fodder-fed silkworms are smaller and produce much finer but thinner silk than those leaves-fed. Thinner silk filament with better purity is less suitable for reeling and weaving into fabrics because it breaks easily on existing reeling machines in silk factories. Moreover, although silkworm fodder is expected to provide essential support

for potential large-scale labour-saving silkworm husbandry without seasonal restrictions, the cost is too high for farmers to make money compared to the current hands-on mode. As he explained:

> '*If we feed silkworms with fodder in their entire larval phase like Japanese scientists did, to harvest one catty of cocoons costs three and a half catties of fodder. The purchase price of cocoons in Guangxi lingers around 20 yuan per pound, while the cost of one catty of silkworm fodder is also 20 yuan. It would not be economical to raise fodder-fed silkworms for traditional silk fabric productions. Should there be a breakthrough in mulberry care mechanisation, it would be helpful to scale up the silkworm husbandry. But it is impossible to make money when you go for scale with the present model such as all-age fodder-fed farming.*'

The biologist further compared the technological 'backwardness' of sericulture from the perspective of industrialization to the heyday in ancient China. Throughout the civilization of China, silk had been a significant vehicle of material culture. It had economic and material importance in the imperial era, facilitating cultural communication and being used to pay taxes. Even during the early years of the establishment of the People's Republic, the country earned foreign exchange by exporting silk, which was then used to buy high-tech weapons and advanced equipment (Zhao 2005). However, the fact that silkworm cultivation remains labour-intensive demonstrates that 'its progressing pace cannot keep up with that of our society as a whole', as Zhang noted, and as silk has lost its previous importance, sericulture cannot return to the past heights.

Sericulture in China can, nevertheless, be regarded as modern as it is deeply enmeshed in the logic of the capitalist market. Although farmers' sharing space in the farmhouse with silkworms indicates affective and physical proximity, their cohabitation and coordination of biological clocks are not immune to the forces of capitalism. The aim of this symbiosis for silkworm farmers is to earn 'quick money' from selling cocoons, an expression I heard many times in interviews and chatting in Village X. The relatively short circle of investment and return of silkworm husbandry corresponds to the whole

life cycle of domestic silkworms lasting merely six to eight weeks. The economic risk of each batch in raising silkworms is thus manageable. On the other hand, local cocoon purchase prices fluctuate with the global raw silk market. The standard of regulating time in this framework is uniform. Synchronized pacing enables easy management, saving in labour and resource input, and hence better accumulation of profit and in the case of sericulture specifically, accumulation of bio-capitals. Farmers, therefore, apply hormones to regulate the growth of silkworm larvae for better efficiency. Although farmers and silkworms are not regulated in a conventional apparatus of unified time management such as those in a factory farm, bodies of humans and nonhumans are caught in the rhythms of the global capital market. However, silkworm cultivation might count as 'premodern' from the perspective of technological progressivism. The silkworm as a domesticated cash animal has colluded with the mulberry tree to resist the tide of alienation in automated farm factories (in Marxist terms) in a capitalist framework. This silkworm-mulberry coalition instead asks for the hands-on care of their human feeders.

Silkworm husbandry hence traverses ancient agrarian practices and modern industrial agriculture. This liminal quality of the sericultural industry has been largely ignored in understanding the critique of the accelerating industrialisation of contemporary society in Liang Shaoji's silkworm art projects. In Liang's installations such as 'The Unbearable Lightness of Being / Nature Series No.79' (2003) (fig. 13) and 'Snow Cover' (2013), iron chains and plastic products signify the burden and redundancy modernity has brought on humanity, while the silk flakes covering those objects carry the power of '*ziran*', denoting a natural, organic, primaeval and harmonious flow (e.g. von Drathen 2011; Xia 2015). The silk-silkworm assemblage works as a symbolic metaphor for '*ziran*' as nature because these critics hold the underlying assumptions of a dichotomy between both natural animals (silkworms) vs. inanimate objects as well as organic material (silk) vs. machine-made products. Nonetheless, as demonstrated above, silk and domestic silkworms contextualised in the current sericulture industry in China should not be considered the antithesis of either industrialisation or modernity, but rather this organism-material combination presents a state of transition, or in Turner's term 'liminality'. It is the awkward relationship between domestic silkworms and their

Figure 13: 'The Unbearable Lightness of Being / Nature Series No.79', 2003 (Photo: ShanghART Gallery)

human cultivators that facilitates Liang's criticism of contemporary society in China. Silkworms are domesticated but silkworm husbandry is not yet automated. Silkworms are domesticated but silkworm husbandry is not yet automated. The circulation of silk has been internationally marketized, but the non-human silk producers are still raised within domestic intimate space in most cases in China. This subtle liminality in silkworm husbandry functions as the ground of Liang's artworks where he juxtaposed silk and other materials for symbolic expression and functional purposes (more discussion in Chapter 2 and 3).

Liang as Cultivator

From 1989 to 2000, Liang spent nearly a decade living in a small village near Linhai City in Zhejiang Province near the coast of Eastern China. While feeding silkworms and growing mulberry trees with local farmers, he observed and learned about the physiological and behavioural characteristics of silkworms through his daily labour. Liang also photocopied textbooks from the sericulture department in then Zhejiang Agricultural University and subscribed to academic journals such as 'Science of Sericulture' to follow up on the latest research findings as another approach to equip

himself with sufficient knowledge. In these early years, Liang took care of his mulberry garden and silkworms by himself and even attempted to build greenhouses for bush-type mulberry trees, hoping to get around seasonal climate restriction on the length of silkworm farming season. However, these were often destroyed due to the high frequency of typhoons in this region during conventional silkworm seasons in late spring to summer. After ten years' intense engagement in silkworm husbandry, Liang's focus shifted more towards art creation and his limited time and energy made it difficult for him to continue juggling the heavy workloads of leaf-picking and worm-feeding as before. Liang then started to purchase mulberry leaves from local farmer acquaintances and hired them to look after the silkworms before the larvae entered the fifth instar to be transported to the artist's studio.

On the night of April 1st, 2019, I talked with Liang Shaoji in his studio in Tiantai County and he shared with me some technical tips from his decade-long agrarian work. The silkworm larvae fed heavily on mulberry leaves during their fifth instar, but Liang noticed that if the leaves were very wet the silkworms would urinate more before cocooning. Feeding drier mulberry leaves then can slightly reduce Liang's workload in creating his art installations as the likelihood of the silk flakes being contaminated with an extra spill of urine would be minimised. Mature silkworm larvae in their late fifth instar in farmhouses climb up to the cocoon frame to prepare for cocooning. As they crawl along, the insects would empty their bodies of urine and faeces while secreting silk filaments before substantially building ellipsoidal cocoons. Even if a very small number of silkworms excreted within the cocoons, those contaminated ones usually do not affect the sold price of the whole batch of cocoons and therefore farmers are not too concerned about silkworms' excretion. However, as Liang planned for the silkworms to spin 'flat cocoons' on planes of various materials, the lightest urine stain would detract from the flawless whiteness of the entire silk flake. Hence the artist would rather waste the initial silk that silkworms had just started to produce. He took great pains to observe each silkworm's body in the light to make sure those larvae had excreted up before placing them on a pre-arranged assembly of objects to be wrapped in silk. 'It all depends on feeling on fingertips and experience,' Liang said in response to my question about how to tell when silkworms' excretion is complete.

The difference in perspective between the artist and the farmer is also reflected in the attentive observation of the movement of silkworms. In Liang's studio, I saw several mirrors on the workbench covered with thin sheets of flat silk cocoons. The bright, clean and shiny surface of the mirror allowed me to easily identify the figure-of-eight trajectory of the silkworm swaying its head as it spun out the single silk filament. I also perceived that the density and texture of these silk flakes on each mirror varied quite significantly. The artist explained why the silk traces take different forms:

> '*The silkworm movement changed over time during its cocooning phase. In the first two days when they just started secreting silk, they were more excited and active, so their heads bobbed more wildly. Later in the cocooning process, they got a bit tired and thus their heads oscillated in a narrower range. The texture of each silk flake on a flat surface will manifest this difference in movement accordingly.*'

Liang also noted an anecdotal episode that happened during his creative process using the 'flat cocoon' technique:

> '*Mr Zheng, the chief biologist at local silkworm breeding station in neighbouring Linhai city, provided me with a lot of support with knowledge and equipment during my artistic experiments with the silkworm, and once he came to my studio for a visit and advised me to pad cotton on the flat plane to absorb the silkworm's urine. We tried, and the cotton and silk flakes resulted in tightly gluing together, even harder to dry and clean.*'

Farmers would not be able to see with the naked eye the movement and metamorphosis of silkworms as the larvae gradually wrap themselves in thicker and less transparent ellipsoidal cocoons in contrast to Liang's flat planes. Liang's acquaintance with the behavioural traits of spinning silkworm larvae on 'flat cocoons' (see more technical details in Chapter 2) therefore could never have been empirically gained by the farmers engaged in traditional sericultural production.

As Liang mentioned, the government-sponsored Silkworm Breeding Station in Linhai provided technical and equipment support for the artist's breeding experiments to fulfil his artistic ambition. At the institute, silkworm scientists conduct breed selection most often to improve the efficiency and productivity of silkworm husbandry. After the theoretical framework of modern sericulture and breeding techniques had been introduced to China from Japan in the early twentieth century, local silkworm varieties kept by farmers were collected by sericultural research institutes across the whole country. After national validation, these 'breed materials' constitute the national breed bank of silkworm varieties which are then selected and improved by scientists to suit diverse production needs of the industry. As a result, there are innate physiological differences between lines or varieties of the silkworm in their responses to various pathogens, known as tolerance or even resistance to a certain disease. A variety with good tolerance to one pathogen means a smaller percentage of infections, less sensitive reactions, or less severe symptoms.

I was told by Mr Zhang during my stay in the Guangxi Sericulture Research Centre that the selection process for disease-tolerant silkworm varieties is measured in years. Breed selection takes too long for the lifespan of a disease-ridden silkworm and it is also too limited and feeble in regard to the history of a species in concert with other organisms. Although the purpose of breeding, in Zhang's words, is to 'solve problems and needs in human's silk production', this antidote is often lagging behind epidemics; it mainly serves a future time, in the name of long-term development and benefit of the industry. If breeding for tolerance to a long-standing enemy like pébrine disease is less urgent and thus seems tardy, the selection work by the biologists for even newer threats in production can also be time-lagged, which is well manifested in the case of the selection of fluorine-tolerant varieties.

Fluoride, an abiotic pathogen of silkworm disease, became a threat to the sericultural industry when the waste gases from the factories containing fluoride dust which fell on the mulberry leaves in the fields nearby. When a silkworm consumes contaminated leaves, the concentration of fluoride in its body interrupts its metabolism, causing black scarring on its skin and then death before pupation and cocooning. Mr Zhang briefly

recollected the history of breeding fluoride-tolerant varieties. Japanese scientists then considered breeding varieties with stronger fluoride tolerance to be raised in areas with highly developed industries where local farmers still needed to rear silkworms. They did find some varieties desired eventually, yet applicable regions with the need to develop both sericulture and industry simultaneously became rare. There are more direct and quicker ways to solve the air pollutant poisoning than through breed selection for tolerance, such as using administrative means to reduce the fluoride emissions or even relocating the factories or mulberry farmlands. More often than not, where the industry is well developed, agriculture is inhibited; factories and mulberry fields do not always exist next to each other.

Nevertheless, fluoride poisoning was indeed a serious challenge in sericulture a decade or so ago in both Japan and China. When I stayed at the artist's workplace in Tiantai, he happened to mention a local fluoride pollution accident he was involved in.

> '*I was living in a village in rural Linhai. Next to the village's farmlands, there was commercial land. New houses were being built over there and farmers went to pick mulberry leaves in the fields beside the construction site. The silkworms all subsequently died. Later I helped the local farmers file a lawsuit for compensation…Our human history is too similar to that of the silkworm*. The d*omestic silkworm has a history of more than three thousand years, about the same as that of Chinese history.*'

Liang's last remark points to the similarities both in length and undergoing transformations in two species' history on the same planet. It suggests that ecological challenges (if not disasters) brought about by modernisation projects have affected not only human communities but have forced animals to adapt accordingly, just as the fluoride case shows. As a pollutant fluoride damages the bodies of humans and silkworms alike, individuals either get sick and die or adapt with better tolerance to survive.

Liang's original aim of breeding selection was to find varieties strong and tolerant enough to be able to spin a 'flat cocoon' on metal which in the artist's view best represents cold-hearted industrialisation and modernity in both material and symbolic terms, as he stated during my interview. To counter the resistance of silkworms to unfamiliar materials such as metal and human skin, the biologist Mr Zheng and his colleagues assisted Liang to hybridize silkworm varieties among breeds in Zhejiang and from other provinces. After a number of trials, Liang eventually selected a few promising 'candidate' breeds with stronger physical strength and higher immunity to continue his artistic experiment. Liang offered more details on his hybridization experiments during the interviews in Tiantai:

> *'I have compared both hybrid and purebred varieties when making artworks and prefer the hybrid ones when dealing with metal materials. Purebred silkworms are more delicate, producing good quality silk but not sturdy enough to climb up high. It is probably like interracial marriage with different genes mixed. A multiracial baby would then have distinctive physical traits.'*

Whether accurate or not in terms of genetic science, Liang's anthropomorphic analogy between hybrid silkworms and people with mixed races tends to emphasize a kind of cross-species continuity between humans and silkworms. For Liang Shaoji, this analogical continuity manifests itself in the adaptive strategies of life in ecological history at the diachronic scale, as in the case of fluoride poisoning, and also in the biological principles at the synchronic scale (see also Chapter 4).

Turning back to Liang's hybridization trials, those varieties with no significant advantages for cocoon production selected from the artist's continuous adjustments in the experiment enabled him to initiate generative encounters between silkworms and different material surfaces and subsequently succeeded in realising his artistic vision. Liang's activities in the laboratory constitute part of silkworm cultivation, i.e., mating and crossbreeding, and at the same time part of his artistic creation. Liang's artistic techniques with silkworms developed throughout his career are pervaded with this

characteristic of making-in-cultivating, or cultivating-in-making, as the following case and latter chapters will further elaborate.

Liang as the Maker

'Do silkworms enjoy music?' I once asked Liang Shaoji when we chatted in his studio at the foot of Mountain Tiantai. Liang didn't answer my question directly. Instead, he shared a piece of his experience in rural Linhai around twenty years ago in the 1990s:

> '*At that time, I lived in the countryside. Local villagers were often listening to Yue Opera on cassette tapes when feeding the silkworm larvae in their farmhouses. I once asked them: "Do silkworms also enjoy listening to Yue opera?" One farmer Liu replied, jokingly: "We delight in it, so do silkworms (我们欢乐，它也欢乐)." Other villagers all laughed and agreed.*'

Yue opera, also known as Shaoxing opera, has been a popular Chinese operatic genre in Zhejiang province since the early twentieth century. Besides occasional live performances, the most accessible ways around the year 2000 to enjoy Yue Opera for people in rural areas in Zhejiang was cassette tapes and music programmes on FM broadcasts.

'We delight in it, so do silkworms' seemed to express how silkworms in Linhai can not only 'hear' but also acquire a similar appreciation of Yue opera as their human raisers do. The lively gaiety in the space was brought by Yue opera melodies, which were usually played on affordable devices such as tape recorders or the radio for local villages. This local taste of music, as assumed by Linhai farmers, can naturally traverse the species boundaries and be shared by all creatures inhabiting the same village. Despite heterogeneous sensing apparatus, the villagers still made a wishful presumption that silkworms can have fun in Yue opera, the same as humans do during their daily interactions in the cultivating labour.

That farmer's expression reminds me of Graeber's (2014) reading of the Daoist story 'Fish's Pleasure' in '*Zhuangzi*'. As recorded in this ancient text, Zhuangzi and Huizi, two Chinese philosophical personae, were debating on the dam whether it would be possible for them to claim that the fish drifting in the river were happy. When questioned by Huizi 'you are not inherently a fish then how can you know a fish's pleasure', Zhuangzi acknowledged his vantage point as 'knowing from my standing on the bridge' instead of diving in the water. Zhuangzi's distanced but reflective positionality, as noted by Cantor, can be understood as a 'species-specific perspective', suggesting 'the limitedness of human knowledge' (2019: 221). Graeber, however, tactically avoids the discussion of execution of empathy across different species but instead turns to the sameness, the ubiquitous activity of having fun 'for the sheer pleasure of doing it': 'We can understand the happiness of fishes — or ants, or inchworms — because what drives us to think and argue about such matters is, ultimately, exactly the same thing' (2014). Silkworms in Linhai, in the eyes of local farmers, are also capable of having fun, and more importantly, capable of having auditory joy in Yue opera. Different from Zhuangzi and Huizi's speculation over other creatures from a certain standpoint, the farmer Liu's expression suggests an affective interspecies sociality: I gain pleasure in Yue opera. You silkworms stay with me in the same space, surrounded by this melody too. I do sincerely hope and believe that you also feel happy as I do. Here the spectre of the ancient Chinese sage Mencius is haunting over the village near Linhai, whose exhortation to the emperor later became a popular Chinese proverb: 'Pleasure (in music) alone is not as good as pleasure for all (*独乐乐不如众乐乐*)'. Sharing is always an affective and engaging practice to firmly bond a relationship even between silkworms and farmers.

The artist was also inspired by this scene and conducted experiments on silkworms' response to music. He intentionally curated the repertoire for his artistic experiment with silkworms. Light music, usually without lyrics, also known as mood or ambient music, is regarded as easy to appreciate and requiring less sophistication. It seems to be less culture-embedded than regionally popular genres such as Yue opera favoured by many villagers in Zhejiang. Liang chose this more accessible form of music (by human standards) in his trials to appeal to a possible wider silkworm audience:

> *'It was nearly twenty years ago when I only had a semiconductor radio, no smartphone. Some "Light Music" programmes were regularly played on the radio. When I fed the silkworms, I placed the radio on the ground beside a rack of bamboo shelves, with pieces of light music live on the broadcast... However, the time span of my attempts was far too short to show any significant result on whether some light music would be of benefit to the silkworm's growth and wellbeing. Even biologists need to carry out a rigorous set of procedures in long-term controlled experiments. A scientifically solid outcome should be backed up by reliable data. It's not that simple for me.'*

Domestic silkworm is very fragile and sensitive to its living environment and susceptible to factors such as room temperature, humidity, air quality, the nutrition of the leaves and various pathogens invisible to the naked eye. It is always impossible for farmers to identify a certain culprit for a batch of poor cocoon yield or their insects' bad health. The same obstacle also lies in the artist Liang and scientists' endeavour to design and conduct experiments on silkworm's musical taste. After a field trip in Zhejiang Province, I conducted an interview with biologist Mr Zhang at Guangxi Sericulture Research Centre and asked about silkworm's auditory organs. I was told that silkworms don't have "ears" to decode the "sound wave", but they can "feel" and react to the vibration in the air by receptors on their skin.

> *'It's more like our human beings' sense of touch rather than perceiving by an auditory sensation, and we still have very limited knowledge on the range of frequency and intensity of sound waves that are detectable by the silkworm. However, we found that when silkworms were eating the leaves and a person knocked on the shelf they were on, the larvae would become so nervous that they would stop eating.'*

Zhang showed unexpected interest in this topic of silkworm hearing and continued to recount a failed experiment that has never been recorded in any Chinese sericultural history book or academic journal:

'In the 1970s and 1980s, some scientists at the Sericultural Research Institute, Chinese Academy of Agricultural Sciences (SRICAAS) did an experiment on whether silkworms' listening to Peking opera can increase the cocoon yield. The result of that project, however, after long and careful deliberation, is still "hard to tell" (不好说).'

The early 1980s is a remarkable period in the history of science in China. The Cultural Revolution began in 1966 and lasted for ten years till 1976, causing a devastating blow to many intellectuals and scholars' academic research as well as their personal lives. In late March 1978, the National Science Congress was held in Beijing where Deng Xiaoping delivered a speech to advocate that 'the key to modernization is the modernization of science and technology'. The event marked the commencement of the 'Spring of Science', an ideological slogan derived from the closing speech title of that congress given by Guo Moruo, the president of the Chinese Academy of Sciences. The recovery of Chinese academia, especially the science community, had gained strong national support in the tide of modernization and globalization boosted by Deng Xiaoping's 'Reform and Opening-Up' policy since the late 1970s. The Sericultural Research Institute in the Chinese Academy of Agricultural Sciences (SRICAAS), founded in 1951, is a national research institute on sericulture located in Jiangsu Province. It seemed not a coincidence that Peking opera was the deliberately chosen genre in an experiment on possible correlations between the music and silkworm's wellbeing designed by Chinese biologists at SRICAAS in the 1970s and 1980s. Peking opera used to be favoured by the Qing court and later gained its state-wide long-lasting reputation as one of the most treasured cultural heritage of China. During the Cultural Revolution, Peking opera had been twisted in forms and themes into 'Revolutionary Operas' by Jiang Qing for the Communist Party's propaganda agenda. The exact years of these inquiries on good cocoon harvest and Peking opera are not identifiable anymore, and hence it is not clear whether the silkworms in the tests were listening to the authentic or converted version of Peking opera. Nevertheless, the design for this scientific experiment can still be reckoned as heavily conveying ideologies embedded in Peking opera in historical contexts.

