

2016

PREPRINT 486

Elisabeth Hsu, Chee Han Lim

**Enskilment into the Environment: the *Yijin jing*
Worlds of *Jin* and *Qi***

Enskilment into the Environment: the *Yijin jing* Worlds of *Jin* and *Qi*

Elisabeth Hsu¹
Chee Han Lim²

Abstract

The *Yiji jing* 易筋經 (*The Canon for Supple Sinews*) of 1624 describes martial training currently practiced, particularly in Chinese communities. This article compares two forms that the two co-authors learnt in different places: Singapore and Kunming in the People's Republic of China. One form is known as the Hong Fist (*hongguan* 洪拳) version of the *Yijin jing*, the other was taught as a form of *qigong* 氣功. This article focuses on the training of the authors in their respective practice. It demonstrates that the techniques learned instilled in the authors an attentiveness to the meanings that shaped their practice. These meanings were not primarily comprehended in a cognitive fashion but felt and experienced. In particular, the materiality of the environment, or more precisely the resistances that the environment posed to a practitioner, appear to have shaped the practice of the *Yijin jing* in distinctive ways. As argued here, the practitioners enskilled themselves through their practices into a world of either *jin* 筋/勁 (sinew/power) or *qi* 氣 (breath/wind).

Key words: *Yijin jing* 易筋經, *qigong* 氣功, *jin1* 筋 (sinew), *jin4* 勁 (power), *qi* 氣 (breath/wind), enskilment

¹ Institute of Social and Cultural Anthropology, University of Oxford, United Kingdom

² SIM University, Singapore

Introduction

The *Yijin jing* 易筋經 (*The Canon for Supple Sinews*; also known as the *Sinews Transformation Classic*) is well-known for its martial training method, currently practiced in a variety of forms particularly in Chinese communities. This article discusses two of them, one learned as *qigong* 氣功 meditation, the other as a training method for the martial arts, the Hong Fist, *hongquan* 洪拳.³ Elisabeth Hsu learned a version of the postures outlined in the *Yijin jing* during her doctoral fieldwork in 1988–89 from a *qigong* healer with the pseudonym ‘Qiu’ in the backstreets of Kunming city, the capital of Yunnan province, in the People’s Republic of China (PRC). Lim Chee Han learned another version in Singapore from Lau, a practitioner of various Eastern martial arts, in his youth. In March 2010 Hsu showed Lim her version and asked to be taught his.

We discuss what Bruno Latour (2000) would call the “thing”, namely, the techniques that practitioners learn in the course of enacting the *Yijin jing* postures. To this end, we attend to the intentionalities that trigger their practice and to the sensory dimensions of the self, as experienced in the course of it. We take a distinctively phenomenological stance (e.g. Csordas 1994, Merleau-Ponty [1945]1962). Rather than engaging in a de-contextualized comparison of the different forms of *Yijin jing* practice, we aim to discuss the peculiarities of the environments on which practitioners work with their techniques. Ingold (2000) calls this process by which an organism attunes itself to its perceived environment “enskilment”.

Qigong and the Martial Arts in Academia

Much of what has been written about *qigong* and the martial arts comes in the form of instructional manuals. Scholarly research on the topic has been on the increase over the past two decades but remains scarce. It tends to focus on the social and symbolic dimensions of the movements or on ancient texts about forms of self-cultivation to which contemporary practice has been traced. There is a notable anthropological literature discussing *qigong* as a socio-political phenomenon in the PRC: crane *qigong* as a cathartic expression in the early reform era after the repressive years of the Cultural Revolution (1966–76) (Ots 1994); ubiquitously practiced *qigong* in parks, stadiums and at home, as widely observed in subsequent years (Chen 1995; Despeux 1997; Micollier 1999), during an era that has been

³ This research was made possible through the post-doctoral visiting fellowship in medical anthropology at Green Templeton College, Oxford, that Lim was awarded from January-March 2010; *yi jin* is a verb-noun idiom which means ‘to transform one’s sinews’.

interpreted as marked by a certain disillusionment with the state and a growing interest in the self (Hsu 1999); while in the 1990s, medicalized *qigong* became consolidated in palliative care and psychiatric wards (Chen 2003); or gave rise to distinctive worlds of *qigong*, within which it was pursued with religious fervor (Palmer 2007).