The correlation between silkworm's health and certain types of music is impossible to be scientifically verified, as there would be far too many interfering elements to do a controlled experiment. Thus, it is hard to draw any solid result. Although an investigation into silkworms' musical preference tends not to be a promising research project within the bio-scientific framework, the motives behind those inquiries mentioned above remain noteworthy. The choices of music genre for silkworms by scientists, the artist and farmers range from culturally loaded Yue and Peking opera to less-serious Light Music. As for the research project at the national-level Sericultural Research Institute, selecting Peking opera for silkworms to listen to, as previously noted, is a mild way to follow the mainstream national ideology at the early stage of the revival of Chinese technology and science study in the 1980s. In Linhai farmers' opinion, silkworms must be enjoying the Yue opera during their mealtimes when their human feeders turned on the radio or tape recorder and sprinkled the chopped mulberry leaves. This piece of local knowledge about silkworms emerged through their everyday practice of intense care and interaction which refuses any trans-local articulation. For Liang, doing an experiment on light music and silkworms' reaction is to go beyond the orthodox genealogy of sericulture study with his artistic imagination and sensitivity; at the same time, according to his own statement, it might also 'open up silkworm's capacity or nature (*蚕性*)' to appreciate some music composed by human beings. For an artistic trial, a lack of significant difference does not mean a failure of an experience, as a 'scientific failure' can serve as another 'result' to ponder on for further artistic creation.

The unresolved artistic experiment with music and silkworms did not stop Liang Shaoji's meditation on auditory sensation and this insect, but years later, he took a path of the opposite direction to address this issue in 2006. If silkworm's response to music is inaccessible to human knowledge, humans can stop for a while and listen to the 'music' made by silkworms. '*Listening to the Silkworm / Nature Series No. 96'* is a sound art installation that invites the audience in the gallery to wear headphones and listen to the voice recordings of silkworms' chewing mulberry leaves and also spinning silk filaments. This art project was first launched in RNC Art Museum (Nanjing, 2006) and later in Zendai Museum of Modern Art in Shanghai (2009), as wel as the True Colour Museum (Suzhou, 2010) and Hayward Gallery (London, 2012). In the last two venues,

Figure 14: 'Listening to the Silkworm / Nature Series No. 96', 2006 (Photo: ShanghART Gallery)

live silkworm larvae were transported into the gallery space and the sound of silkworms' chewing mulberry was also transmitted directly into the audience's headphones with the pre-recorded audio tracks (fig. 14).

At the 2nd Wuzhen Contemporary Art Exhibition in March 2019 where Liang's artworks were displayed, he delivered a speech on his whole artistic voyage with silkworms. Liang described how he recorded the sound of silkworms at his studio in the village near Linhai and explained the nuanced variations in the sound recording:

> '*Late at night, the room was filled with the sound of hundreds of thousands of silkworms spinning silk. It sounded like the falling raindrops, the babbling brook, in a mood of ancient Chinese landscape ink paintings. It is breath-taking. I tried to record this collective sound around midnight as it was the most silent period of time in the village. People were asleep, but dogs occasionally barked which jumped into the pure sound of silkworms. I had to restart my recording work again and again… The sound of silkworms' spinning can be divided into two types: the moment when the silk is secreted out, and the sound when the silkworm glues two silk threads together, resembling the sound of plucking strings.*'

Attending this exhibition, I noticed with surprise that the backstage story of this sound artwork was almost identical to a piece of my own fieldwork experience. I, too, when first standing in a room full of fifth-instar silkworm larvae biting the leaves, was struck by the clear, constant rain-like poetic chords. I took out my voice recorder from my pocket, a convenient device I always carried to record my interviews with villagers in Yizhou County. It was in the daytime, so the soundscape outside that small room for silkworms was much more turbulent and vigorous than that at midnight. Bird's call, dog's barking, the roaring of a motorcycle engine, and a child's crying randomly joined the chorus, but I was not annoyed by the hubbub of these uninvited matters. Unlike Liang, who might need a purer and more ethereal audio track to involve the audience in the meditation on the silkworm alone, I recorded the sound in situ just to recall this moving moment for myself and maybe later, to share it with more people who would not be unable to listen to this tranquil 'music' live. Hence, I don't mind the messiness, the entanglement of different pitches and the lively energies surrounding the silkworms and myself that were being documented in my voice recorder.

It is interesting to note when sericultural science didn't provide a satisfactory answer to Liang's artistic inquiry on silkworms' auditory sense, he turned to ancient Chinese philosophy to seek cultural nourishment on this topic. Liang confessed to me that he felt close to Daoist thought and pursued the spirituality of '*Tian-ren-he-yi*' (天人合一), 'the integrity or oneness of humanity and heaven/nature' in his art creation. In his artistic statement for 'Listening to the Silkworm', Liang (2014) emphasizes the Daoist

maxim 'the ultimate principle is to follow the way it naturally goes (*dao* follows *ziran*)' that is underlying this project and claims that he had practised this principle in his sound recordings of silkworms' eating leaves and spinning silk. Although Liang would wait for the sudden barking of the village dogs to cease, again and again, before pressing the record button, he did not manipulate or process the original sounds made by the silkworms. The artist (ibid.: 7) also compares his own approach to John Cage's artistic performance '4'33' (1952), where during the four minutes thirty-three seconds of performing this 'silent' composition, musical performers do not play their instruments so that the audience listens to the sounds of the environment they are seated in. As Liang expounds, 'Cage's work was performed in an unnatural and abrupt way. It was to disturb, distract, urge and confuse the audience's attention. There are forces of compulsion or even coercion behind "4'33" that contradicts "the way of *ziran*" (*自然之道*) worshipped in Chinese Daoism' (ibid.). Contrary to Cage, Liang did not alter the soundtrack or change the environment in and outside his studio. Liang just waited with patience till the dogs and frogs in the village closed their mouths, and then he could turn the microphone to silkworms, the designated soloists for this art project.

While the ancient Daoist philosopher Zhuangzi proposed in the 4th century BC that you 'listen with your heart, not merely with your eyes' (无听之以耳而听之以心) , a contemporary anthropologist Ingold (2000: 285) articulates a parallel concern that humans should not only make sense of the senses as cultural constructions of sensory experience, but should dwell in the environment, sense the world, and make sense of ourselves to others. Silkworm and humans do have 'auditory' experience though with divergent sensory apparatus and thus as cohabiting partners can listen to ambient sounds together such as the Yue opera or light music. Meanwhile, they might listen to and correspond to each other, as in the artwork '*Listening to the Silkworm*' the gallery audience were invited to put on headphones and listen to the unfamiliar sound made by the tiny animals they thought they were familiar with. The way Liang was making audio tracks in the village he lived in for this project was natural and spontaneous compared to the counter-intuitive and counter-routine strategy in '4'33', as silkworms being recorded did not have to make extra effort to produce 'silence' or any uncanny

sound but just eat leaves and spin cocoons. Despite that, the process of preparing this soundtrack can be regarded as artificial, unnatural and manipulating. Unlike the rowdy polyphonic voice recording made during my fieldwork in rural Yizhou, the artist deliberately stripped away the noises made by other creatures as the ambient sounds of the village near Linhai where silkworms and the artist jointly inhabited. The finished recording of silkworms' solo is thus purified out of its context to create a more abstract, airy and spiritual aura. Again, the artistic strategies employed by Liang here blurred the technical boundaries between cultivation and making, between '*ziran*' as spontaneity and determined interventions.

Techniques of Making and Cultivating

In art criticism, both aesthetic and semiotic readings of Liang Shaoji's artworks (e.g. Gladston 2011; Xia 2015; van Drathen 2010) focus too much on the finished art projects at the expense of the processes, such as the intense silkworm cultivation labour and biological crossbreeding experiments delineated in this chapter. It is also largely neglected in interpreting Liang's art that silkworm husbandry in China sits at the liminal point among highly mechanised modern agriculture, the global silk market, the family farming model, and hands-on personal cultivation. This leads to the erroneous assumption that domestic silkworms and the silk they spin represents a primaeval and intact state of '*ziran*' uninfluenced by accelerated progressivism and thus in Liang's art projects form as the direct antithesis of industrialization, modernity or alienation in the capitalist system.

Such overwhelming concentration on the final objects echoes Ingold's criticism of anthropological studies of material culture which spotlight what happens as artefacts 'become caught up in the life histories and social interactions of the people who use, consume or treasure them' but neglect the ongoing processes that bring the artefacts themselves into being (2013: 7). As for the silk-silkworm compound in Liang's works, the growth of silk and silkworms and the artistic techniques to interact with this species are effortlessly concealed by the end presentation of art installations and performances. The attention of both art critics and the audience are too often attracted by the finishing moment, the objective, or the fulfilment.

Although in 'posthuman' literature, terms such as nonhuman and hybrid have become fashionable, as Ingold and Hallam (2014: 16) notice, the artefactual is privileged over the organic, and moreover, the techniques of making is over growing in academic discourses on materiality. They thus offer a more insightful framework to understand myriad and fluid relations between organisms and artefacts to dialectically analyse the processes of 'making' and 'growing'. Making has been compared to 'a rite of passage' (cf. van Gennep 1909; Turner 1969), when a thing undergoes ontological transformation by the maker's agency and crosses 'a threshold' from preparation to employment (2014: 2). The material has been removed from its former settings to the studio or workshop to be processed, and then it moves and reincorporates into a new phase of life. Growing, on the other hand, is material accumulation to incorporate substances into a being's body as a process of 'self-making or autopoiesis' where the grower contributes to 'setting up the conditions' to make sure the growth can proceed (ibid.: 3). From this perspective, the techniques of cultivating silkworms and the process of making art in Liang's practice, as portrayed above, is never radically split apart.

In raising and feeding silkworm larvae, Liang gained great physical support from local farmers in Linhai village. While crossbreeding stronger varieties, biologists also have assisted Liang in the lab operation. Silkworms hence were co-grown by farmers, scientists and the artist together before they were moved to the artist's studio in their fifth instar. Within the art studio, 'a rite of passage' of both the silk and the silkworm took place. Silkworms left the agricultural context where they were supposed to produce cocoons for sale but instead entered into an 'art nexus' in Gell's terms as the prototype of silk threads. Silk threads, too, also experienced a morphological transformation to participate in constituting art installations in the shape of the flat cocoons.

It can be said that Liang as a grower had set the conditions for the silk to grow, accumulate and extend on other objects in his artworks while he also acted as a maker to foster a transition of silkworms' social role with humans. Such ambiguity in Liang's making-in-cultivating techniques, therefore, confounded the divisions between processes of making art and cultivating silkworms, generating and production,

organisms and things. It remains an issue whether Liang's art skills and strategies are consistent with the Daoist maxim 'to follow the way it naturally goes (*dao* follows *ziran*)' that he claims to adhere to. The next chapter will scrutinize more on liminalities in his art-generating processes by evaluating the specific technique of producing 'flat cocoons' to further address this question.

Chapter 2: Experimenting with the Flat Cocoon Technique

The visual-material pattern of the 'flat cocoon' dominates most of Liang Shaoji's art installations where thousands of silkworm larvae directly secrete silk filaments on pre-arranged materials covering them with cloud-like white semi-transparent silk flakes. Everyday discarded objects such as plastic cups, cigarette packets and a keyboard are encased in silk in 'Snow Cover' (2013-2014). Meanwhile in 'Time and Permanence' (1992-2018) over a larger time span, batches of silkworms spun silk over pieces of pyramid-shaped barbed iron wires and previous layers of silk flakes over decades (fig. 15). Other installations have more specific referential implications. Miners' protective headgear and headlights in 'Helmets' (2004), for example, are intended to memorialize those who died in China's frequent mining accidents in recent years. 'Wenchuan Stones' (2014-2016) adopted a similar artistic 'syntax' where Liang transported the rubble from the ruins of the Wenchuan earthquake in 2008 to his studio to be enfolded by 'warm and soft' silk as a gesture to 'caress the wounds and comfort the afflicted', as Liang told me. Liang is concerned with not only social and environmental issues in China, but also international affairs as exemplified in the large-scale installation 'Destiny' (2012-2014). This work is set against the backdrop of marine pollution and the Gulf War (Xia 2015) composed of silk-bounded oil barrels and iron plates resembling the wreckage of sunken ships. Additionally, Liang has two performative artworks namely 'Self-roped' (2000) and 'Cloud Mirror' (2007) where the implementation of the flat cocoon technique also pervades. The visual presentation of silk flakes as the wrapping material in these artworks, according to many art critics (e.g. von Drathen 2011; Yang 2018; Zulueta 2016: Xia 2017), represent the force of '*ziran*', a healing, comforting, protective and energising power from nature. Nonetheless, how such a metaphoric relationship between silk and '*ziran*' can be validly established in Liang's artistic expressions is still under-examined when these projects are categorised and interpreted as 'installations' and the audience's attention is thus driven to the finished art objects (see Chapter 1) rather than the generating processes before their entering into exhibition spaces. This chapter will pave the way to address this gap by first closely examining the details of the 'flat cocoon'

Figure 15: 'Time and Permanence', 1992-2018 (Photo: XU Feixuan, 2018)

technique, whose artistic application contrasts with its employment in agricultural contexts. The artist's failed experiments with hormones to alter the visual characters of flat cocoons and his successful trials on testing various materials as surfaces for silkworms' cocooning will then be reviewed in regard to the Daoist principle of spontaneity and non-assertiveness.

The Flat Cocoon Technique in Sericulture

Silkworm cocoons are ellipsoidal in normal circumstance, though under human intervention, cocoons can also be flat. Cocoon-making is to protect the silkworm during its metamorphosis from the stage of larva to pupa, as the pupa loses its mobility and therefore is more vulnerable to natural predators such as bees, birds and beetles, or pathogens carried by other insects in the wild. Hidden in an ellipsoidal cocoon shell, the pupa can more safely survive into a silkworm moth from the adversities of being eaten or getting ill. When the pupa becomes a mature moth, it will secrete proteolytic enzymes that can dissolve the glue wrapping the single silk thread as a cocoon and fly out. The empty cocoon left with a hole is thus destroyed into silk segments that are

impossible to be reeled into long and fine silk filaments, resulting in their much-reduced economic value in silk fabric production. Domesticated from wild silkworms, they are often kept in farmers' farmhouses in Guangxi, China, where the threat of natural enemies becomes less lethal. Still, silkworms in thousands of years' sericultural husbandry retain their biological instinct to make ellipsoidal cocoons. Silkworm farmers have invented many tools to place mature fifth-instar larvae who are ready to secrete silk, varying from straw stacks to woven bamboo shelves and wooden lattice frames. The prepared silkworms will shake their heads in a figure-of-eight trajectory to choose a preferred narrow three-dimensional space to plan their cocooning strategies by locating the pivot points and pinch angles, and then spin silk threads from the outer layer to wrap themselves.

The cunning trick to induce silkworm larvae to instead spin 'flat cocoons' is to place them on a flat plane during the whole silk-secreting period where silkworms can find no pivot to make conventional ellipsoidal cocoons. Although it would be a strange or even worrying situation for a silkworm larva wandering on a level surface, the insect has no other choice but to produce silk regardless. One physiological principle of cocooning is the excretion of excess amino acids from the body of silkworm, which is the main ingredient for silk proteins, which means that silkworms otherwise would be poisoned to death if those various amino acids were not excreted within the given time. Silkworm husbandry already takes advantage of silkworm's excretion capacity, but the 'flat cocoon' is a much more extreme case of exploiting silkworms' biological traits where humans set up an 'unnatural' condition for silkworms to grow and produce. The technique was first applied in the silk industry in 1984 by Huang Canqi, the chief biologist of Chishang Sericulture Centre in Taiwan (Zhao 2005). Huang invented a wire mesh frame with very fine grids hanging at 30 degrees, where five to six hundred larvae can climb and spin flat silk. By adjusting the angle of the frame's inclination, a uniform thickness of the silk pieces can be guaranteed while the inclined flat plane makes it easier for the spherical granular droppings of the silkworm to roll down to the ground. The silk flakes spun on flat planes are then be used to make silk quilts after simple degreasing and degumming processes, while conversely, traditional ellipsoidal cocoons need to be cooked, reeled

Figure 16: A spinning silkworm larva peeing outside the cocoon frame (Photo: XU Feixuan, 2019)

and then degummed before being processed into silk quilts, which is more time-consuming and labour intensive.

The actual implementation of this technique, however, was not as easy as it sounded. Climbing on inclined surfaces is dangerous for silkworm larvae as they would be more likely to fall off. Moreover, as silkworms will drain their bodies of faeces and urine before secreting silk to build cocoons, in normal sericultural scenes, the larvae's excrement will fall down through the space between hanging lattice frames without contaminating the ellipsoidal cocoons within each separated box (fig. 16). Nonetheless, when a large number of mature fifth-instar silkworms are placed on level surfaces regardless of whether their final excretion was completed or not, it is impractical for human workers to check the worms one by one. This uncertainty poses the risk of the white flat cocoons being contaminated with silkworm excrement. Though some farms in Taiwan later developed roller-shaped equipment to reduce the chance of silkworms falling and silk being spoiled, intense attention from human keepers is still required during the production of flat cocoons. Spinning larvae are phototropic and therefore move towards light. The rooms for making flat cocoons hence are always kept dark to ensure that

silkworms are evenly distributed on the flat plane and thus the silk flakes are evenly thick. Farmers, however, have to spend long hours with the silkworms during the five or six-day silk-secreting phase, picking up the fallen worms and adjusting their density.

The advantage of using the flat cocoon technique in making silk quilts is that it can significantly reduce the industrial wastewater from boiling ellipsoidal cocoons and degumming silk threads. Extra chemical treatments as potential pollutants are also required to process round cocoons into silk quilts. Comparatively, turning flat cocoons into quilts by lye degumming is much simpler and less contaminating to the environment. Moreover, boiling ellipsoidal cocoons containing silkworm pupae inside tend to leave the smell and impurities from the worms on the silk, but the flat cocoons allow silkworms to moult and metamorphose into moths elsewhere after spinning silk threads and subsequent pupation. Silk quilts made from flat cocoons, therefore, are regarded as fluffy, soft and aerated, with an additional economic advantage of leaving intact silkworm pupae for possible processing into food commodities. Nonetheless, the sericulture industry in Taiwan has been decimated from its heyday of the 1970s, as Japan turned to mainland China to buy cheaper cocoons and raw silk since the early 1990s. The Taiwan government no longer provided state support to this industry and instead subsidised silkworm farmers turning towards other trades. Only Chishang Sericulture Farm and a few other farms in Miaoli County survived from the decline of sericulture in Taiwan, keeping the key technique of applying flat cocoons in silk quilt production. The 'flat cocoon' technique was also imported and adopted by some companies in mainland China to make silk quilts and surface materials for calligraphy and painting, but never replaced the mainstream ellipsoid-shaped cocoons in the silk industry.

The Flat Cocoon Technique in Art

Liang Shaoji has largely used this flat cocoon technique in his silkworm artworks. Despite his artistic visions being far removed from producing silk quits, Liang shares the same worry about the excrement contamination on silk flakes when making most of his projects. Flat silk pieces should ideally be white, light and thin to achieve a visually ethereal presentation. The artist, therefore, has to devote as much care, attention and physical effort as silkworm farmers do to ensure the flat cocoon making processes will

be carried out in accordance with his expectations. To check whether each silkworm has completed its last excretion before making flat cocoons, for example, the artist needs to stay up all night by the fifth-instar silkworms as they are about to secrete silk so that the flat silk flakes on his semi-finished art installations can be pure and spotless (also in Chapter 1). A cocoon consists of only a single continuous silk filament. This fibre is made from a fibrous protein 'fibroin' in the core wrapped by glue proteins named 'sericins'. The sticky silk glues function in the formation of a cocoon by gumming the silk fibres together. Even the flat cocoons used in the production of silk quilts are subject to a degumming process, but Liang confirmed that silk flakes on all of his installations that have been openly exhibited have not been degummed:

> '*I did comparative experiments. Degummed silk threads can be extended and elongated, perhaps allowing for more variation in shape, but they are no longer as lustrous as before. The silk loses its gloss. Silk threads keeping their glue have a certain stiffness and are more likely to retain their original shape. Once degummed, they became too soft like a thin cloth. Hence I don't do much degumming of flat cocoons in my works.*'

For these reasons, to guarantee the flawlessness of the flat cocoons and their position and density in his artworks, Liang's daily schedule during the cocooning phase is very irregular. Staying up late during Liang's art processes has messed up his biological clock and damaged his health, the artist told me. However, the implementation of the flat cocoon technique not only affected the health of the artist but also has exposed the silkworms to a tougher environment to survive and secrete silk. While exploring the behavioural characteristics of cocooning larvae on flat planes, Liang also noticed a phenomenon that silkworms who secreted flat cocoons and went through pupation in the open air without the protection of ellipsoidal cocoons were less likely to complete their metamorphosis into adult moths and died abnormally. Liang worried about what he observed and hence went to Zhejiang Agricultural University to discuss with biologists in the sericulture department. Silkworm biologists who are less interested in the visual and material potentials of flat cocoons in art are instead concerned with the physiological conditions of the 'naked' silkworms on flat surfaces, namely their

sensitivity to the environment, susceptibility to pathogens and the sharply reduced proportion of completed metamorphosis into moths. I asked Liang whether he obtained satisfactory answers from the experts. The professors were surprised, as Liang recalled, as the health of silkworms on flat cocoons was supposed to be a doctoral-level research topic in biological studies and Liang, as an artist, was unexpectedly knowledgeable about it. As both the artist and biologists have recognized, leaving silkworms 'naked' to spin flat cocoons against their instincts has posed challenges to their physical health. As Liang explained:

> *'I think it was because they are more vulnerable. Without the protection of cocoon shells, pupae were more likely to be bitten by flies and mosquitoes, and then they didn't moth but instead died. Spinning larvae after being bitten would also stop secreting silk.'*

Besides, the practice of the flat cocoon technique might also bring possible negative effects to silkworm's mental state, an empathetic assumption made by the chief biologist of Guangxi Sericulture Research Centre, Mr Zhang. When chatting in Zhang's office, he pulled open a drawer and showed me two samples of flat cocoons, one purely white and the other in vibrant yellow (fig. 17). The yellow silk was spun by a wild silkworm strain found in the autonomous county of the Yao ethnic group in Nandan, Guangxi province. The differences in colour and texture between the two silkworm varieties were much more conspicuous to the naked eye in the form of flat cocoons. As Mr Zhang put it:

> *'When silkworms were spinning on a flat plane, they would probably feel very uncomfortable and unsafe. Silkworms make cocoons to shield themselves, rather than produce silk. Their eyes are susceptible to light, and they move according to the layers' transmittance inside the cocoons to make sure the shell will eventually become evenly thick. Silkworms adjust their moving direction according to the to the light intensity within the cramped space inside the cocoon and then secrete silk filaments to seal up thinner areas and thus block the light as well as germs and*

Figure 17: Flat cocoons in two colours in Zhang's lab (Photo: XU Feixuan, 2019)

natural enemies. When spinning silk on the flat plane they must be unbearably distressed; they must think they failed to build a good and safe house to pupate.'

In the scenarios of both silk quilt production and artistic creation, the application of the flat cocoon technique needs to be implemented in total darkness or a room with a evenly distributed light source. The ready-to-spin silkworms on a level plane will be deceived by the deliberately settled light conditions. There is neither any clue for them about the directions to move towards nor a fulcrum point to locate a three-dimensional space to create an ellipsoidal silk shell to reside. Zhang's anthropomorphic suspicion of the naked silkworm's mindset and emotional state cannot be scientifically verified but vividly points to the artificiality of light sources set according to the physiological characteristics of silkworms. The artist's conscious manipulation of the environment for the generation of flat cocoons is clearly contrary to silkworm habits, or natural instincts, a scene of intervention that could almost be considered the antithesis of the Daoist spirit advocating non-action and spontaneity. When the larvae had completed their mission of secreting silk in the flat-cocoon shape on various materials in Liang's art studio, they metamorphosed into pupae and were no longer of any use to the artist. Subsequently, they were left aside, some turning into moths and others dying for unknown reasons.

Nonetheless, Liang had already realised that he was placing these insects at a higher risk than in an ellipsoidal cocoon, and hence asked biologists for advice on the possibility of lowering their chances of dying halfway. Although this effort to reduce damage was temporarily futile, Liang was at least aware that his employment of the flat cocoon technique not only brought significant material transformation to silk threads in form but also forced silkworms to undergo discomfort at physical if not mental level.

Interlude: A (Failed) Trial with Hormones

The artificiality in Liang Shaoji's artistic experiments with the silkworm is foregrounded in his two encounters with hormones while raising silkworms and making art with the flat cocoon technique. For silkworm farmers, if the worms within their farmhouses were not all only healthy but also growing at a neat rhythm, namely moulting, cocooning and metamorphosing at almost the same pace, they then would be able to stop feeding with mulberry leaves at a specific point in time and then harvest the maximum amount of cocoons a few days later at another fixed moment. This temporal neatness saves time and labour as farmers won't need to bother waiting and caring for the silkworms that deviate from the speed of the majority. To meet the need for synchronicity in silkworm farming, silkworm biologists found hormone treatments as the antidote. There are two key signalling hormones in silkworms' metamorphosis from larval to pupal stages. Ecdysteroids accelerate the moulting speed of the silkworm, while juvenile hormones, known as JHs, maintain the insect's larval phase and their decline is essential for eliciting the transformation of a silkworm from larva to pupa (Hiruma and Kaneko 2013). This pair of hormones work on quite the opposite principles and they are widely used in agricultural practice to regulate the developing tempo of silkworms.

The artist has his unique experience in tackling the silkworm hormones hands-on when he raised silkworms in rural Linhai in Zhejiang. Ecdysteroids are responsible for regulating the moulting process of an insect in its larval period, whose deficiency or excess might lead to abnormal development or even death. In sericultural practice, using this hormone helps increase the moulting pace of silkworm larva for upcoming metamorphosis into pupa; for a larva which is about to fully mature, an increased concentration of moulting hormones in its body will shorten the preparing time for its

morphological transformation and thus it would be ready for spinning a cocoon more quickly. Ecdysteroids would not act by contact with the insect's body surface but only via ingestion, and thereby they are manufactured into a solution packed in a boxed vial and then sold to farmers as a common 'veterinary drug'. The instruction manual advises that when it is observed that some of the silkworms in the same batch are mature enough for cocooning, the farmer dilutes a vial of ecdysteroids solution with about 2.5l water for one sheet of worms (about 25,000) and spray evenly on mulberry leaves before feeding them to the worms. Ideally, the silkworms falling behind will be accelerated to catch up with the majority, so that the whole batch will be prepared to climb up the cocooning frame to secrete silk in synchronized time after this hormone treatment.

The artist's story with hormones started with an ecdysteroids overdose accident. In Liang's years of experiments on the flat cocoon technique and the suitability of different materials as surfaces, mirrors were among the tested objects. During my visit to Liang's studios at Tiantai, I saw several mirrors on the shelves covered with a thin and filmy layer of silk threads spun as a flat cocoon. Zooming in on those patterns of the silk pieces on each mirror, it was not hard to recognize that the traces of those fibres are arranged in continuous figures of the number '8' overlapping each other (fig. 18). 'Figure-of-eight' is an accurate but rough behavioural description of silkworms' habits as well as a generalisation of the visual traits of silk traces secreted on flat planes. The size and width of those 'eight' patterns, however, can subtly vary depending on individual silkworm's variety, size or health condition. Liang not only has recognized those nuanced variations but also noticed some exceptional deviant 'eights'. The first time Liang encountered an aberrant shape spun by a batch of silkworms was many years ago when he was staying in Linhai village. As Liang recalled, he once fed silkworms with moulting hormones, the ecdysteroids, before they started to cocoon as a normal step in silkworm cultivation practice for a neater growing pace. That time he got the dose wrong quite by chance. Liang was surprised to detect that after the mistaken overdose of ecdysteroids, the amplitude of those spinning silkworms' head oscillation changed significantly, and as a result, the flat cocoon secreted on the mirror took on a much wider shape of '8'.

Figure 18: Silk traces in the figure of '8' on a mirror (Photo: XU Feixuan, 2019)

For farmers, an overdose of ecdysteroids would lead to a reduced income due to the thinner cocoon layers counting as poor-quality as the larvae were accelerated into the silk-secreting stage and did not manage to consume enough mulberry leaves prior to making cocoons. The quality and selling price of ellipsoidal cocoons, nonetheless, is not the artist's concern. Instead, out of an artist's sensitivity to visual elements, Liang was excited by this 'novel' shape of the figure eight which was triggered by his accidental application of hormone. Liang then decided to feed subsequent batches of silkworms

with an overdose of ecdysteroids as an attempt to repeat the result of abnormal silk traces. However. to Liang's puzzlement, the awkward fatter shape of '8' resembling brass plates never reappeared despite his persistent trials.

Liang's second unexpected encounter with such strangely shaped silk traces is related to juvenile hormones which work in the opposite principle to the ecdysteroids on silkworms. The role of JHs is to maintain the silkworm in its larval stage from transforming to a pupa. At the end of a silkworm larva's fifth instar, JHs fade away in its body before cocooning and pupating. JH and its homologues have been widely employed in modern agriculture as a new generation of pesticides. Traditional pesticides applied in agricultural practice contain chlorine, arsenic and organophosphates such as dichlorvos acting as nerve agents to kill unwanted insects in the field. Long-term exposure to these chemicals can easily result in poisoning to humans. New generations of pesticides are less toxic (to humans), and their chemical composition and structure have changed considerably with different working mechanisms. As one of the main categories of new generation pesticides, hormones achieve the goal of insect control by affecting their energy metabolism and substance synthesis, JHs being the most commonly used of this kind. When JHs are intentionally applied to insect larvae, they would pupate abnormally and die. Adult moths treated with JHs pesticide would not be able to mate and lay eggs whereas eggs laid by poisoned female moths will fail to hatch. For sericultural practitioners, however, JHs can be a fatal threat.

When I was talking with biologist Mr Zhang in Nanning on silkworm hormones, Zhang highlighted the fact that seventy percent of all pests worldwide in agricultural farming belong to the order lepidoptera, and the domesticated silkworm is one of the most comprehensively studied. The misfortune of silkworms lies in the indiscriminate attack of hormonal insecticides on the entire lepidoptera insects. The working mechanism of JHs applies to the whole lepidoptera order where they do not poison insects to death literally but prevent worms from undergoing metamorphosis and completing their life cycles. Silkworms in sericultural practice though are not the original target of hormonal

pesticides but have frequently been the innocent victims of wider agricultural pest control measures. Zhang told me how this tragic misadventure occurred:

> *'In pest control, not only have pesticides been upgraded, but the way they are sprayed has also developed. In the past, farmers carried barrel-sized spray pumps on their backs to apply drugs while walking in the field, and later they drove sprinkler trucks around the farmland. More advanced types now spray from aircraft. Once the height has gone up enough, the radius of applied pesticides becomes much wider, though at the expense of losing accurate focus on the targets. If there is a mulberry plantation near the farmland targeted for hormonal pest control, the mulberry leaves were likely to be contaminated with hormonal pesticides. As the concentration of JHs is not high, silkworms consuming the tainted leaves would not die immediately, but their larval stage ensues till the end of their lifetime, no longer cocooning or pupating anymore. Therefore, JH insecticide has turned into a major crisis for the sericultural industry despite the fact that they have helped the mankind in other agricultural practices.'*

The crisis caused by JH insecticide is so prominent in silkworm husbandry in China that even the artist Liang had come across such a mishap in his art-driven silkworm cultivation practice. It had been several years since Liang first encountered silk traces of the fatter figure of '8' shape. In 2018, he accidentally met the atypical eight-shaped again which he had failed to repeat by controlling ecdysteroids dosage in past experiments. Liang recalled the incident when we were talking in his studio in Tiantai:

> '*Last spring, I was raising silkworms in the countryside of Linhai. I was too old to cultivate many silkworms alone, so some local farmers came to help me pick mulberry leaves and feed the worms. Then there was one batch of silkworms that ate the leaves but did not spin cocoons at the expected point of time. The farmers noticed the phenomenon and were very anxious. One came to me ashamed and said: "I'm so sorry Mr Liang, but it seems that all the silkworms are dying." I didn't know what happened at that moment but informed the farmers not to dump the anomalous silkworms. I just couldn't bear to throw them away. I drove to the*

farmhouse immediately and stayed in the village for a whole day, picking out the silkworms that were still struggling to stay alive. I then took almost five hundred living silkworms back to my workshop in the neighbouring Tiantai county and placed them onto two pieces of mirror.

I waited a few more days and some of the silkworms unexpectedly started spinning. More surprisingly, the silk traces spun on the mirrors shared the same wider shapes with those triggered by overdosed moulting hormones which I had been looking for over the years. Although the silkworms' heads still oscillated along a figure-of-eight course, the sway became noticeably larger and they looked like a human suffering severe cramp. The overlapping strands of threads on the plate thereby formed circular silk pieces. Even weirder, these silkworms who finished spinning flat silk cocoons did not transform into moths eventually but stayed in their pupal stage till death.

This time, a similar scene reappeared in front of my eyes, but I had no clue why it happened. To solve my confusion, I took photographs of those abnormal silkworms and the silk they spun on the mirrors and sent them to the experts at State Key Laboratory of Silkworm Genome Biology in Southwest University in Chongqing. Silkworm biologists there hadn't come across anything like this and couldn't give me an explanation. I then went back to ask the farmers how the mulberry leaves were picked. They remembered at that time the temperature was so high that some leaves in their own mulberry plantation had wilted and there was not enough food for their fifth-instar silkworms with a huge appetite. The farmers then turned to their neighbours for help and picked a few bags of leaves in their neighbours' farmlands nearby. I tracked it down and found out what went wrong. The land next to the neighbour's mulberry garden has peanuts grown there, and the peanut field had just been sprayed with pesticides during that period of time. Moreover, the drains in the peanut field were connected to the mulberry garden. So that batch of freak silkworms should have been poisoned by pesticides.'

Liang didn't specify which kind of pesticide was the chief culprit, but by that time I was able to complete the final piece of this detective story puzzle on my own. 'Eating mulberry leaves all the time but not spinning cocoons' and 'forming cocoons without complete metamorphosis' are too obvious clues of an overdose of JHs. The symptoms presented to the biologists in Chongqing spotlighted the worms' wildly swinging heads and the round-shape pieces of silk they spun. Besides, the inability of silkworm pupae to complete the metamorphosis process after spinning flat cocoons is one of the negative consequences of implementing the flat cocoon technique even without the interference of hormones. These might be the reasons why experts failed to provide Liang a scientific answer. As for Liang's failure to repeat the targeted result by applying the ecdysteroids in experiments, I found a possible explanation in my conversation with biologist Zhang on the ecdysteroids' counterparts, the JHs. Besides functioning as pesticides, I also learnt from Zhang that JHs used to be applied intentionally to silkworms in sericultural trials. Precisely controlled doses of JHs can prolong the larval stage of a silkworm and delay its pupation as a means to increase the cocoon yield. When the larvae's fifth instar was extended two more days, as Zhang noted, the worms ate much more leaves and secreted thicker cocoons with five percent increased weight. The prolonged process of energy accumulation can convert more proteins in mulberry leaves into silk proteins. However, JHs as a hormonal treatment has never been promoted and used widely in silkworm cultivation, because the correct dose of JHs to be applied is not easy for farmers to learn and handle in practice. As Zhang explained, silkworms are particularly sensitive to hormones, and if the dose of was JHs exceeded, there would be a risk that silkworm larvae simply would not cocoon anymore. In addition, a two days' delay of maturation to increase the silk yield by 5% means two more days' leaf-picking toil. Considering the cost of labour, applying JHs might not count as cost-effective and worthy to try for most farmers. To achieve a specific outcome by using hormones without affecting the silkworms' metamorphosis usually calls for professionally trained skills and laboratory conditions. For ordinary people, a farmer or an artist like Liang, it would be difficult to precisely control the dose of JHs or the ecdysteroids for unconventional purposes.

Hormones have been intentionally experimented with by Liang to stimulate silkworms to secret silk filaments of dramatically abnormal shaped traces on two-dimensional platforms, which would be aesthetically innovative or attractive. Liang Shaoji's unique findings on silkworm hormones as an artist lie in his observation of the wilder and greater head swing amplitude of silk-secreting larvae reflected in the visual forms of silk traces they have spun. Such unusual phenomena were generated by two hormones with opposite principles of action, the ecdysteroids and the JHs. The artist's observations and (unsuccessful) experiments on how hormones affect silkworms and silk filaments have not been presented in artworks to the public. This 'backstage' episode, however, clearly demonstrates the intertwining relationship between making art and cultivating silkworms in his implementation of the flat cocoon technique, a dominant characteristic I have described as 'making-in-cultivating' in the previous chapter. Using hormones to interfere with the natural and spontaneous (*'ziran'*) biorhythms of silkworms is both a common technique in modern silkworm farming and an unexpected pathway for seeking artistic innovation.

In Liang's trials with silkworm hormones, the physical form of silk filaments was designed to undergo double 'rites of passage', namely from the traditional ellipsoidal cocoon to the levelled silk pieces and from the ordinary '8'-shaped flat cocoon to the abnormal round shape. At the same time, silkworms went through double-risk physiological challenges in the disorientation of secreting silk on a flat surface on the one hand and the pressure from hormonal intervention on the other. However, Liang's tactics are not more domineering compared to those of silkworm farmers. He placed silkworms on flat planes as silk quilt producers did and applied hormones as most silkworm feeders also practice. It was only serendipitous events that triggered Liang's exploration into the relationship between hormones and the shape of silk traces by blending these two means. Comparatively, Liang's determination and assertiveness in using the flat cocoon technique for artistic purposes is more prominent in his continuous experiments on materials as discussed below.

Experiments on Materials

As noted in Chapter 1, Liang's silkworm art projects began in 1989 when he endeavoured to learn how to invite silkworms to spin silk on metal materials as his initial artistic vision, since for him metal represents 'the force of industry and rationality' (Liang 1994) as a strong contrast to soft organic material silk. In both historical and contemporary silkworm cultivation, farmers have been using lattice frames mostly made of paper, plastic, wooden or bamboo strips for silkworm larvae to crawl and spin cocoons. Bales of straws were also commonly employed in some areas in China in the past. When the task for silkworms shifted from spinning ellipsoidal cocoons to secreting silk on flat surfaces, would they manage to accommodate alien materials such as metal, glass and even the skin of human beings? This question drove Liang to explore the habitual and physiological characteristics of domestic silkworms.

In 1989, copper was the first material to be tested in Liang's experiments with the flat cocoon technique, as the artist preferred time-stamped materials such as rotten iron and rusty copper to stainless steel. However, when Liang cautiously placed a bunch of fifth-instar silkworm larvae onto some copper wires, they all moved away in a slow but determined way. Liang then sought advice from silkworm biologists in Zhejiang Agricultural University. Liang recalled his conversation with experts at that institution:

> *'I went to their labs and silkworm biologists there were very curious about my artistic project; but they had no ready answers whether silkworms have an innate preference for leaves, bamboo, wood and other natural things and dislike metallic materials. Experimenting with various surfaces for silkworm's spinning flat cocoons seemed far beyond the scope of scientific research and therefore those experts can offer little help. Sericultural study then was a production-driven discipline and merely aimed for a higher yield of cocoons, or a neat timing of silkworm's growth for convenient harvest and better quality of silk yarn. Biologists are concerned with uniformity, but I care more about the differences in materials and forms.'*

It could be imagined that a scientist working at an academic institution would hardly get a funding application approved for a proposed experiment that might fail to justify any prospective contribution to the silk industry, such as one examining whether silkworms prefer or not spinning flat cocoons on metals or glass. Silkworm biology does not cover Liang's artistic inquiry which shows little 'utility' in terms of improving efficiency or productivity in silkworm husbandry. Liang therefore decided to reside in a village near Linhai, Zhejiang and conducted his own experiment on silkworm's behavioural features by raising those creatures with local farmers. He made constant adjustments in order to lure silkworms into staying on the copper mesh for a longer period of time. Liang described to me where the difficulties lay in his approach to tackling the relationship between silkworms and surface materials: 'You should not grab the worms forcefully otherwise they won't secrete silk. Just let them move naturally as they wish. All I have to do is to create certain conditions for them to crawl.' To counter the resistance of silkworms to uncanny materials, Liang nevertheless still resorted to bioscience during the processes of his creative practice (see also in Chapter 1). One of Liang's strategies was to improve silkworms' stamina. In the lab of Linhai Silkworm Breeding Station, biologists assisted Liang to hybridize different silkworm varieties and Liang eventually selected a few promising 'candidate' breeds with stronger physical strength and higher immunity to continue his artistic experiment.

It took more than three years for Liang to observe an encouraging phenomenon: If the density of silkworms on a plane such as a piece of copper mesh was high enough, they would stay there longer and eventually spin some silk threads. This strategy sounds easy to implement. I, therefore, wondered whether it can be inferred that if one puts an extremely large number of silkworms on any flat surface, they will secrete flat silk flakes on it regardless of their tastes for the material. Liang explained that if the population were too dense, silkworms would feel uncomfortable. As the artist observed, should there be too many silkworms, there would not be sufficient room for each one to wave its head in a trajectory of '8' to secrete silk. Moreover, being squeezed by other silkworms in the crowd would also lead to breakage of their skin and thus higher susceptibility to pathogens.