Ethnographies of the Chinese martial arts are few and far between; in contrast to the South and Southeast Asian forms (Alter 1992; Pauka 1998; Zarrilli 2000, Sieler 2015). The political history of the PRC does not feature centrally but transnationalism does: Alex Ryan (2002; 2008) researches *taijiquan* in the UK and Adam Frank (2006) discusses its practice in the PRC with constant allusion to its international audiences in Taiwan, Hong Kong and the United States. Ryan and Frank both are practitioners of *taijiquan*, but their focus has been on its social aspects, such as the identity of its practitioners, and they hardly discuss the martial “thing” in itself. Finally, there are the celebrated scholars in practitioner circles, who draw on textual Chinese and Japanese Daoist scholarship, include Despeux (1976; 1988; 1990; 1994; 1997), Kohn (2008a; 2008b; 2010; Kohn and Sakade 1989; Yamada 1989) and Engelhardt (1963; 1987).

This article contributes to the above literatures in three ways. First, the *Yijin jing* has not yet received much attention. Livia Kohn (2008a, 195–197) outlines its basic movements on just two pages of her history of Chinese healing exercises and Meir Shahar (2008, 149–165) goes into its textual history only in parts of a chapter of his magisterial study of a Shaolin monastery. Second, this article focuses on the “thing”, namely the techniques themselves, as learned through “participant experience”, a fieldwork method that combines participant observation with the process of going through a sufficiently thorough learning process to gain competence in the practice itself (Hsu 1999; Hsu 2007). Third, the article discusses the techniques as a form of “enskilment”, a learning process that involves the learners’ active engagement with and negotiation of the resistances of their surroundings. As Tim Ingold (2000) emphasizes, enskilment is a practice through which living organisms nest themselves into their social and material environment in order to dwell in it.

The Text of the *Yijinjing*

The *Yijin jing* of 1624 is an epitome of late Ming syncretism, according to Shahar (2008, 149–165). It is attributed to a certain Zongheng 宗衡 from Mount Tiantai in Zhejiang province, whose sobriquet was Zining Daoren 紫凝道人 (Man of the Way from the Purple Coagulation/Mist [Mountain]), which in the late Ming could refer to either a Daoist or a

Buddhist monk. The movements it discusses are thought to include Daoist routines of stretching and guiding *daoyin* 導引.⁴

Shahar (ibid., 165) notes that the *Yijin jing* was “the first to explicitly associate military, therapeutic, and religious goals in one training routine.” It became integral to martial arts exercises, and presumably originated from them. Its compiler Zining Daoren added two prefaces which link it to the martial tradition: one claims that the manual originated from Damo (Bodhidharma)⁵ and is signed by the Tang dynasty general Li Jing 李靖, the other is signed by the Song dynasty general Niu Gao 牛皋. However, after identifying anachronisms, scholars of the time already considered both prefaces forgeries. Zining Daoren clearly did not have their scholarship, rank and status.

Perhaps, *Yijin jing* practice survived mostly in popular contexts, for it is precisely from an adept of a popular tradition, *qigong* master Qiu, that Hsu became initiated into it (Hsu 1999, 21–87). Qiu traced the version he taught Hsu to Mount Wudang. For him, it combined therapeutic, martial and religious aspects.⁶ The version Lim learned, however, insists on its martial roots and relevance (in accordance to the Damo legend); it acknowledges its health-enhancing effects but no religious ones.

Qiu’s and Lim’s forms of the *Yijin jing* have family resemblances with one of the four styles of *jianshen qigong* 健身氣功 (health-building *qigong*)⁷ advocated by the PRC’s Chinese Health Qigong Association (CHQA)⁸ and known to the authors through a video in Mandarin Chinese (CHQA 2003).⁹ The video presents a performance of the *Yijin jing* version published by Wang Zuyuan in the *Neigong tushuo* 內功圖說 (*Illustrated Exposition of Internal Techniques*) of 1882, and reprinted by the PRC’s Ministry of Health in 1956.

⁴ The treatise advocates guarding the center (*shou zhong* 守中) and contains passages that point to a practice known from Daoist circles in medieval times, the method of absorbing *qi* from the sun and moon.

⁵ Damo purportedly invented the Shaolin martial arts and by extension, all styles of the martial arts. Legend states that on his visit to the Shaolin monastery, he encountered monks frail and sickly from long periods of meditation; hence he designed a series of exercises that formed the foundation of the Shaolin martial arts. Scholarly research shows that none of the above is likely (Henning 1999; Shahar 2008).

⁶ His current multi-storey home has a meditation room on the top floor, with Daoist and Buddhist iconography pasted onto its walls.

⁷ The other three are called *Wuqin xi* 五禽戲 (Five Animals Frolic), *Baduan jin* 八段錦 (Eight Sections Brocade), and *Liuzi jue* 六字訣 (Six-Worded Mnemonic).