Similar experiments were also conducted on human skin. Liang suspected that the smell of human hair and sweat is too pungent for silkworms when he did a 'pilot study' on his own body. Like the trial on copper mesh, Liang found out that if the density of silkworms on a plane is high enough, the odour of fellow worms, which is attractive for according to Liang's hypothesis, becomes stronger than the smell of the surface and thus a large group of silkworms would stay in a place unpleasant in smell for a longer time. Meanwhile, when it usually takes four to five days for silkworms to finish building their cocoons, Liang noticed that the worms are extremely effervescent and active on the first spinning day. As time slips by, silkworms become slower and less active, and the span of silkworms' body movements and head swing was much shorter in later silk-secreting days. These behavioural traits are both noticeable on metal and human skin. He explained how it felt when silkworms spun silk on his arm:

> '*Silkworms have a little lower body temperature than our humans and it feels cool when they lie on my arm. Too many silkworms spinning silk on your skin, however, can be painful, pa-pa-pa-pa, just like a lot of tiny needles sticking in your body. Silkworms might be in pain too; they hate the sweaty odour of your skin. Sweat protects human skin but smells monstrous for silkworms.*'

Since 1993, Liang has managed to make silk-wrapped installations where silkworms spin 'flat cocoons' to cover charred copper wires taken from burned out engines ('Beds'), pyramid-shaped iron barbed wire ('Time and Permanence') and more challenging materials such as human skin and mirrors in performances such as 'Cloud Mirror' and 'Self-roped'. In Liang's observation of silkworms' behavioural patterns, silkworms prefer wood, plastic and bamboo more than copper, iron and glass. However, it is still unclear why such preferences exist. In Liang Shaoji's hypothesis, it is the silkworm's keen sense of smell as an insect that explains their different modes of action on a variety of materials as spinning workstations. Metal, human skin and glass, for instance, must emit some odours imperceptible to humans but unpleasant for silkworms, while they are fonder of the aromas of leaves, bamboo, straw and paper, which in Liang's words are more '*ziran*' and less artificial than man-made materials. Silkworms, therefore, have a affinity for natural materials.

Liang's assumption of silkworms' 'natural proximity to nature' is contested, which I will return to later, but this theory of olfactory sensation has strong explanatory power over the phenomenon of density. As Liang noted, when the number of silkworms within a certain area is so large that the smell of the silkworms' bodies overshadows the smell of the surface material itself, they can tolerate the annoying environment more than as a tiny flock. As for the silkworm's olfactory fondness, existing biological findings in silkworm fodder studies explore their smelling apparatus to improve more sensually attractive artificial food. Nonetheless, glass and metals are far beyond the category of edible raw materials for silkworm fodder formulas and therefore beyond the scientific scope of scrutiny. When visiting Guangxi Sericulture Research Centre in 2019, I asked about the correlation between silkworm and the material of silk-spinning surfaces, and there I unexpectedly heard another suspicion about the silkworm's repellence to metals. The biologist, Zhang, also observed with Liang that silkworms like wooden boards and dislike metallic materials, but his explanation focused on silkworm's tactile rather than olfactory sense:

> *'My colleague once conducted a comparative experiment between the glass and plastic plates in which silkworms seemed to lean towards the plastic. Their inclination might be ascribed to the material's friction. Silkworms have many pairs of crochets or hooked toes on their feet, and freshly spun silk fibres are coated with gum-like sericin to help them to crawl forwards. If the surface is particularly slippery, silkworms have to toil on with extra effort and suffer from a sense of insecurity. The silkworms would feel awkward when they were unable to move at will.'*

Zhang's 'theory' was narrated in an anthropomorphic tone and therefore might be persuasive but this 'tactile' interpretation of silkworms' liking of certain materials, however, seemed slightly unhelpful when it comes to the population's density phenomenon that Liang observed. Whether tactile or olfactory, both Zhang and Liang's attempts to understand silkworm's behaviour patterns pay close attention to their sensory experience with considerable imagination and empathy. Those two approaches

might not be mutually exclusive. They could be compatible to illuminate the 'presumed' sufferings of the worms on metal surfaces where silkworms would be enduring the eerie stink and simultaneously the strenuous crawl when being placed on an iron or copper board to spin flat cocoons.

In Liang Shaoji's rough classification, wood, bamboo and stone are '*ziran*' (natural) as they are associated with plants and earth, while 'unnatural' copper, iron and glass are intensively used in manufacturing industry. This division correlates strongly with the likes and dislikes of silkworms. The Chinese term '*ziran*', however, is a nuanced and ambiguous category in terms of describing materials. Some metal and glass materials, for example, appear abundantly in soil and minerals, neither synthetic nor artificial, and therefore might also be nominated as 'natural' just like the stone. There are also counterexamples in Liang's artistic experiments where human skin, for instance, is organic but not favoured by silkworms, whereas man-made plastic tools function well in both silkworm husbandry and Liang's works. The naturalness of materials as the workstation for implementing the flat cocoon technique is therefore an untenable pseudo-proposition in a practical sense. However, it is arguable '*ziran*' as an unstable classification criterion for surface materials may yet still be significant on a symbolic level, a point I will return to in the next chapter in relation to specific artworks. Liang, himself, reckons that his silkworm art series is executing the principle '*Tian-ren-he-yi*' in Chinese Daoist philosophy, 'the integrity or oneness of human and heaven/nature'. Therefore, he had not been disappointed by the numerous 'failures' during his experiments on silkworms and various materials before he could finally realize some projects as designed:

> '*I just intended to make art happen. I wondered whether the idea of putting silkworms on glass or metal would go against the Daoist philosophy of harmonious symbiosis. If so, I won't deem it to be a failure, but another artistic outcome, an alternative answer to my question on Tian-ren-he-yi.*'

In this careful examination of technical details of inviting silkworms to spin silk on flat surfaces of various materials, their uncomfortable bodily experience has been

foregrounded in this section, which is thoroughly neglected in critics' ethical evaluation of Liang Shaoji's artistic approach. As noted in the previous chapter, Liang's artistic practice encompasses the cultivation of silkworms and making art and therefore it will be helpful to juxtapose his deeds with silkworm cultivation for pure profiting purposes. The explicit discussions of Liang's techniques above provide more accurate and comprehensive analytical materials for further pondering on the ethics, or at least Daoist spirituality in his art practice.

Rethinking Naturalness and Techniques:

In regard to the naturalness in the processes of flat silk generation in Liang's artworks, Yang (2018: 125-126) comments that the artist's use of silkworms is an interaction in accordance with the principles of '*ziran*', reflecting the Daoist understanding of the relationship between humankind and nature. Daoism, as Yang argues, opposes forceful actions that go against the ways things naturally go and dissolves the hierarchical distinctions among species which has fostered Liang's compassion, appreciation and respect for the silkworm (ibid.). However, as demonstrated in this chapter, Liang's artistic practice is far from the Eastern idyllic and non-interventionist way of dealing with insects as Yang contends.

Intensive silkworm cultivation for silk production as an industry in China can be intrinsically manipulative especially in contemporary society with farmers' more mature experience in conducting hormone treatment. The majority of silkworms that spin ellipsoidal cocoons are killed in the pupal stage within the cocoons in silk reeling factories while being processed in drying or hot water reeling machines. In small-scale farms where the silkworms spin flat cocoons for silk quilt production, they are allowed to pupate and moth instead of being boiled to obtain silk, but their health is compromised without the protection of cocoons and thus they are more likely to die straight after secreting flat silk than to complete their metamorphosis. Farmers, moreover, have used the application of hormones and the flat cocoon technique long before Liang's experiments. These methods to harness the biological instincts of silkworms as domestic species who are highly dependent on human care for their survival and reproduction. The artist's innovation in practice lies in the introduction of

many uncommon materials into the application of the flat cocoon technique. Such uncanny materials such as rusty copper wire mesh, mirrors and human skin are likely to aggravate the existing discomfort of silkworms secreting silk on flat planes, either because of materials are too slippery or too pungent for the worms.

The social relationship between humans and the domestic silkworm, with silk as the mediator, has been carried out using a human-centric exploitative and manipulative approach for thousands of years. When the survival of this vulnerable insect has a one-directional dependency on humans' care, the inequality in silkworm-human power relation is magnified. Regarding the Daoist principle of 'following the way it intrinsically goes', silkworm husbandry as an industry can be seen as full of artificiality and unnaturalness. On the other hand, the flat cocoon technique, either implemented by farmers or Liang Shaoji, is making use of the biological traits of the silkworm rather than working against the natural laws, where silkworms were forced (by both their human cultivators and their own natural instincts) to secrete silk even on unusual flat surfaces otherwise they will die of poisoning due to excess amino acids in the body.

In this sense, Liang's making-in-cultivating art practice sits at the liminal stage of being and not being '*ziran*' regarding the multivocality of this term. The techniques employed by Liang are less cruel compared to boiling silkworm pupae within the cocoons in silk reeling factories but cause more possible uneasiness to silkworms placed on unfamiliar materials. Liang's experiments on materiality and the flat cocoon technique to realise his own artistic vision is surely manipulative but not necessarily 'unnatural'. He had set up more difficult conditions for the silkworms to endure and adapt for their own growth and for the generation of silk. When the concept of '*ziran*' implies integrity as a whole and harmony, the Daoist inaction ('*wuwei*') shouldn't be a refusal of contact or mutual isolation.

Liang defended his artistic experiments during my interview in his studio: 'I want to open up the neglected potential of the silkworm and see whether a kind of harmony can be achieved.' Though the silkworms' behaviours significantly demonstrated their simultaneous aversion to certain materials, Liang was determined to create encounters

between them rather than retreating to conservative preservationism. Those generated encounters are not necessarily romantic or pleasant but are likely accompanied by hurt, anxiety and insecurity. The key verb '*hé*' (unity, harmony, togetherness) in '*Tian-ren-he-yi*' emphasizes the process to meet, join, confront and unite, as myriad things have already been separated in various ways in the Daoist cosmology. However, how to get along with nonhumans in generative situations requires wit and courage.

Liang's art-making and silkworm-cultivating processes hence show the complexity and self-contradiction of the concept '*ziran*' when contextualised in specific silk-generating scenarios. Liang's 'Making-in-cultivating' techniques involves various forms of manipulation, intervention and control rooted in intense cultivating labour and bioengineering, which are not always consistent with Daoist advocacy of inaction, naturalness and spontaneity in face of nonhumans. In Liang's artworks, flat silk flakes are thus semi-natural semi-artificial material, rather than signifying pure, primaeval and intact nature uninfluenced by progressivism and industrialization. The complicated growing processes of flat silk flakes in unnatural situations for those silkworms as depicted above thus open up the interpretive potentials of silk in Liang's artworks, which should not be simply designated as a semiotic-material sign of the natural and organic, as will be discussed in the next chapter.

Chapter 3: The Agency of the Silk and Silkworms

Silk and silkworms together determine the form and format of the flat silk flakes in the restrictive and often challenging conditions set by the artist Liang Shaoji. The way flat cocoons are generated or grown on objects of various materials in Liang's artworks then dictates the functional and symbolic significance of silk in his art, a key issue this chapter will concentrate on. By alluding to prehistorical rites involving silk fabrics in ancient China, Liang's art installations and performances containing flat cocoons are to be scrutinized as processual ritual art under Gell's (1998) art nexus framework and the agency of silk and silkworm will be unpacked in situational scenes of each art project.

Silk in Chinese Culture

Silkworm and silk-related studies range from science to social sciences and humanities in and outside China. Scientists have endeavoured to understand the biological traits and potentials of the silkworm, the mulberry tree and the silk (e.g. Hiruma and Kaneko 2013; Wang et al 2016). In humanities, topics such as the gender division of labour in ancient silkworm raising practice (Chen 2013), the relationship between the legend of Silkworm Gods and Buddhism (Young 2013, 2017), and the iconology of sericultural handbooks (Hammers 2011) have drawn interest across disciplines. Silk road studies, moreover, form a distinct body of scholarship in the socio-economic and cultural histories around silk production and circulation in a global trade network (e.g. Hansen 2017; Rong 2003; Tang 1985; Wang 2015; Yin 2007). Studies on contemporary sericultural practices in regions and countries outside China are also flourishing, showing the diverse social functions and meanings of silk-silkworm assemblage in different socio-cultural contexts. Onaga (2013), for example, focuses on the tension among race, gender and bioscience in Japanese silkworm sciences, while Vallard (2013) investigates wild silkworm species in textile industries in Thailand and Laos. Douny's anthropological study zooms in on wild silk indigo textiles in relation to indigenous cosmologies across West Africa (2017).

As for silk and silkworm in China, Zhao's encyclopaedic book 'A Comprehensive History of Silk' (2005) provides a meticulous chronicle of the technological evolution of silkworm raising and silk processing methods and changes of artistic styles and artisan skills in silk fabrics throughout the dynasties. The book records revisions and updates of ancient Chinese knowledge on caring for silkworms and mulberry trees in an instrumental and pedagogical tone. Bray (1997) narrows her historical study of technology and gender to the late Ming dynasty from 1000 to 1800 and examines the gender division of labour in silkworm husbandry and commercialised silk-reeling factories from a feminist perspective. Stockard also focuses on gender issues around labour and technology in silk reeling factories after conducting comparative fieldwork in both Shunde County in China's Canton Delta and Mansfield, Connecticut in the US in the late nineteenth century (1989; 2002). She notices that daughters in Shunde with valued reeling skills were allowed to stay in their natal family to continue doing silk-reeling work as resistance to marriage (1989), while the burgeoning silk fabric industry in North America imported plenty of reeled raw silk from southern China as a part of the global silk trade (2002). In those studies, however, silk and silkworm serve rather as the anchoring point to address interpersonal, economic, cultural and political themes within the realm of human societies.

In more art-related fields such as literature, the silkworm as a familiar domesticated animal dear to the hearts of the Chinese is present in both oral and written literature from ancient times to today, which reflects the affective connection between Chinese people and this creature. One version of the origin story of sericulture starts with a wild silkworm on a tree which spun a cocoon that happened to fall down into a cup of hot tea. Lei-zu, the main consort of the Yellow Emperor, was sitting under it with her cup. She then noticed the silk filament in the water whose outermost layer of silk glue was dissolved by the heated water. Lei-zu later became known as the Goddess of Silk for her pioneering utilization of silkworm cocoons (Yuan 1985: 423). In ancient Chinese poetry, silkworms have been likened to and praised as hardworking, generous and selfless labourers in Tang Dynasty poet Bai Juyi's 'Untitled' which goes like 'spring silkworms secrete silk until death' (*春蚕到死丝方尽*). The poet Zhang Yu in the Northern Song Dynasty attacked the disparity between social classes and urban and rural areas by a

famous line in his 'Silkworm Lady': 'those dressing in all delicate silk are not the ones who toil to raise silkworms' (*遍身罗绮者/不是养蚕人*). Meanwhile, realistic novelist Mao Dun situated his political novella 'Spring Silkworms' (1932) in the turbulent social milieu of the early twentieth century, outlining silkworm farmers' daily labours in Zhejiang Province. More recently, the silkworm cocoon also appears with its rich semiotic-material embeddedness in Gu Shi's sci-fi 'Poems and Distant Lands' (2020) and Wu Ming-yi's ecological novel 'The Man with the Compound Eyes' (2013). Meanwhile, in the contemporary art world, the flat cocoon technique has been implemented by renowned Chinese artist Xu Bing in his installations 'American Silkworm Series' since 1994, where the silk flakes upon books and other printed matters have been interpreted as the materialised 'natural language' in symbolic contrast with artificial culturally-embedded human language (Vinograd 2011: 110). Vinograd's interpretation of the symbolic meaning of silk in Xu Bing's works is based on the theme being continuously tackled in Xu's various projects, namely the criticism and deconstruction of human language as an instrument of political control and interference (ibid.: 111).

As for silk and silkworm in Liang Shaoji's artworks, Liang acknowledges that the Chinese material culture of silk has nourished his artwork, although he explicitly emphasizes his stance of keeping a distance from the current mainstream ideology-infused Silk Road discourse appropriated by the Chinese Communist Party for diplomatic and cultural propaganda in present days (in Gladston 2011). Liang has clearly stated the inspiration for his installation work 'Planar Tunnel' (2011–2012) (fig. 19) is the plaint gauzy silk gown unearthed from Han Tomb No.1 at Mawangdui of Changsha City dating back to the Western Han Dynasty (206 BC – 25 AD) (fig. 20). This well-preserved silk clothing, now stored in Hunan Museum, is one of the earliest and thinnest dresses in the world and only weighs 49 grams with its fabric area of about just 2.6 square meters. Planar Tunnel (2011–2012) is often displayed on the white wall in many gallery spaces, where the extremely thin and light flat silk pieces can reflect jade-like or metallic sheen under different light sources as the shadows on the wall overlap with the silk plane to duplicate their delicate textures. If a viewer walks close enough, even the breath can blow the silk planes into a tremble. It is obvious that the silk gown from Mawangdui

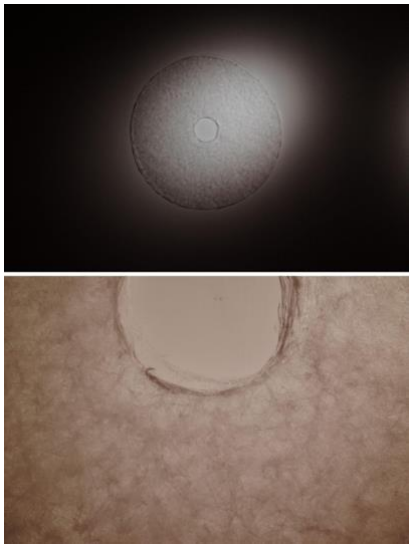

Figure 20: 'Planar Tunnel', 2011–2012 (Photo: XU Feixuan, 2018)

Figure 20: Silk gown Unearthed from Han Tomb No.1 at Mawangdui, 206 BC – 25 AD (Photo: Hunan Museum)

inspired 'Planar Tunnel' in its form and aesthetics, both presenting the lightness, thinness and translucency of silk fibres.

'Planar Tunnel' is the only piece among Liang's oeuvre in which silk floss generated by the flat cocoon technique stands alone as an artwork without having contact with any other objects and materials. If viewed as a minimalist painting, its canvas is the painting itself, being extremely abstract and therefore highly versatile for symbolic interpretation. Art critic Xia (2015), for example, relates the circular shape of the silk pieces to the classic form of jade pendants in ancient China and thus claims that this work shows the ancients' cosmology encapsulated in the phrase 'heaven round and earth square'. Moreover, the realization of this installation is said to turn the 'natural thing', namely the silk spun by silkworms, into a work of art while retaining its 'naturalness' as a manifestation of Eastern aesthetic of ethereality and ambiguity (ibid.). However, if taking into consideration the complex interplay between cultivating silkworms and implementing the flat cocoon technique in the artist's creative practices, as depicted in Chapter 2, the flat silk flakes in 'Planar Tunnel' cannot be equated with a pure and uncontaminated 'nature' that is transformed or converted by an artist to become an artwork. Rather, I argue that this work as a sheer presentation of Liang's mastery of the flat cocoon technique, itself demonstrates intrinsic paradoxes of '*ziran*' in regard to the 'natural' form of silk and the 'natural' behaviour of the silkworm (see also Chapter 2). During the processes of generating 'end products' as the final exhibited silk objects, the

artist determined their size, shape and thickness while the silkworms spun silk filaments to realise Liang's vision through the texture and lustre of each silk flake. Such a collaborative procedure is much closer to a ritual of 'growing' in order to creatively generate and explore the concept of '*ziran*' materially and symbolically, rather than a transitional process to turn a given thing with embedded 'naturalness' into an art object like going through a 'rite of passage'.

In Liang's other numerous works infused with flat silk, the silk floss directly spun by silkworms no longer appeared alone but met and integrated with objects of various materials. It will be useful to examine archaeological findings on silk and silkworm cultivation in ancient China as to how to understand this compositional structure of 'wrapped in silk' permeating most of Liang's projects. Ancient Chinese ritual beliefs divide the universe into three layers of space, namely the deity heaven, the human earth and the nether world (Gao 1994 in Fung 2013: 221) while silk was not ordinary fabric but one that can facilitate communication between the deity heaven and human world, as evidenced in both archaeological evidence and written historical records. One of the earliest dated archaeological discoveries of silk fabrics found in China are silk fragments in urn burials at the site of the Yangshao culture in Qingtai Village, Henan Province around 5,000 years ago. In Yangshao culture by the Yellow River basin, about half of the entombments were in urn/jar burials, where the bodies of children were wrapped in silk and then placed in clay jars as coffins to be buried near their houses (Fan 2020: 19). Clay containers were used for dead children because the ancients believed the close contact of the burial pot made of soil could grant the deceased the blessings from the goddess of the land. Moreover, the pottery was also a symbolic and material resemblance of the womb of a mother for the dead's rebirth, as speculated based on sympathetic magic and transmission theories (Lu 2001; Poo 1998). Meanwhile, the urns were usually left with a small hole whose function is to allow the soul of the deceased to ascend freely to heaven resembling metamorphosed silkworm moths flying out of the cocoon (Zhang and Gao 1999: 3; Zhao 2012: 15). In Zhao's (2012: 19) view, it was also because the silk covers the deceased like the cocoon protects the silkworm pupa that 'wrapped in silk' thus acquired its function of rebirth and transcendence in ancient Chinese obsequies. This ritual pattern also appeared in the Yin Shang period where bronze vessels as '*liqi*' were buried

wrapped in silk. '*Liqi*' refers to shamanic objects to communicate respectfully to the supernatural in funeral ceremonies including vessels, paintings, jewellery and other artifacts carrying cultural symbols in their shape, colour and decoration (Fung 2013: 221). Silk was not a supplement to pottery jars and bronze vessels as '*liqi*' in rituals, but silk fabric itself can serve as a medium to 'bid farewell to the dead' (*songsi*) and 'communicate with the gods' (*shi guishen*), as recorded in '*Liji*' (Book of Rites), a collection of ritual rules written during the 5th century BC to the former Han periods. Zhang Hua (232-300) in his short story collection '*Bowuzhi*' (Vast Records about Different Topics) made association between the two homophones '*yong*', namely silkworm pupa (蛹) and tomb figure (俑) to justify the ritual significance of silk as a mediating material. It was after the Warring States period (5th cent. -221 BCE) that silk became a dress material for ordinary people from its previous application in ritualistic scenarios for the deceased and this exquisite material then has functioned as an important component of Chinese material culture (Zhao 2005).

'Wrapped in Silk' as a Ritual Pattern

I allude specifically to the inferential agency of silk as shamanic mediator in funerary ceremonies in ancient China in order to make a comparison between this prehistoric ritual practice and Liang Shaoji's silkworm artworks in the contemporary time. As a complete metamorphic creature, the domestic silkworm undergoes drastic morphological transformation in its weeks-long lifespan. Silkworm's changes in body forms and its capacity to secrete cocoons give both them and the silk a rich functional potential, both materially and symbolically in funeral events. In primeval rites related to death the silk fabric employed were reeled and woven from ellipsoidal cocoons, while in Liang's studio, silkworms directly secreted flat silk on the pre-settled range of objects. Regarding the making procedures of Liang's installation works as a ritual process, the silk entered the interplay of artistic rites at the very beginning rather than waiting until it was degummed and woven into fabric. When the artist acted as the mediator between silkworms and other materials, silkworms were placed to crawl on various objects and spin flat cocoons to cover them. It was the silkworms rather than the human artist who executed the act of covering, wrapping and shielding like shamans.

Figure 21: 'Destiny', 2012-2014 (Photo: XU Feixuan, 2019)

In calamity-themed installations such as 'Helmets' (2004), 'Wenchuan Stones' (2014-2016) and 'Destiny' (2012-2014) (fig. 21), silkworms had close physical contact with helmets and headlights of deceased miner, as well as the rubble from the ruins of the earthquake and iron plates resembling the wreckage of sunken ships in the Gulf War, crawling on and cocooning over those objects. The antique ritual structure 'wrapped in silk' thus has been revived in Liang's silkworm art while Liang's implementation of the flat cocoon technique involved the silkworm as the 'prototype' (Gell 1998) of silk to become an active initiator of the healing and soul-releasing rituals. The visual

presentation of 'wrapped in flat silk' where the contours of objects are 'smothered over by the silk floss', however, has been read by von Drathen (2011) as softening and receding the dread in order to obstruct attempts to preserve memories of horror, which can be a potential covering-up by the government. This, however, is a misinterpretation if considering the efficacy of silk in communicating with the supernatural and ferrying the souls of the dead to the otherworld in ancient Chinese ritual beliefs. On the other hand, Zulueta rightly points to the significance of the wrapping process before installations were exhibited in gallery space which '[extend] the protective cushion of life to enfold new forms of vulnerability' to mourn the death (2016: 384), though he does not elaborate on the wrapping process itself and neglects the ritual function of silk contextualised in Chinese culture.

The healing and repairing ritual in 'Snow Cover' (2013-2014) is less explicitly expressed compared to those directly dealing with disasters and death, even though Liang has pointed out on a symbolic level that the intention of this work is 'to heal and salvage', as mentioned in the introduction of this thesis. The ordering in this artwork, namely the discarded everyday objects scattered on the table, conveys a very clear iconographic connotation to the audience, representing ordinary fragmented life in contemporary industrialized societies (Xia 2017: 61). However, the ritual process to regulate the social dysfunction brought about by modernity is yet under-analysed. The agency of silk in this work is manifested in its capacity not only to cover and heal humans' wounds from dysfunctional social relations, but also to animate and recover the abandoned non-organic objects whose social lives in human society have ended. 'Snow Cover' therefore should not be understood as an ironic presentation contrasting the illness of contemporary social life with the comforting power of vibrant wild nature as the silk denotes as Xia contends (2015; 2017). Rather, this artwork initiates a ritual to reconcile complex social networks among humans, things and nonhuman organisms in the contemporary world, via the intimate entanglement between man-made things, spinning silkworms and the generated silk in the contact zone of silkworms and those objects.

On the other hand, the often-ignored temporality in Liang's ritual art with the implementation of the flat cocoon technique has been foregrounded in the ritual of ever-growing 'Time and Permanence' from 1992 to today, where batches of silkworms secreted silk to wrap not only the pyramid-shaped barbed iron wires but also the slightly duller silk floss spun by their silkworm peers in the past years. The newly spun silk threads forming the outer layers are relatively white and shimmering while the inner fibres gradually lose their gloss over time. This notable gradation of visual characteristics of silk floss on the same barbed iron pyramid shows the growth, or material accumulation of this artwork over nearly twenty years and also commemorates the death of countless short-lived silkworms who had spent their whole spinning days on these objects. The conspicuously contrast in the temporal scale between the lifespans of silk and silkworm is exposed in 'Time and Permanence' as well as other Liang's installations using flat silk flakes. The short lifespan of numerous silkworms is thus superimposed on the temporality of Liang's processual ritual art, a key point to understanding his works that is often obscured by presenting the silk-bounded installations as 'end products' in exhibition settings.

Silkworms as Agentive Performers

Exceptionally, the agency of silkworms become prominent in Liang's two performative artworks, namely 'Self-roped' (2000) and 'Cloud Mirror' (2007), in both of which silkworms were still required to spin flat silk floss over materials unpleasant to them. However, silkworms no longer only served as the prototype of the flat silk floss in Gell's art nexus but entered into the processes of Liang's ritual art as important performers. 'Cloud Mirror' (2007) is a performative project (fig. 22) where the human agent Liang, the agentive prototype silkworms and the silk floss all participated in this meditation ritual. The performance was situated on the summit of Tiantai Mountain where Guoqing Temple, the ancestral palace of Tiantai school in Buddhism is located (fig. 23). The artist sat cross-legged on a stone with a piece of glass mirror on his knee. Stronger crossbred silkworms could be seen crawling and spinning on the mirror, whose surface was then gradually covered by silk threads with the reflection of flowing clouds up in the sky. The artist kept still and meditated, while the tiny creatures on the mirror strived

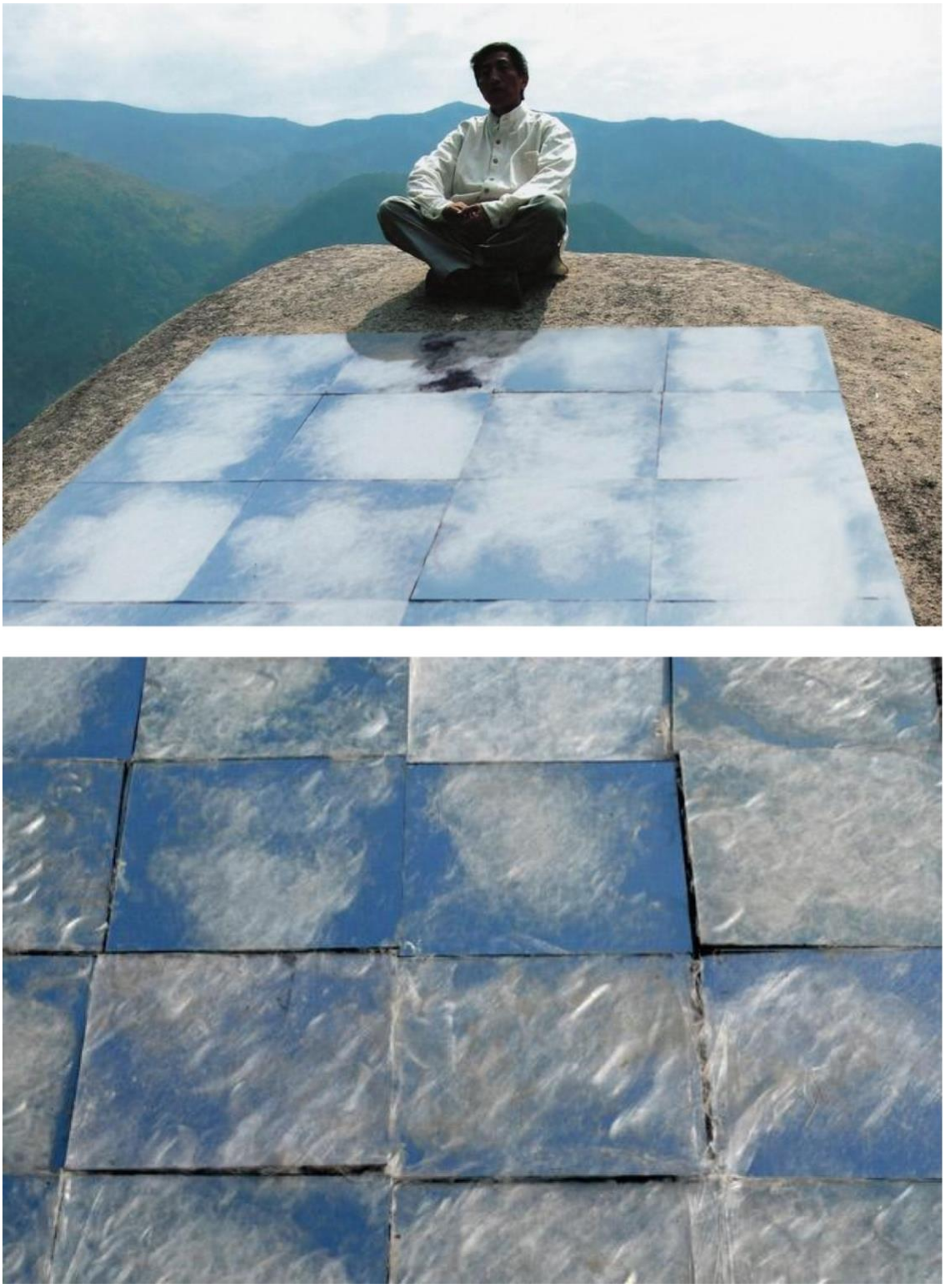

Figure 22: 'Cloud Mirror / Nature Series No. 101', 2007 (Photo: ShanghART Gallery)

to move forward and secreted silk at a slow pace. The material assemblage of silk and mirror, the surrounding mountain peaks, sky, cloud, daylight and the underlying local Buddhist and Daoist culture and history of Tiantai were all compressed into this ritual

Figure 23: Guoqing Temple at Tiantai Mountain (Photo: XU Feixuan,18 2019)

event. The scene was visually idyllic and ethereal for both the artist and the audience of the video recording of this performance to contemplate.

Under the spotlight of 'Cloud Mirror' is the artist's on-site physical and psychological experience, a human being's immersion and spiritual meditation within a spontaneous spatio-temporal realm. However, the dark side of this artwork's celestial, harmonious and intelligent presentation of '*ziran*' is the physical and psychological experience of the silent non-human participants. Dwelling and spinning on the mirror must have already drained the silkworms completely because spinning flat silk on slippery glass surfaces would bring double discomfort to the worms, as explained in Chapter 2. Their likely sense of fatigue, anxiety and insecurity dramatically contradicts the calm, speculative and serene state of the artist Liang in the same meditation ritual. Measured from an anthropocentric perspective, this ritual successfully conveys the spirituality of '*ziran*', or nature, despite the term's ambiguity, as the performance intentionally combined elements namely the mountain, clouds, sky, animal and cloud-like silk floss conventionally designated as being 'natural'. Nonetheless, if taking the silkworm's physical experience in this meditative ritual into consideration, the efficacy of this performance is rather undermined by the contradictory 'unnatural' state of the worms.

The uncomfortable experience of the silkworms is amplified and complicated in another performative work of Liang Shaoji. 'Self-roped' was performed indoors at the 5th Biennale d'Art Contemporain de Lyon in 2000, as part of the group exhibition entitled '*Partage d'Exotismes*' (Sharing of Exoticisms). Lyon used to be renowned for its well-developed silk industry (Hafter 2020: 33). Liang started to raise silkworms in the city before the opening of the biennale and invited two female students from a local dance school in Lyon to participate in this project. During the exhibition, these two women sat and lay at a corner of the gallery, naked and almost motionless, while hundreds of silkworms were crawling on their bodies constantly spinning silk threads to wrap them up throughout the daytime. Gradually, the dancers were encased by the silkworms using their self-spun silk 'ropes' (fig. 24). The allusion of the work's Chinese name 'Self-roped', or '*zifu*' (*自缚*), is a shortened version of a common idiom known as 'make cocoons to tie up yourself' (*作茧自缚*). The literal meaning of this idiom would be neutrally descriptive, denoting the pupation phase when a silkworm larva makes a cocoon to wrap itself until metamorphosing into a mature moth. Being covered up by cocoons, silkworm pupae are restricted to a very tiny room for movement while they are also protected from pathogens and natural enemies outside their ellipsoid-shaped shelter. Nevertheless, when the phrase 'make cocoons to tie up yourself' is applied metaphorically in Chinese, the restrictive aspect of a cocoon's function has been emphasised and thus the idiom usually indicates 'being trapped by self-imposed limits' or simply 'making trouble for oneself'.

The title 'Self-roped' fits ironically in this performance. When the silkworms had to spin 'flat cocoons' on human skin rather than an ellipsoid one for self-protection, the role of newly spun silk threads as a shield dissolved. Flat cocoons can no longer safeguard the worms, nor can they keep two female dancers from any harm. Two roped human beings, at the same time, were constrained by the silk threads from moving freely. It seemed to be a lose-lose situation when humans intervened in the self-roping process of the silkworms. To implement this performance, silkworms had to tolerate the pungent smell of human hair and sweat according to the artist's empathetic speculation based

Figure 24: 'Self-roped / Nature Series No. 31', 2000 (Photo: ShanghART Gallery)

on his observation of the worms' behavioural traits. The artist therefore had to increase the density of the silkworms on human skin to lure the worms to stay and secrete silk there for a longer period of time (see Chapter 2). In Lyon, Liang needed to make extra effort to facilitate this artistic ritual, as the design of the performative strategy was unfriendly to both silkworms and the two dancers. The two women not only endured

the discomfort on their skin when the silkworms crawled on them but also suffered numbness from sitting in the gallery space for hours without any dramatic movement. They were even advised to eat and drink less so that during the exhibition time they would not need to go to the toilet throughout the whole day's performance. As for the silkworms, the artist observed in the pilot study where silkworms secreted silk on his own skin that silkworms are less energetic and active in the later phase of their four- or five-days' long silk-secreting period. For this reason, Liang carefully considered the growing pace of the worms and deliberately chose larvae in their second or third spinning day to perform on-site with their human co-performers. The silkworms placed on the dancers' skin were hence more docile and cooperative. In the end, both parties in this performance, as Liang noted in my interview, were 'too weary and almost lost all their alertness'.

For viewers and reviewers of 'Self-roped', it was not evident that the realisation of this performance requires strong perseverance from both silkworms and human beings. The scene appeared to be harmonious and serene, where two species cohabited intimately within a limited space and time. The art critic Cheng (2007: 68), for example, perceived the scene as silkworms caressing and protecting the female dancers as if they were silkworm pupae to metamorphosize. However, she also criticised Liang's patriarchal treatment of female models as a male artist in which Liang implicitly makes an analogy between the status of compliant women and of domesticated silkworms as 'soft, docile, industrious and impressionable' (ibid.). Cheng's feminist critique is incisive. If the human performers of this ritual had been males instead, it might not have affected the expression and efficacy of this performance, but the reasons for Liang's choice of female dancers were unstated. However, knowing of the unspoken endurance and exhaustion behind the scenes, Cheng's description of the cross-species interaction in 'Self-roped' seems overly romanticized. This performance would not be 'successful' should any of the human or non-human performers stay very sensitive and clear-headed. It was the enduring numbness that had triumphed over their physical discomfort and then guaranteed the transient but challenging interaction in this ritual. In critical discussions of 'staying with' other species, notions of care, affect, and attention are often emphasised and expounded (cf. Haraway 2008) while the strategic endurance, exhaustion and

numbness are too easily underestimated. The case of 'Self-roped' points to another possible gateway to meeting with other animals. Mutual tolerance or even ignorance can be reached via being tough, hardy, dull and less egocentric. Living creatures involved in a difficult situation might need to employ this insensitivity towards each other in order to refrain from certain conflict or repellence. When human bodies and silkworm bodies came into direct contact in 'Self-roped', they were pushed to their physical limits and thus created a confrontational tension through the medium of silk. This ritual performance thus can be interpreted as an anti-structural (cf. Turner 1982) recognition of '*ziran*' in its initiation of an unnatural co-existence. The function of silk filaments sat somewhere between (unwanted) protection and confinement for both human and silkworm, while the bodies in soft confinements were faced with the dilemma between freedom and security. As the artist states, the initial vision of this performative art originated in 1992 (Liang 2002: 43), not long after the Tiananmen crackdown. This work might also be Liang's reflection upon the unlimited state power and individual freedom, though in a veiled way.

The Efficacy of Ritual Art

Among Liang's flat cocoon artworks, whether classified as an installation or performance, the growing and generating process enacted by three agencies, namely the silk, silkworms and the artist, determines its expressive content and ritual efficacy. As already noted, the way flat silk floss is secreted in the physical contact zone of silkworms and various materials differs drastically from that of ellipsoid and flat cocoons made in agricultural contexts. Therefore, the comprehension of silk and silkworms' agency in Liang's ritual art projects should not be limited to the stereotypes in Chinese material culture, where silk stands for rarity and preciousness and silkworms are diligent and selfless labourers. Putting Liang's works into the framework of ritual enables a shift of focus from the final presentation of those projects in galleries to the artist's 'cultivating-in-making' practice combined with the silk-silkworms' spinning processes.

To closely examine the role of silk and silkworm respectively in the art nexus, the ritual structure of 'wrapped in silk', as analysed in each case, alludes to ancient funeral rites

where silk was granted a mediating function to heal wounds, repair cracks, communicate with the supernatural and ferry the deceased to the otherworld. Such ritualistic functions of silk relate to the physical and symbolic similarities compared to the shape of ellipsoid cocoon as a shelter, the soft texture of silk, the great changes during the creature's metamorphosis, and the drastic interaction in the moment of the silkworm moth breaking out of the cocoon. Meanwhile, the flat cocoon technique employed by the artist complicates the interplay between the silk and the objects it covers. Silkworms placed in unnatural conditions to secrete flat silk flakes are likely to suffer from physical discomfort on unusual materials. They were no longer passive prototypes as silk producers behind the stage but participated actively in the meaning construction and effect enactment of each ritual. On the other hand, silkworms took the place of human shamans in ritual practice in Liang's art. The worms crawled over objects and human bodies, generating silk as the spiritual and material medium, and thus triggered the supernatural power in either the meditative or healing ritual art project when alluding to previous rituals in ancient China.

Liang's series of silkworm art, in this sense, can be scrutinized as a microcosm of an animistic world filled with ritual energies and therefore a critical examination of its processes, enactment, material entanglement and sensory experience throughout the procedure is essential for an accurate understanding of his work. This analytical framework also poses further questions to the exhibition and preservation of similar art projects with complicated temporalities and agencies involved. Regarding Liang's implementation of the flat cocoon technique as a semi-shamanic act in ritual practices, existing exhibition schema in the contemporary art world only enable the audience to see videos of performance art such as 'Cloud Mirror' or the on-site installations where spinning silkworm larvae as the main ritual practitioners have already finished their performance and have left the scene. Thereby, the audience and reviewers as the recipients in Gell's art nexus are always absent from the rites of growing, healing, meditating or contesting, and moreover, insufficiently informed about the enactment of ritual actions. Both installations and performances discussed in this chapter hence ask for innovative ways to engage the audience into the live ritual process to more effectively achieve the efficacy of Liang's ritualistic art.

Chapter 4: Anthropomorphic Kinship with Silkworms

In the majority of Liang's 'flat cocoon' artworks analysed in Chapter 3 as ritual art, the audience was often absent from the initial processes, arguably arriving too late. When the silkworms as the main performers have retired from the scene and ended their short lives, both the silk floss they have left on the stage and the objects wrapped in silk remain in material forms either as installations or video recordings of performances. These post-ritual art objects undergo the transitional rite of being curated for exhibition and begin the next stage of their life as exhibits in art spaces. Among Liang's silkworm works, however, there is one project that is an exception in terms of the timing of involving the audience. This work could be classified as 'socially-engaged art' within the contemporary framework while it is also feasible to view it as a baby-adoption ritual with live audience participation.

In 1994, Liang Shaoji first finished the material part of his artwork '*Bao-bao* (Babies) / Nature Series No.15', where the artist wrapped up a large number of cocoons in sewn red silk swaddling clothes as if wrapping up human infants. These silk-wrapped cocoons were to be spilt onto the floor in galleries or on the ground in a public space (fig. 25). Liang later created multiple versions in accordance with the social context and space these swaddled 'babies' were to be shown. Following the tragedy of the Wenchuan earthquake in 2008, for example, Liang exhibited it in a square in Shanghai during the National Day holiday in October of the same year. Liang described that impressive event when chatting with me in his studio in Tiantai:

> *'I invited the passers-by to come up and wrap the cocoons themselves. They could also adopt a silkworm baby but had to give it a name and write a blessing message on the adoption card. At the end of the day, the whole public space was plastered with cards. There were also lao-wai (foreigners) who came along and told me they were deeply moved and even donated money to these silkworm babies.'*

Figure 25: 'Bao-bao (Babies) / Nature Series No.15', 2009 (Photo: ShanghART Gallery)

The project '*Bao-bao'* was also exhibited at the 2nd Pancevo Biennial in Serbia, 2002. After the war in Kosovo, Serbia was economically strapped but eager for cross-cultural exchange and dialogue. Liang, who never rarely sells his silkworm works, gifted '*Bao-bao*' to the biennial organisers after the exhibition. Liang recalled the overall impact of the piece: 'The work resonated widely in Canada, the Netherlands, Latvia and China, of course, and even touched some viewers to tears, writing down many heartfelt thoughts and wishes on the adoption cards.'

This chapter mainly deals with the human-silkworm kinship in the project '*Bao-bao*' as a ritual of adoption with an underlying theme of anthropomorphism, which has been implicitly foreshadowed in discussions of empathetic speculation on the silkworms' body experience on different materials in previous chapters. As there exists no scientifically verified explanation of silkworms' behaviours, both the artist Liang and the scientist Zhang have to rely on anthropomorphic guesses. Here I will pick up the thread and examine the address of 'silkworm baby' in both colloquial language and the anthropomorphic logic in daily silkworm-raising practice in Chinese and then compare the art strategies in '*Bao-bao*' and 'Beds', another installation work of Liang in regard to their efficacy of cultivating trans-species care.

'Silkworm Baby' in Chinese Language

For Chinese-speaking audience, or at least those familiar with Chinese culture, the title of this artwork '*Bao-bao*' clearly suggests that it is an intended visual and material articulation of the Chinese phrase '*can bao-bao*' (蚕宝宝), literally referring to 'silkworm baby'. '*Bao*' means gems or treasure in Chinese and its reduplication '*bao-bao*' is an affectionate term to call a child or infant, with its closest English counterpart being 'baby'. '*Bao-bao*' can also be broadly applied to address a beloved one regardless of age to express the speaker's love for them as a treasure, namely one's partner, son, daughter or even a pet. The panda which is one of the most adored animals in Chinese culture, for example, is often referred to as 'panda *bao-bao*'. Another most commonly used compound of an animal and '*bao-bao*' comes from the silkworm, with its deep roots in Chinese culture.

The visual resemblance between the silkworm and the human child seems to be most evident when the larvae in their fourth and fifth instar are small, white and chubby, with a smooth and soft skin just like a human infant's fingers. It is no wonder that the silkworm biologist Zhang has jokingly referred to artificial fodder for junior silkworm larvae as the baby formula. The name '*can bao-bao*', however, does not exclusively denote the silkworm in its larval phase; rather, this creature in any metamorphic stage, as a larva, pupa or moth, can be called '*bao-bao*', just as a cherished person can be

someone's '*bao-bao'* regardless of his or her age. The silkworm has a tiny body shape, is not aggressive and appears docile because of its limited mobility indoors. Raising silkworms in one's farmhouse, therefore, perhaps shares more similarities with raising an infant than other farmed animals.

As silkworm larvae are fragile, delicate, sensitive to the environment and susceptible to various pathogens, they cannot survive independently of human care, but heavily rely on their human cultivators to meet basic needs for mulberry leaves, clean shelter, medical treatment and protection from harm. It is a situation approximate to that of a baby infant under intensive parenting. This kind of care and dependency in a relationship together with affect, responsibility and empathy has been morally valued in feminist care ethics arguing that all human beings depend upon the care of others from birth to survive and develop necessary capacities and therefore it is a moral duty for capable humans to care for others in need (e.g. Donovan 2006; Gilligan 1982; Held 2006). The silkworm baby as an anthropomorphic term therefore captures the analogical 'kinship' between humans and silkworms where both frail humans and animal 'babies' require equal attention, love and protection from capable human adults.

One afternoon in spring 2019, I sat in an outdoor ground inside the Silkworm Breeding Station of Yizhou County, helping a female worker, Ms Liu, to cut cocoons. The silkworms had already pupated in the cocoons delivered to this breeding facility, and the workers' job was to cut off a corner of each one with a sharp knife, pour out the pupae and divide them into male and female groups for convenience in subsequent mating sessions. I examined the pupae on the palm of my hand and asked Aunty Liu sitting beside: 'Why are some pupae moving while others seem still?' She answered: 'Just like human babies, some crying and some laughing.' In her casual analogy, these silkworm pupae were still lovingly regarded as children, young and sometimes inscrutable, even though they had entered into the later stages of a silkworm's entire life cycle. In the summer of the same year, when I interviewed biologist Zhang at Guangxi Sericulture Research Centre in Nanning, he recalled the scene when he was giving guest lectures on silkworms to kids at the kindergarten his son attended. 'The children in that class knew me well, and they each held several silkworm larvae in hand

to observe. One little girl came to me and asked: "Uncle Zhang, the silkworm *bao-bao* has so many feet. Does it wear shoes then?"' The biologist confessed that he was embarrassed as he couldn't think of a proper answer to these baby kids. 'This question about shoes always lingers in my mind', Zhang said.

Silkworms are warmly treasured as '*bao-bao*' by Chinese people in Mandarin, not just because the silk these creatures spin is a precious, expensive and extremely comfortable material that has been widely used in many aspects of social life. In sericultural practice in Guangxi province, the region of the world's largest cocoon yield, most farmers and their silkworms live under the same roof and share the domestic space physically together. Cohabitation creates the spatial and psychological amity between silkworms and their human caretakers, 'as if they are very important parts of our lives', as the biologist Zhang put it. Moreover, for the majority of silkworm farmers in Guangxi, silkworms are indeed significant survival comrades, as the cash from selling cocoons is the main, if not the only, source of income for many rural households in sericultural areas. The dependency in the silkworm-human relationship, in this sense, is never unidirectional. The silkworm *bao-bao* lives under the intense care of human beings, and conversely, humans depend on the silkworm for their own livelihood.

'Silkworm Baby' in Sericultural Practice

The bond between Chinese people and domestic silkworms is 'kinship-like', not merely because in China silkworms have the affective nickname baby '*can bao-bao*' resembling the treasured and vulnerable human infants as noted above. It is kinship because the relationship between humans and silkworms, just like blood relatives, cannot be unilaterally declared severed or discarded at will on species' symbiosis level. Three thousand years of mutual domestication, selection and adaptation have resulted in the interdependence where the silkworms as a group cannot survive without human care. This kinship-like affinity is not only manifested in the language, but also in human feeders' corresponding caring and cultivating strategies with extra attention and caution paid in sericultural context.

Silkworm babies have been carefully treated by farmers hosting and feeding them on a daily basis according to my observation when living and working with them in a village in Yizhou County, Guangxi. Experienced farmers all knew how to chop up the tender shoots from the tops of mulberry branches and feed them to the silkworm ants. When the larvae enter their fourth instar, matured enough to chew the leaves by themselves, the farmers will scatter whole leaves with their stalks to the worms. 'Just like babies, they should definitely eat finer food when they are small', as one villager commented. In addition to keeping the silkworms' rooms clean to prevent disease, it is best to maintain the indoor environment comfortable and well-ventilated with moderate temperature and humidity and to avoid too strong sunlight coming directly through the windows. Spring in Guangxi can be extremely wet for a few weeks and water can even bead up on the walls. The farmers once complained to me empathetically: 'It is too wet for us to stay at home and breathe just as the silkworms.' Silkworm larvae in their first and second instar are the most vulnerable and sensitive to the living conditions, and farmers, therefore, are advised to shower, wash their hands, and change the clothes they wear outdoors before feeding the worms. Some villagers were impatient with the fussiness of the junior silkworm babies, while some others showed understanding and tolerance: 'Well, we are also asked to wash the hands first before we held a new-born baby in the hospital, aren't we?' The anthropomorphic analogy between frail human infants and silkworm babies frequently worked in farmers' logic of caring for silkworms.

Such anthropomorphic logic was even more prominent in the doctoring practice of the silkworm in the agricultural context. When most villagers in Guangxi province dedicate a bedroom or half of the living room in their own farmhouses to raise domestic worms and become roommates for thse creatures throughout their larval stage, a farmer should not only act as a host and a feeder but also has to take on the responsibility as silkworms' 'family doctor'. Fragile and sensitive to its living environment, the silkworm behaves so fussily that it requires its human cohabitants to be diligent in cleaning and disinfecting the rooms and maintaining good hygiene habits. Otherwise, a wide range of pathogens, namely viruses, fungi, parasites, pesticides and even fluoride dust, can cause mass death of a whole batch of silkworms and render more than two weeks' caring endeavour of farmers futile. Disease management, therefore, has always been the keyword in both

silkworm farmers' casual exchange of experiential strategies and also the research agenda of many bio-scientists. Core operational steps in silkworm disease management include thorough disinfection of the environment of silkworms' bedrooms and all the rearing tools, fertilisation of mulberry trees to ensure nutrient-rich foliage, microclimate regulation of indoor temperature and humidity, and proper isolation of silkworm excrement containing possible pathogens in order to avoid contamination of farmland and water resources. Disease prevention measures in sericulture demand more delicate skills than many other domestic animal husbandries, such as chickens and cows, partly due to the short lifespan of silkworms. A much smaller time scale makes it more impractical and infeasible to solve the disease problems by vaccines as used for pigs and antibiotics for chicken.

One headache for silkworm farmers is the proliferation of fake silkworm medicines in the sericultural industry. Some unscrupulous traders claimed that their medicine can cure all silkworm diseases and spraying the medicine on mulberry leaves and feed the worms in advance can prevent the attack of any disease. Though such advertisements confuse preventive with curative effects in their blurred rhetoric, they cater to the cognitive inertia of some farmers to 'treat diseases'. During my months' stay at Village X, I realised that the analogous mentality of silkworm farmers in their veterinary processes traversed the species boundaries between humans and silkworms. Farmers who are willing to feed the silkworms with preventive or curative drugs should not be labelled as ignorant, scientifically illiterate laymen easily fooled by charlatans. But rather, behind their caring and doctoring practice, lie the pharmaceutical logic of treating silkworm babies as human offspring.

Local farmers were not unaware of the poor quality of veterinary medicines on the market. The setback of purchasing fake silkworm medicine, nevertheless, has not dampened many farmers' enthusiasm for feeding their silkworms with therapeutic drugs. They just gave up the animal versions and then turned to the medicines for human use. A farmer, Mrs Qin, once explained her reasoning to me:

'The quality of medicine for human use is definitely better, as they must be strictly tested before being put into the market. There won't be too many fake human drugs. It would be a big deal if a person took fake medicine and then died from it. For veterinarians, medical malpractice is not necessarily a severe accident, is it? If an animal dies, let it be. That's why there are so many fake silkworm medicines on sale.'

It was antibiotics for humans that have been selected by farmers and used on the silkworms for disease prevention or treatment purposes, including chloramphenicol, erythromycin and roxithromycin. Experienced villagers shared the observation that if the mulberry leaves are too wet, either because of early morning dew or raindrops, the silkworms would become particularly susceptible to disease when eating too many soaked leaves. One farmer further explained the dosing logic when we were chatting in his farmyard:

'We were afraid that the worms would have diarrhoea with too much water in their bodies, so we dilute one small bottle of antibiotic injection for treating human diarrhoea and spray it on silkworms' daily meals as a precaution. And human's antibiotics aren't too expensive. The price used to be two yuan per box and now is five yuan.'

In rural areas in Guangxi, taking cheap antibiotics for diarrhoea is an economic, convenient and effective survival tip for many farmers living in the countryside. When the expected lifespan is drastically reduced, from an average of decades for humans to just over forty days for silkworms, therapeutic drugs that act on human bodies become preventive drugs for silkworms. The form of 'misuse' of antibiotics has transformed from 'unnecessary dosing for unrelated symptoms' on humans towards 'dosing even without symptoms' on silkworms. The significantly reduced disease-resistance of silkworms after consuming too many wet leaves has been empathetically interpreted by a few farmers as an increasing tendency to have diarrhoea. Their analogical pharmaceutical usage of antibiotics for silkworms thus became reasonable, despite the temporal discrepancy between therapeutic and preventive effects brought about by the gap

between two species' polarised lifespans. Farmers in the same or neighbouring village often exchange their experiences in dosing the antibiotics during their casual conversations, such as whether chloramphenicol would be more useful than erythromycin, and what would be the appropriate ratio of water to the drug. Those active intra-community experiential tips, at least, demonstrates that pragmatically dosing antibiotics to silkworms as a precaution against diseases does not have noticeable negative effect on these creatures in a short span of time.

As for the effectiveness of broad-spectrum antibiotics in silkworm disease management, it would be a difficult issue to quantify and draw definitive conclusions. This is partly due to the fact that there are too many variables in silkworm rearing practice that it would be impossible to trace a single causal train in one's failure or success of a batch. Nonetheless, the logic behind using human-use antibiotics on the silkworm is certainly problematic in terms of pharmacology when pathogens of major silkworm diseases in Guangxi are viruses and fungi, which cannot be killed by antibiotics. The farmers in Yizhou fed human-use antibiotics to silkworms as they purposefully tried to avoid the risk of buying fake silkworm-use drugs in the less strictly regulated veterinary drug market. They diluted the antibiotics with water and sprayed them on freshly-picked mulberry leaves, as one farmer Mrs Qin once reasoned: 'When we give medicine to a child, we always break the tablets in half and only feed one half of it to a baby. The same goes for silkworm larvae.' Farmers very considerately reckoned with the concentration of the medication, diluting the antibiotics with water because the silkworms are delicate babies just as human infants.

As shown in these colloquial and pragmatic scenes of human-silkworm sociality, the anthropomorphic mindset embedded in 'silkworm baby' pervades in Chinese people's perception, discourses and practical codes . Contextualizing Liang Shaoji's '*Bao-bao*' in the larger background of silkworm husbandry and cultural conventions in China is to unpack the rich connotations of this simple title, namely the cross-species kinship-like interdependence, the affection and sympathy towards the vulnerable and the analogical logic of care in the cultivating practice. Delineating this culturally specific information

will advance the understanding of this semi-ritual artwork's expressive and mobilizing efficacy.

The Universality of Vulnerable 'Baby'

'*Bao-bao*' is not the only project among Liang Shaoji's silkworm artworks where he addresses the culturally conventional association between silkworm 'babies' and human offspring. Previously, the flat silk covered 'Beds / Nature Series No. 10' (1993-1999), was exhibited at the 48th Venice Biennale in 1999. Silkworms managed to wrap charred engine coils in the shape of mini-bed frames with silk threads (fig. 26), although they may have been repelled by the smell and felt uneasy while secreting flat rather than ellipsoidal cocoons on iron planes (see Chapter 2). As Liang confessed in the conversation with me in his studio, he once tried to twist the iron coils into the size of a cot for human infants only to realise that the dramatic effect of the enlarged bed undermined the artistic expression of his genuine care for the tiny silkworms. Liang emphasised: 'Only by making the bed frames to the scale of a silkworm's body size can I express the spirit of "*qi-wu*" *(齐物)*.' *Qi-wu* literally means equality among the myriad of things and beings, a Daoist notion stemming from the foundational ancient text of Daoism entitled '*Zhuangzi*', named after its philosopher author from the late Warring State period. Art critic Yang (2018: 126:) also notices the idea of '*qi-wu*' embodied in Liang's art practice where the artist manifests his compassion and respect for the life of insects.

However, if compared to '*Bao-bao*', Liang's approach in 'Beds' is rather anthropo-centrically wilful, manipulative and patriarchal. In the artist's implementation of the flat cocoon technique to complete this installation, the silkworms were deprived of the opportunity to naturally undergo their metamorphosis in natural cocoons but instead had to spin flat silk to wrap the iron bed frames against their biological instincts. Nor did the cot-shaped frames designed for human babies provide the silkworms as much protection from pathogens and natural enemies as a cocoon, whereas the silkworms in '*Bao-bao*' were allowed to spin conventional cocoons and moreover, their extra man-made shelters were made from red silk rather than cold, hard metal. The swaddling

Figure 26: 'Beds / Nature Series No. 10', 1993 (Photo: Xu Feixuan, 2018)

clothes made of silk fabrics share more morphological and functional similarities to raw-silk cocoons and thus provide an additional layer of protection for the pupae inside in a non-burdensome way. Rather than the manipulative and endangering manner in 'Beds' and the unease, confrontation and intervention it involves, '*Bao-bao*' is a more modest, gentle and careful approach to show care for these soft and fragile creatures.

As the plant scientist Natasha Myers (2015: 4) contends, an anthropomorphic mode to understand and communicate with non-humans 'in the right hands' can be a

remarkably helpful 'lure' in knowing and empathising with different 'mode of attentions', and therefore anthropomorphism should not be crudely criticised as an arrogant anthropocentric trap. It is always not an easy task to establish a 'mode of reference' between silkworm and human as Kohn (2013) suggests for more engaging trans-species communication. The silky swaddling cloth in the ritualistic work '*Bao-bao*' functions as a referential medium to make strong visual, material and psychological connections between infant silkworms and human beings. Moreover, the project's title 'baby' as an explicit reminder employs this affectionate address to facilitate the audience's perceptual and emotional reaction to the silkworm's vulnerability, susceptibility and dependency on human raisers. In this sense, although non-Chinese speaking audiences will miss the affective connotations in the Chinese idiom '*can bao-bao*' and the analogical cultivating strategies in silkworm farming in China, 'baby' can be a universal language and visual index to impress and engage the human audience. This ritual event of silkworm adoption has its cross-cultural efficacy despite the culture-bound origins in Chinese. Liang's innovative visual representation of this conception is powerful enough to welcome its audience to cherish, feel compassionate, and pay attention to vulnerable lives, either human or non-human. The audience then participated into this pre-settled ritual scene to adopt silkworm pupae swaddled in double layers of silk protection, by giving the adopted silkworm a name and filling the adoption card with written blessing words.

Adoption as Cultivating a Kinship

The adoption process in '*Bao-bao'* is a ritualistic act with the physical on-site presence of both the human audience and silkworm pupae in cocoons as ritual practitioners. It is cross-culturally valid to evoke an affective and emotional affinity between the human audience and silkworms. In these semi-linguistic and semi-pragmatic case studies, it has been shown that anthropomorphism can lead to positive modes of communicating and empathising with nonhumans. Pragmatically speaking, when silkworm larvae wrap themselves in ellipsoidal cocoons to undergo metamorphosis, they no longer need any help or care from their human raisers. The audience adopting a silkworm pupa in a cocoon was exempt from the labour-intensive cultivating toil which had been done by silkworm farmers and the artist beforehand. However, the adoption ritual can still be a

valid gesture to invite human viewers confronted with these swaddled silkworms to form a (symbolic) kinship with the creatures and meditate on the naturalness, or 'ziran' in human beings' cultivation of this domestic species, whose ambiguity has been discussed in Chapter 1.

The Chinese counterpart of the verb 'adopt' is '*ling-yang*' (领养), combining two characters of 'to claim or take' (领) and 'to cultivate' (养). As briefly introduced in Chapter 1, in both oral and written Chinese, '*yang*' is the most and almost the only verb to describe the activities of feeding, raising, hosting and nursing silkworms in the habitual phrase '*yang-can*' (养蚕). Apart from silkworms, objects of the verb '*yang*' range from living human and nonhuman organisms to more abstract concepts such a virtue, health, family and Daoist '*qi*' (气). Even virtually building kinship with a silkworm by adoption bears the responsibility of cultivation. To '*yang*' would never be 'to cultivate for the cultivation's sake'. Compared to 'cultivation' in English, *yang* in Chinese is more strategic, egoist and future oriented. There is always a purpose hinted at in '*yang*', a sometimes implicit unspoken 'for what'. *Yang* is teleological cultivation, where the pragmatic purpose can be as abstract as for moral cultivation and aesthetic taste or as material as for physical wellbeing and money. Those exact purposes of '*yang*' are mostly self-centred. You raise silkworms to make a living; you supervise and educate your children in case you have no one to take care of yourself when you get old (Liu 1998: 148); you serve your parents reverently so that you behave in the expected filial way (Knapp 2005: 114); you keep pets as a companion; you grow flowers and plants in your yard so that you can cultivate a calm temperament; you eat and exercise in a 'life-nourishing' way to maintain your wellbeing (Kuo 2013). However, the egoist purpose of the caregiver should not be confused with selfishness. Personalized cultivation for self-interest does not necessarily result in other parties' loss; more often it would be a win-win situation rather than a zero-sum game.

'*Yang*' requires the generative wisdom to make good judgement and figure out feasible cultivating strategies, which will guarantee a real 'good for me'. Hence, '*yang*' is embedded in a future-oriented temporality, with its clear goals to be realised sooner or

later. The machine needs maintaining work to be used for a longer period of time; the patients will convalesce after being careful fed and looked after. One keeps nourishing the body for promising longevity in '*yang-sheng*' (养生), while the constant cultivation of one's '*qi*' in '*yang-qi*' (养气) is life-long spiritual cultivation. The vision of the future via '*yang*' definitely involves the presence of oneself. '*Yang*' become a moderate control with the expectation to make future. A certain degree of control over oneself, over one's life and over one's relationships with others is worth pursuing, as the basis for hope and confidence in the present and future life. The execution of '*yang*' is triggered by personalised intention for certain purposes that can be envisioned in the near future. In this regard, when a person adopts a silkworm in '*Bao-bao*', it is not only the silkworm that was to be put under human care. The audience is supposed to cultivate more than an organism wrapped in material swaddles, but to cultivate an interest in nonhuman life forms, caring for the vulnerable, with a concern for complex relationality in domestication, a moral sense of species-egalitarianism and an open mindset to cross-species kinship in the adopter's after-ritual life.

Chapter 5: The Ultimate Rite of '*Ziran*'

'Broken Landscape' (2008-2016) is a special artwork in Liang's oeuvre as it embodies the most virtuosic techniques of the artist and manifests the most complex liminalities around the motif '*ziran*'. When '*Bao-bao*' (see Chapter 4) is examined as ritual art, all parties in the art nexus are present. When silkworms act as the prototype of silk in installations containing flat silk, the spinning creatures usually left the performing scenes after finishing their wrapping tasks; comparatively in '*Bao-bao*', silkworms were able to wrap themselves in conventional ellipsoidal cocoons in that adoption ritual and stayed in artificial silky shelters during the ceremony. 'Broken Landscape' in this sense takes a step further to retain the implementation of the flat cocoon technique while allowing the bodies and life traces of silkworms to remain in the ritual scene in material forms.

'Broken Landscape' contains a long thin rectangular piece of silk hanging from the ceiling of the gallery like a falling cascade. The lifespan of numerous silkworms from larvae to moths was spent and recorded on this yellowish variegated silk fabric. The creatures dispersed their faeces, urine and eggs everywhere whose physical traces are kept in their original forms as little black dots and pale brown marks on the textile (fig. 27). The rectangular shape of this silk cloth resembles the bound scroll of ancient Chinese paintings, usually on subjects such as landscape or plant and animal portraits. However, the colours and figures on 'Broken Landscape' are much more abstract than typical Chinese landscape paintings. This specific 'landscape' of silkworm's life courses including eating, shedding, excreting, spinning, mating and spawning, according to the artist's own statement (Liang 2008) which denotes the destruction of landscapes in China by human interventions and thus is named as 'broken'. Moreover, the Chinese character of 'broken' in its title, '*can*' (残) is a homophone of another Chinese character '蚕' (silkworm), who became the protagonist in this artwork.

Figure 27: 'Broken Landscape', 2016 (Photo: Xu Feixuan, 2018)

Traces of Life and Death

Silk is a common material used in traditional Chinese painting as canvas. In 'Broken Landscape', Liang no longer sought uncanny materials such as glass, metalwork and human skin to be the planes for silkworms to spin on. He instead chose a piece of rectangular silk 'cloth' but not reeled and woven from conventional cocoons. It was

instead made via the implementation of the flat cocoon technique as also used in making silk quilts. This type of silk thus looks thinner, lighter, airier and more translucent than ordinary silk fabric. Silkworms were placed on this flat silk spun by their deceased fellows to secrete more flat silk filaments to increase its thickness, and meanwhile, they dropped pale stains freely on it. Here the blurred borderline between the painting and the canvas visually and conceptually in 'Broken Landscape' is similar to the artistic manoeuvre in 'Planar Tunnel' analysed in Chapter 3. Nonetheless, this artwork traversed more boundaries in the unique way this rite of '*ziran*' was initiated by the artist. In other silk-wrapped installations using the flat cocoon technique, the flat silk floss is undoubtedly the art object while as the silk's prototype, silkworms acting as the behind-the-scenes providers of silk filaments were often excluded from exhibition spaces. In contrast, in 'Broken Landscape', it is ambiguous whether the silkworms as the organism or the silk as the material should occupy the position of 'art object' in the framework of 'art nexus'. When a silkworm's body, movement, metabolism, metamorphosis and its silk-secreting capability is spotlighted as 'art object', it would still be a valid inferential relationship between the worms and the silk. Silkworms can serve as the index of the existence of silk, either in the form of rectangular silk cloth as canvas or the fluffy silk floss newly spun over the previous layers. The silk filaments, too, can remind the audience of the agentive role of silkworms in the generation of this cherished fibre.

The physical presence of dried carcasses of silkworm moths and clumps of silkworm eggs on the silk cloth further denotes the liminality between naturalness and human intervention in this creature's life cycle. A large number of silkworm pupae in their cocoons are boiled to death when being processed in the silk industry. Meanwhile, those in the artist's studio, though being required to spin flat cocoons in an unnatural way against their habits, they were allowed to complete their metamorphosis into moths. These moths which were unable to fly stayed on the silk fabric till death in 'Broken Landscape', showing the natural end-of-life form of this animal. Furthermore, piles of newly laid silkworm eggs were scattered on the silk piece but did not yet hatch into their larval stage, because the eggs entered into a period of suspended development called diapause. Diapause is a physiological phenomenon where the silkworm temporarily

halts cell division and growth during the early stage of embryonic development especially in unfavourable environmental conditions. This mechanism allows silkworms to adapt their growing pace to seasonal changes in order to survive the cold winters when the low temperature would prevent mulberry trees from sprouting. Throughout the domestication history of silkworms, scientists have crossbred different varieties whose diapause period can vary from months to one year. In sericultural practice, freshly laid eggs were often frozen and stored by silkworm breeding companies where the eggs were 'cheated' to enter their diapause. Till the silkworm season comes, those frozen eggs will be transported to the 'hatching room' with strictly controlled temperature and humidity to be woken up. However, silkworm eggs in 'Broken Landscape' were left on the silk fabric at room temperature without being further processed as those in an agricultural context and therefore would probably stay in the form of tiny round particles for at least a few months. This artwork in this sense embodies the Daoist principle of 'non-action' and non-interference to the maximum extent compared to both the silkworm cultivation practice in sericulture and Liang's other art projects employing the flat cocoon technique.

The Appropriation of Smell in Art Space

When the audience merely witnessed the 'final' appearance of this installation shown in art exhibition settings, those mutating and erratic processes of silkworms' physiology and morphology and the silk fabrics' tangible traits were seldom accessible to the audience and critics of 'Broken Landscape'. Though being incorporated into the field of art, silkworm's faeces in the form of round black pellets (fig, 25), for example, are regarded as a by-product in silkworm husbandry. 'Silkworm sands', as Chinese farmers euphemistically call them, contain pathogens and thus are supposed to be recycled by professional companies for fermentation and sterilisation before being processed into organic fertilizers. In sericultural practice, many thrifty farmers, nevertheless, ignore the experts' recycling instructions and shovel their silkworms' faeces into sacks and pour them directly into their own farmlands where mulberry trees or rice were planted. While the farmers considered the faeces much more nutritious than chemical fertilisers that should not be wasted, sericultural experts condemned such short-sightedness as silkworm sands would pollute the soil and water nearby and cause more silkworm

diseases. Nor does Liang Shaoji intended to waste the silkworms' faeces, but his concern was not with their nutritional value or pathogenic danger, but with its visual form and symbolic potential as a heap of material entities for an art ritual. As for the urine, silkworm farmers often sprinkled a thin layer of lime powder over the silkworm plaque or the ground of the silkworm room for the larvae, as a means of absorbing moisture and thus preventing disease. When a mature fifth-instar silkworm climbed onto a vertically hanging lattice cocoon frame and was ready to cocoon, it stuck its 'asshole' out beyond its measured three-dimensional cocooning space to drain the last drop of the faeces and urine without soiling the frame or other cocoons under construction by its fellow silkworms. During my fieldwork in Yizhou County in Guangxi, I once heard an elderly lady jokingly comment: 'silkworms are well civilised, and they don't defecate indiscriminately.' However, in Liang's 'Broken Landscape', the artist intentionally condoned and even invited such 'uncivilised' open defecation.

When chatting with me about 'Broken Landscape', Liang recalled this artwork's local resonance when exhibited in the Netherlands, Germany and France throughout the years where it was enthusiastically praised by critics and the general public around the globe. Liang mentioned specific feedback he received overseas: 'More than one person told me afterwards that my artwork reminded them of Marcel Duchamp's "Fountain" as both "Fountain" and "Broken Landscape" deal with urine in some ways and employ Readymades.' Duchamp's famous or for some others notorious 'Fountain' (1917) is a men's urinal on display made of porcelain with the artist's signature. By choosing, rearranging and signing daily readymade objects into artworks, Duchamp challenged the original and skilful artistry of the professional and questioned the visual aesthetics as the essential value of art. Coincidentally these two works both tackle organisms' excreta, human being's or silkworms', with minimal intervention from the artists. Liang identified with the great influence of Duchamp in the contemporary art world but refused to acknowledge that his own project was inspired by this pioneering artist of Dadaism. While Duchamp confronts the readymades of industrialised society, Liang claimed that his own works deal with the emerging, growing and changing processes of organic life itself. In Liang's response to the comparison with Duchamp, the contemplation and practice of '*ziran*' in 'Broken Landscape' was repeatedly emphasised:

'Is "Broken Landscape" a Readymade? The spoiled fabric was not already existing but emerging and generated. I was not working within Duchamp's conceptual framework of readymade sculpture, but practising the Daoist philosophy of "ziran", where myriad matters flow naturally and contingently. Here I curated an environment for silkworms and a piece of silk cloth also made by silkworms to meet each other and stay together for a few days. The worms completed the artwork without me giving any order. I just waited along to see what would happen eventually and the realization of this artwork turned out to be an epiphany of what "ziran" is.'

I was not content with the straightforward hermeneutic dichotomy between Western industrial products and organic objects in Eastern naturalism. Superficially, the element of urine is implicitly present in both 'Fountain' and 'Broken Landscape'. It would be interesting to compare how the filth and stench as sensory associations with excreta would go through a purifying process before entering the artistic field of gallery spaces. The porcelain urinal in 'Fountain' was extracted from its daily-use context, namely a public men's toilet, clean and shining without any urine stains. The urinal with Duchamp's signature was bought brand-new and then repositioned, but one can imagine that if a used one was to be accepted on display in a museum it would have to be cleaned, deodorised and disinfected until it looked and smelt like a brand-new one.

In 'Broken Landscape', the handling of olfactory factors was subtler. The smell of silkworms' urine and faeces is hardly detectable to a human nose, according to my own experience living in the village raising silkworms. On the other hand, the odour of those droppings attracts silkworms' natural enemies such as bees and beetles as well as mosquitoes and flies who are commonly seen in rural farmhouses. Silkworm farmers in cultivating practice, therefore, have to do frequent cleaning and use screen doors and windows to keep those unwelcome insects out of the silkworms' rooms, while the artist didn't have to worry too much about this issue. The architectural design and management of museums and galleries are inherently inaccessible to most uninvited non-human creatures. As for the smell of 'Broken Landscape', there is another

unnoticed dimension in the pre-purification process of this artwork. The most unbearable stink that would appear in the whole life cycle of a silkworm comes from the sick ones infected with a contagious virus commonly known as the 'pus disease'. It is a common disease of silkworms, and apparently, silkworms with pus disease had been deprived of access to the artistic scene of 'Broken Landscape', neither their smelly bodies nor the white oozing pus.

I acquired this olfactory knowledge during my fieldwork in rural Yizhou as an apprentice to raise silkworms with local farmers. I often heard a saying by farmers and silkworm experts from the sericulture department of the local government: 'you walk by a silkworm house and the smell tells you whether the worms indoors are in good health or not.' Similar expressions would go like 'if silkworms are under good care, the room is aromatic' or 'good silkworms are aromatic'. I gradually built a valid connection between the signifier 'aromatic' and the linguistic signified smell when most silkworms in that village entered into their fifth instar. I walked along the alleys, knocked into neighbouring farmhouses to have a look at their silkworms, and most importantly, sniffed hard with my nose. The idea of 'aromatic' naturally blew into my mind and took a root, when I had sensed the whole spectrum of the smell of silkworms, not only the 'aromatic' but also 'not too good' and 'terrible smelling' ones within a few days. I haven't encountered any similar smell like that during my entire life experience. When farmers use a too general adjective 'aromatic', or in Chinese '*xiang*' (香) to denote the very familiar scent in their daily life, it used to be impossible for me to comprehend such expression. This cultivated sense is only communicable in certain situations with people of certain experience. One needs to have experience in raising silkworms in sufficiently large amounts in order to pick out the aroma as an index of silkworms' health. Many elementary school students in China have had the experience of raising silkworms at home when their teacher of nature science distributed five to ten silkworms for each pupil to keep in a paper or tin box. This kind of small-scale cultivating experience would not help to provide an idea of what 'aromatic silkworm' smells like. Rather, working within a community of silkworm farmers might faster the acquisition of such olfactory knowledge by making comparisons between various silkworm rooms of each family.

Sense of smell is important in caring for silkworms. A 'bad smell' in a silkworm room is a simple index of something wrong with silkworms' overall condition and reminds the feeders to be cautious and act accordingly. The excrement of the silkworm, including faecal matter and urine, generally have no detectable smell to human noses. However, if this organic matter is fermented because the room is too humid, the odour indoors would be slightly unpleasant. Farmers should then open the windows and doors to ventilate or use other methods to adjust the microclimate within their farmhouse. When the room became extremely smelly, farmers were aware that some silkworms had been infected by a cytoplasmic polyhedrosis virus commonly called 'pus disease'. The infected silkworms would crawl about, bobbing their heads around. The oozing pus on its body would not only exude contagious pathogens but also emit a disgusting odour. A farmer described those pus-filled silkworms 'as if a poisoned person with a messed-up brain and fishy smell'. As the lifespan of a silkworm is far too short, with a total lifecycle ranging from 6-8 weeks, it would be too late for pills or injections to take effect after diagnosis. A silkworm with 'pus disease' needs to be picked up and discarded to forestall the spread of the disease among tens of thousands of its healthy peers. Olfactory sensation thus provides indispensable information for farmers to timely adjust and cope with adverse factors to silkworm's wellbeing.

Liang Shaoji almost certainly possesses this olfactory knowledge about silkworms though the viewers of 'Broken Landscape' are hardly likely to be aware of what had been eliminated from the ritual scene in the gallery. The silk textile in 'Broken Landscape' is visually messy and grubby, but the olfactory presentation of it is still pure, clean and inoffensive, as sick stinking silkworms had been discarded and forbidden by the artists to enter into the arena of contemporary art. Similarly, although Duchamp attempted to mock the retinal pleasure of artwork, 'Fountain' is visually stainless and odourless. By juxtaposing these two artworks, excretion, waste and dirt have been materially appropriated, sensorily purified and conceptually challenged by Liang and Duchamp in their artistic strategies. It is notable that human being's fear of stains, death and disease still implicitly hover around like a phantom in art fields. The underlying filtering processes in these two projects guarantee the art space to be odourless, disease-free, clean and elegant.

The Frame of Artworks

While denying the stimulus of Duchamp in 'Broken Landscape', Liang Shaoji explained his true visual source of inspiration for this piece of work. When he reared silkworms in Linhai village with local farmers, the yellow urine stains of silkworms suddenly reminded Liang of the surfaces of ancient Chinese paintings. Both paper and silk were abundantly applied as the ground material for Chinese painting through history, sometimes with glue treatment to improve the canvas' water resistance. After hundreds or thousands of years of oxidation, most existing Chinese paintings from ancient times take on a yellowish undertone. The artist's association between yellow fabric and Chinese painting has a cultural specificity. Likewise, viewers with some basic knowledge of Chinese painting would be more likely to recognise the visual resemblance between 'Broken Landscape' and typical Chinese landscape paintings and thus understand the connotation of its title. It wouldn't be difficult for those who have seen some ancient Chinese landscape paintings to appreciate the visual aesthetics of 'Broken Landscape' namely its shape, colours, patterns and textures.

However, when I finished my trip to Shanghai where this artwork was on display at an art exhibition 'Growing' at Chronus Art Centre in April 2019, I went back to Guangxi Province and continued to conduct my field research on sericultural practice in Yizhou County. It was serendipity that I stumbled across another version of 'Broken Landscape' in an unexpected place. Yizhou Silkworm Breeding Station in the Hechi City of Guangxi is a government-funded silkworm egg production facility. Fresh cocoons were bought and carefully cut open; silkworm chrysalises undergoing a transformation from caterpillar to adult moth were then separated into two groups of male and female. Till the metamorphosis was completed, moths mated with each other of the same or a different variety according to the breeding requirements. The eggs laid by the female moths were processed and put into the market as a commodity. It was around 3: 30 pm that afternoon, the time when the silkworm pupae started to spread their wings into moths according to this species' biological clock. Workers at the breeding station were busy laying a piece of yellow cotton cloth with round holes of five centimetres in diameter on each bamboo plaque, on which silkworm pupae were already densely

Figure 28: Cotton clothes used at Yizhou Silkworm Breeding Station
(Photo: XU Feixuan, 2019)

placed. Adult moths who finished their morphological transformation gradually crawled up through the round holes onto the yellow-brown cloth, waiting to mate with another group of moths of the opposite sex (fig. 28).

A female worker explained the function of the cotton cloth with many round holes. The newly metamorphosed mature moth will urinate, and without the cotton cloth to absorb it the microclimate in every plaque would be too wet and challenging for other semi-pupae to spread their wings and become adult moths. The cotton clothes were washed, dried and then reused repeatedly, and as a result, were stained dark yellow and

brown by the urine of silkworms. I spent some time in the mating room of silkworms and squatted down to get a closer look at the cotton pieces on every plaque, with my camera zooming in on the texture of the cotton and the fluttering wings of active moths. There were other cleaned cotton clothes drying under the sun on the second-floor balcony of the facility building. Workers at the station used them with no extra care, but I was thinking of another piece of fabric, also yellowish with the life traces of silkworms, which was placed in a gallery space at that moment as a durational rite of '*ziran*'. A pile of cotton clothes in the breeding station are as visually appealing as 'Broken Landscape', but they are still functioning day by day, closely involved in the final stage of silkworms' social life. It seems that these clothes are closer to Duchampian 'Readymades', waiting to be 'elevated to the dignity of a work of art by the mere choice of an artist' (Breton 1935: 46).

The symbolic and visual similarities between these two kinds of fabrics and their polarised roles in human society point to the concept of 'frame' in social sciences. Frame theory was proposed by Goffman (1975) who argues that most human actions are determined by the frames, that is, those actions' contexts with certain expectations. Social roles, for example, determine the repertoire of actions people with such identities are supposed to perform, according to expectations constituted by social institutions. People often don't 'see' the frame unless it works inappropriately. The frame of artworks can be another obvious example to demonstrate how the often-neglected existence of a frame ensures that the audience will pay special respect, money or attention to the things within a frame as art objects (Gombrich 1979). A frame for art can be a physical frame for a painting, a glass display case, an exhibition hall or just the identity of an art project certified by art institutions. That might be one reason why the silk piece grown by Liang Shaoji and made by silkworms in 'Broken Landscape' can elicit much more response from its viewers than the cotton cloth used by breeders in a silkworm egg production station.

Nonetheless, if interpreting 'Broken Landscape' as a ritual instead of merely a conceptually and visually innovative 'landscape scroll' where the canvas and the painting merged together, the gap between this artwork and the cotton fabric for

utilitarian usage in silkworm farming practice becomes more obvious. 'Broken Landscape' as a rite of '*ziran*' was initiated by the artist's intention, where the roles of 'art object' and 'prototype' were so intertwined that they cannot be clearly assigned to the silk and silkworms. Silkworms acted as the protagonists of this ritual performance whose different life phases had been simultaneously recorded on the fabric. They were also the prototype of the thick silk flake, dictating its materiality in the pre-set conditions by the human artist. Meanwhile, silk is also counted as the art object in this ritual and its agency can be inferred when it carried the artist's intention, the embedded temporality of the ritual process and its own sensory traits. On the other hand, the silk as the prototype pointed to the material presence of the silkworm and the entangled relationship between the organism and the object. The enclosed boundary of the silkworm's body as a living creature becomes blurred when the silk can be regarded as the creature's external extension while the lifespan of the silk is much longer and thus can serve as durational evidence of silkworms' short-lived physical existence. The agency of silk hence is not only inferential when passively bearing and transmitting the projection of the artist's will. Silk also acts as the medium for the transcendence of the life of silkworms who died on it. That is why 'Broken Landscape' is better to be comprehended as a complex ritual encompassing rich liminal states namely between life and object, intervention and spontaneity, dirt and purity, art and artefact, wildness and domestication etc, while the categories such as 'installation' in contemporary artworld would fail to drive the audience attention to such richness.

Conclusion

This dissertation has probed into the material-semantic compositional strategies in Liang Shaoji's silkworm art series around the Daoism-influenced concept '*ziran*' from an anthropological perspective. His contemporary artworks including installations, performances and socially engaged art projects have been discussed as rituals within the analytical framework of Gell's (1992; 1998) 'art nexus' formula. This theoretical scope allows for this thesis's investigation into the artist's techniques of cultivating silkworms and making silk-based artworks, whose complex making-in-cultivating processes of art creation have not yet been sufficiently explored by previous art critics (e.g. Brouwer 2007; von Drathen 2011; Xia 2017; Yang 2018; Zulueta 2016). As I have argued (in Chapters 1 & 2), Liang's experimental art practice were rooted in sericultural science study and silkworm farming in contemporary China. His intensive collaborations with people in agricultural and scientific fields have granted him key support to realise his artistic visions. Furthermore, comparisons have been made between Liang's artistic skills and similar techniques in the hands of farmers and biologists to shed light on the ethical evaluation of his unique approach to silkworms in regard to the Daoist principle of 'following the way as it goes'. By considering Liang's silkworm artworks as rituals, the durational procedures of art-making and silkworm-cultivating ceased to be secondary and 'behind the stages' outside exhibition spaces, but instead became essential ritual processes that dictated the meaning and efficacy of these artistic events. Moreover, the inferential agency of the silkworm as organism and the silk as object in the art nexus have been unpacked (in Chapters 2 & 3) to more accurately understand the expressive effects of these works. Based on multi-species multi-sited ethnographic fieldwork in China with the artist along with silkworm farmers and sericultural scientists, this dissertation has re-examined the material arrangement and symbolic articulation of '*ziran*' in Liang's oeuvre which has often been misunderstood or over-simplified as a Daoist egalitarian cosmology of nature or a less-manipulative approach to animals. Referring back to archaeological findings on silk's ritual function in funerary rites in ancient China, I have offered new insights into how to understand the compositional pattern of 'wrapping in flat cocoons' that permeates most of Liang's silkworm projects,

by acknowledging the agentive role of silk as the material and spiritual medium to communicate with the supernatural and ferry the deceased to the otherworld (in Chapters 3 & 4). I have also examined the cross-cultural efficacy of anthropomorphic analogies conveyed in Liang's works in establishing a kinship-like trans-species bond between humans and silkworms in ritual scenes (in Chapter 4). As demonstrated in the previous chapters (especially in Chapter 5), Liang has effectively created paradoxes around the ecological motif '*ziran*' in his artworks namely between the modern and the preindustrial, organism and object, between growing and making, art and artefact, intervention and adaptation etc. These anti-structural liminalities of '*ziran*' in Liang's ritual art and have implications for the theoretical and methodological approaches towards his art practice.

Art and Agency Revisited

Though Gell's theory of art object's agency primarily stemmed from studies of artefacts in rituals in small-scale societies and has seldom been used in analysing contemporary artworks, the art nexus framework which consists four parties namely the artist, the prototype, the art object and the recipient fits well in dealing with the triangular social relations among the silk, the silkworm and the artist. The inferential agency in Gell's formula draws analytical attention to the way the artist's intention can be effectively realised relies on his mastery of artistic skills and mediated by the indexical art object' capability of pointing to its prototype. As for Liang Shaoji, the art nexus in most of his silkworm projects is clear-cut where silk threads are presented in the art scenes as the art object while silkworms serve as the prototype of silk they secreted. Also, the multivocality of silk in Liang's ritual art has been examined according to the way it had been physically cultivated and accumulated and the way it encountered objects made of other materials. As I have shown in previous case studies, the growing processes of silk threads either in the form of ellipsoidal cocoons or flat silk floss determined the symbolic and functional roles of silk in each ritual art event.

The interpretation of silk-silkworm assemblage in Liang's artworks should not be confined to the stereotypes in Chinese material culture where silk stands for higher social status, rarity and preciousness while silkworms are regarded as hard-working,

selfless and diligent silk producers. Rather, it is the tripartite dynamics among the artist, the silkworm and silk's agency that plays the crucial role in an artistic ritual's expression and efficacy. With reference to shamanic funeral rites in ancient China where silk acted as the spiritual medium, the richness of silk and silkworms' symbolic and functional potentials in ritual can be related to the dramatic process of a moth breaking out of the cocoon with the ellipsoid shape of the cocoon, the violent metamorphosis of the silkworm, the material traits of silk filament and even the homophonic characters of chrysalis and figurine in Chinese language (in Chapter 3). Contextualising Liang's art practice in Chinese ancient funeral ritual when silk had not yet been applied as daily clothing fabric evades the contemporary Silk Road discourse contaminated and appropriated by Chinese Communist Party's nationalist ideology which the artist too intentionally avoids. Meanwhile, the culture-bound interpretive pathway to Liang's art in this thesis is a conscious challenge to the hegemony of scientific discourse penetrating in the genre of bio-art in the contemporary art world where the anglophone STS (science and technology study) and posthuman theories almost dominate the analytical toolkits to examine artworks involving living organisms and biological technologies.

Compared to the ancient ritual meta-pattern of 'wrapping the dead with silk fabric', Liang's artistic technique takes a further step to invite silkworms to secrete silk filaments directly on various objects or bodies to be healed, caressed and reconciled. Instead of the ancients' using silk fabrics reeled and woven from cocoons to cover the corpse, silkworms in Liang's projects became the main ritual performers to enact the shamanic actions and thus trigger the supernatural power of each ritual via direct body contact. The flat silk flakes, therefore, entered ritual processes with the worms from the very beginning of the event and the co-presence of silk and silkworms complicated the processual interactions along with the artist's making-in-cultivating practice (in Chapters 3 & 4). In 'Snow Cover', for example, those discarded everyday objects have apparent symbolic meanings, denoting the minutiae of daily life in modern industrialised societies. It can be a healing ritual when these man-made things are gradually wrapped by flat silk floss. 'Snow Cover' is not an ironic criticism of industrialization and modernity by juxtaposing man-made objects and silkworm-made

organic silk materials as some critics contend (e.g. Gladston 2011; Xia 2015, 2017). By physically filling up the space among scattered objects on the table and joining them together under the silk cover, the silk symbolically mitigates the social dysfunction of modern life, mourning the ended social lives of inanimate artefacts, conciliating the abnormal social relations among persons, things and nonhuman organisms in this durational wrapping process. In some other projects among Liang's oeuvre such as 'Broken Landscape', the designation of the roles of silk and silkworm is not that definite. Traces of silkworms' excrement were left on a rectangular flat silk flake as the recordings of their life courses, and the bodies of these creatures remained on the fabric in the ritual scene in its final and initial form, namely dead moths and eggs in the diapause period. Silkworms were hence both the prototype and the art object in this art nexus, which further blurred the boundaries between the organism and silk as the object and pointed to liminalities of '*ziran*' in multiple senses (see below).

Conducting Fieldwork for Art Critique

Before delineating the complicatedness of '*ziran*' in Liang's art, the case study of 'Broken Landscape' (in Chapter 5) has shown the necessity of my conducting fieldwork as an anthropological method to better understand the nuances in his artistic techniques and expressions. My months' residency in a village to work with silkworm farmers and raise silkworms as an apprentice showed how the exhibited 'Broken Landscape' as an installation had excluded the stench of ill silkworms common in silkworm farming in agricultural contexts. The acquisition of this olfactory knowledge has fostered my critical comparison between Duchamp's 'Fountain' and this project from the perspective of the appropriation of sensory experience in art spaces. Similarly, it was also my inhabiting experience in rural farmhouses with silkworms that gave me insights into the mechanism of the flat cocoon technique, the application of hormones as accelerators of silkworms' growing pace in sericultural practice and the thread of fluoride as industrial pollution to the silkworm husbandry. These practical issues were intensely intertwined with Liang Shaoji's artistic experiments (in Chapter 1 and 2) and I, therefore, have argued that his silkworm art must be understood in the wider agricultural context of silkworm farming in China and proposed the term 'making-in-cultivating' to capture this indivisible feature of making art and cultivating silkworms in his artistic techniques.

Ethnographic fieldwork including intensive immersion in silkworm cultivation labour and informal talks plus semi-structured interviews with farmers, scientists and the artist gave me bodily multi-sensory knowledge about the silkworm as a creature and silkworm farming as an everyday toil and industry behind silk production. Moreover, mundane interactions with people closely involved in raising silkworms made me more familiar with the cultural context and linguistic corpus associated with human-silkworm sociality and I was thus able to unpack the overlooked subtleties in Liang's artistic expression. The flat cocoon technique which dominates Liang's art skills, for example, poses a greater health risk to the silkworm who would be more likely to fail to pupate and complete its metamorphosis after secreting silk on a flat plane, which has been a scientifically verified fact. Besides, silkworms may also suffer from unease, distress and discomfort when making flat cocoons either because of the eerie smell of flat plane's material or the surface's being too slippery to crawl on, some speculations based on the anthropomorphic empathy of Liang and a biologist I interviewed. When analysing the trans-species interaction in Liang's ritualistic art performances, the symbolic meanings of flat silk flakes and the ethical evaluation of Liang's art experiments, these consequences of implementing the flat cocoon technique should be taken into consideration carefully as I have illustrated the analysis of 'Self-roped' (in Chapter 3). Another exemplary case study of '*Bao-bao*' has shown how culturally particular habits and mindsets reflected in the spoken language during human-silkworm interactions in everyday raising scenes serve as important references for understanding Liang's silkworm projects. The common mentality of comparing silkworms to human infants is widely manifested in Chinese expressions such as the affectionate address 'silkworm baby', the analogies of 'sleeping time' for moulting periods and 'baby formula' for artificial fodder, and the folk doctoring logic of applying human-used antibiotics to treat silkworms' 'diarrhoea'. These implicit cultural contexts contribute to a more concrete understanding of the efficacy of this adoption ritual which invited the audience to establish an interspecies kinship with the worms (in Chapter 4).

The anthropological approach towards art places more emphasis on the functional aspect and the generated social relations in artworks beyond their aesthetic and

iconographic traits (e.g. Morphy 2013). As presented in each case study, accurate elucidations of the technical details in relation to the social interactions among persons, animals and materials are the basis for a comprehensive understanding of artistic efficacy and expression, while previous critics of Liang failed to trace the dynamic tension in Liang's collaboration with silkworms and therefore made superficial and erroneous ethical judgements without the support of solid facts (e.g. Yang 2018). More importantly, this sensitivity to artistic skills (Gell 1998), the social lives and orders of art objects (Miller 2005) and the entangled perceptive flow of the artist and the surrounding material flow (Ingold 2013) has driven this dissertation's exploration into Liang's art techniques and the agencies of silk and silkworms in the durational art-growing processes, where emerges the ambivalent liminalities of the motif '*ziran*' throughout Liang's thirty years art experiments.

This thesis experiments with ethnographic methods and writing style as a new genre or model of art criticism and thus urge art critics to adopt anthropological theories and practices in interpreting artworks. Art objects should not be alienated as discrete completed end products, especially those involve multispecies engagements in the art-generating processes. Instead, as this project presents, valid and reliable art interpretation should weave together living beings, energies, intentions and agencies that co-compose an art thing.

Liminalities of '*Ziran*'

The central thesis of this dissertation is that Liang's silkworm artworks particularly the '*Ziran* Series' are not a simple reflection of and adherence to fundamental Daoist principles but an innovative probe into the rich and ambiguous Daoism-flavoured concept '*ziran*' by attempting to generate various liminal states around this ecological idea during processual ritual events. When the multivocal '*ziran*' can denote everything ranging from 'nature,' 'naturalness,' 'what is spontaneously so', 'a non-assertive approach' and 'the way it intrinsically goes' etc., the liminalities of '*ziran*' explored in Liang's art involve threshold moments or situations about the passage of time, changes of social states, transitions of place, identity acquisition and ethical considerations (cf. Turner 1974). The inseparability of making (art objects) and cultivating (organisms) in

Liang's practice as discussed above makes the distinction between natural things and man-made objects untenable. '*Ziran*' is neither the antithesis nor antidote to industrial capitalism and Silkworms as organisms and silk as organic material are not inherently 'ziran' in the ways they are cultivated and made in the art field and beyond. Liang's approach to silkworms therefore is not always adherent to Daoist thought and their power dynamic remains uneven with various forms of intervention and manipulation.

Liang's 'making-in-cultivating' art experiments not only implement techniques already used in the silkworm farming industry such as hybridisation and flat cocoon but also gained inspiration from encounters in his everyday labour as exemplified in his hormone and music trials (in Chapter 1). Silk threads in his ritual art scenes were simultaneously 'cultivated' with its material accumulation in pre-set conditions by the artist and also 'made' to undergo an ontological transition in 'rite of passage' from agricultural settings to the art world (cf. Ingold and Hallam 2014). It is also ambivalent whether Liang's artistic skills in incorporating living silkworms into processual ritual performance is an adherence to the Daoist worship of spontaneity and non-action or rather an anthropocentric intervention and manipulation of nonhumans as the antithesis of '*ziran*'. The nature of silkworm cultivation can be inherently manipulative to exploit the silk-secreting capacity of this domesticated animal whose survival and reproduction are wholly dependent on their human feeders' care. Silkworm husbandry is modern when the international market of raw silk follows the logic of capitalism and large-scale silkworm raising is boosted by advanced biotechnologies such as cross-breeding and artificial feeds. Silkworm raising also has its 'pre-modern' facet when silkworm farming has not yet been mechanized and automated into farm factories as other cash domestic animals. Silkworm-mulberry alliance still asks for hands-on care and intense labour from farmers to resist the capitalist alienation of their bodies.

Implementing the flat cocoon technique is definitely human control to set a specific unusual condition for ready silkworms to secrete silk threads against their physiological habits. This making use of the silkworm's biological capacity, however, is not necessarily against 'natural laws'. It is natural instinct rather than the artist's enforcement that compels silkworms to secret flat silk even on uncomfortable flat planes, otherwise, they

would be poisoned to death by the excess of amino acids that cannot be excreted from their bodies. The artist has undoubtedly set up more difficult conditions, such as rusty metal and sweaty human skin for silkworms to endure and adapt to in his artworks, an asymmetry inter-species power relationship full of artificiality and unnaturalness. The flat silk floss grown under such conditions in Liang's projects is therefore by no means a representation of pure, organic, primaeval and uncontaminated nature juxtaposed with metalworks and plastic objects denoting modernity and industrialization as argued by critics (Xia 2017; Zulueta 2016). Rather, flat silk floss sits at the liminal state between being natural and unnatural. Silk is organic material spun by silkworms but in an artificially controlled physical shape while the silkworm is an ancient domesticated animal dependent on human care still sacrificing their lives halfway for the modern silk industry. The inherent paradoxes of silk as a 'natural' material and the 'natural' behaviour of the silkworm are most evident in two artworks with the application of the flat cocoon technique, namely the 'Planar Tunnels' and 'Broken Landscape' (in Chapter 3 and 5). Silkworms and Liang jointly dictated the form and meaning of the silk filaments in these two projects, whose collaborative processes can be understood as growth rituals to record life courses. Both artworks generated material entities in the durational ritual processes with complex connotations of '*ziran*', or naturalness, rather than transforming silk rashly assigned as being 'natural' into 'art objects' as if going through a 'rite of passage' to achieve a transition of status.

The adoption ritual in '*Bao-bao'*, as an exception, witnesses Liang's gentler, humbler and more discreet approach to silkworms where they were no longer required to spin flat silk but made conventional ellipsoidal cocoons to shield themselves. Human intervention was minimised when the artist merely added additional red silk swaddling clothes to the original cocoon layers as extra protection. This tactful strategy to establish visual, physical and cognitive associations between human infants and tiny silkworm pupae has a cross-cultural efficacy to call for the audience's attention and care for the vulnerable lives whether or not they understand the rich cultural practices of the 'silkworm baby' in the Chinese context. This is perhaps the most explicit manifestation of the Daoist ideal of 'the wholeness of heaven and humanity' (*tian-ren-he-yi*) that the artist Liang had endeavoured to pursue on his artistic journey. Such interspecies

harmony in this ritual artwork is unstable, ephemeral but intense, just as other liminal states initiated in Liang's silkworm series as a microcosm of Daoist all-encompassing organic cosmology where myriad things encounter and separate with emerging and dissolving confrontations in fluid organic cycles.

The Scope of Ritual Art

Examining Liang Shaoji's silkworm projects under the theoretical framework of ritual art has extended the research scope of art criticism on bio-art from focusing on stages from the completion of an artwork and its exhibition to the processes of preparation and production which were conventionally regarded as backstage periods. As this thesis has demonstrated, the making and cultivating processes as central to a ritual/artistic performance dictate the meaning and function of this durational event that require detailed and critical scrutiny from art critics. The anti-structural continuous liminal stages in Liang's ritual art, as noted above, keep refusing established categories of installation and performance as genres in the contemporary art world, questioning the ambiguous ethical stances between anthropocentric manipulation and creative intervention, and moreover, stirring reflection on clear-cut dichotomies around the notion '*ziran*' such as materiality and spirituality, organism and object, artificiality and naturalness.

Liang Shaoji's ritual art series pose further challenges to methods of classification and exhibition of art projects involving non-human life forms triggering ritual-like effects. For projects spanning over two decades such as 'Time and Permanence', how to engage the audience in a more enchanting and efficient way into this prolonged 'ritual of life' beyond just viewing the 'installation' at a certain moment of its growth as an 'end product' in the gallery space? I have briefly tackled this issue in collaboration with a hybrid artist-archivist-technologist. Kim and Xu (2019) explore how to use mixed reality technologies in virtualising Liang's silkworm art for both presenting and preserving purposes, which can be contextualised in sericulture practice as an intangible cultural heritage spreading across the world from China. The proposed model combines data curation, archival science and digital humanities strategies to capture the motions, the ephemeral and meditative Daoist ambience, erratic changes in materials and organisms

over time in Liang's silkworm projects. As we (ibid.) notice, Liang's artworks, as well as some other contemporary bio-art projects, feature biological growth, uncanny agency and interspecies sociality that challenge conventional notions of object, life and materiality. For art exhibition and preservation, art objects used to be the threshold or conveyer of narratives, concepts and thoughts with a physical boundary to be distinguished from other entities, while Liang's projects push the borderlines of art object into processual and durational ritual-like events, which requires new means to appreciate and approach. When visitors and critics are always absent from the growing and generating processes of art objects in ritual events and lack sufficient knowledge of the core repertoire of ritual art such as in Liang's silkworm series, the most creative and reflective subtle details and liminalities of his artistic practice have been overlooked, even leading to misinterpretation of the artworks. This thesis has shown how anthropological methods and theories can be productive and critical in studying a contemporary artist's practice featuring ecological thinking via biological means by framing his oeuvre as ritual art. However, it remains unsolved how to effectively present non-human inferential agencies in art rituals to the audience as well as how to capture the processual interactions among the artist, the prototype, the art object and the audience in an art nexus in contemporary art scenes, and whether the artist's exquisite technique or the remaining ritual objects are to be preserved and archived as heritages of cultural creativity. These intellectual vacuums await further interdisciplinary inquiries and collaboration.

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