⁸ This association, which is supervised by the State Sport General Administration, was founded after the Falun Gong incident of 1999 to regulate *qigong* practices in China. It organizes forums and seminars and publishes books and videos (in Mandarin and English) that show the correct movements for all four styles of *qigong*.

⁹ The differences between the text in the video and in the 1956 facsimile edition are minimal; for details, see Hsu & Lim (forthcoming). There are other versions of the *Yijin jing*, among them the *Shaolin Yijin jing* 少林易筋經, the *Damo Yijin jing* 達摩易筋經 and the *Weisheng Yijin jing* 衛生易筋經.

The *Yijin jing* and the Notion of Enskilment

The *Yijin jing* describes sequences of movements and/or postures. Thus, the version Lim learned in Singapore in the context of martial arts training consists of eight postures and a closing movement; the version Hsu learned in the context of practicing what Qiu called *qigong* consists of ten movements.¹⁰ One could view the *Yijin jing* as describing a set of body techniques, which in the course of their practice in different settings were altered over the past few hundred years. Body techniques differ, Mauss (1935) tells us, depending on culture; even if bodily movements like swinging one's hips when walking may appear natural, they are in fact culturally acquired.

In the case of the *Yijin jing* no one would doubt that the movements are acquired through culture-specific drills and discipline. Viewing its movements as a series of body techniques would emphasize "culture": the postures in the CHQA's video are similar to Lim's; incidentally, both are practiced by the urban middle class. Conversely, the body techniques advocated by the CHQA and enacted by Qiu, which evolved in a unique Chinese political context, both put *qi* centre stage, while Lim's Singaporean version did not.

Treating *qigong* and the martial arts as body techniques allows the researcher to identify symbolic aspects and the socio-political context in which these arts evolved but reveals little about the experiential dimensions of practicing *Yijin jing* movements, and any insights that may ensue from these experiences about the *Yijin jing*'s purpose, structure or history. Furthermore we aim to widen our investigation away from a focus on the body enveloped-by-skin, as the study of body techniques tends to do, to bodies-moving-through-their environment in order to identify the flows of power that these movements aim to generate. Hence Ingold's notion of enskilment proves useful.

While Mauss stresses that body techniques are culturally acquired through social transmission, Ingold (2000, 34–39) provides a critique of this notion of "enculturation", by emphasizing the practical involvement of an organism with its environment. He notes that, rather than the acquisition of rules, learning a craft is "inseparable from doing it" (Ingold 2000, 416). This process, which he calls "enskilment", requires an "education of one's

¹⁰ The facsimile of 1882 contains twelve depictions of postures, as does the version advocated by the CHQA. The latter additionally contains a closing movement (*shoushi* 收式). For a detailed analysis of the opening and closing movements, and their depiction, see Hsu (in press).

attention” (ibid., 22; Gibson 1979, 254) which typically happens through negotiating the materiality of the physical environment (ibid., 356).

Enskilment attends thus in a Latourian sense to the “thing”, even if the “thing” may be *qi* which for a natural scientist does not present “thingness” (in other words, not a “material” entity), but which for *qigong* practitioners has “thingness” in so far as it is a tangible, resistance-offering, impersonal aspect of the environment. While body techniques are often discussed detached from their environment, an enskilled movement is always directed towards it. The practitioner interacts creatively with the physicality of the environment in the course of becoming enskilled. Indeed, Hsu and Lim were made acutely aware of their body in the course of learning and teaching the movements of the *Yijin jing*. They experienced the structure of the skeleton and sinews, the seeming impossibility of a twist or a stretching of an arm, the altered and often slower breathing, and eventually an increasingly rhythmic movement. They also experienced, over and over again, the ground as unyielding yet ever-supportive.

The process of enskilment involves both the shaping of the body and the transformation of the environment such that one begins to experience the emergence of a common medium that pervades the two. Depending on whether the environment is a universe of *qi* 氣, as in the case of the *Yiji njing* being practiced as a form of *qigong* (as Hsu did in Kunming), or a human opponent brimming with *jin4* 勁, as in the martial arts (as Lim did in Singapore), will have an effect on how the movement is enacted.

Whether the common substrate is *qi* or *jin4*, and how it is felt and articulated is intrinsic not only to how the movements are practiced but also to the sorts of awareness the practitioner develops. For some, the transformation of one’s self-awareness that one experiences in the course of learning the *Yijin jing* bears the possibility of religious transcendence.¹¹ These dimensions of the Gibsonian “education of one’s attention”, however, go beyond Ingold’s discussion.

In the following, we account for variations in the movements and postures of Qiu’s and Lim’s *Yijin jing* routines by paying attention to their techniques of enskilling themselves into their

¹¹ In his discussion of meditation in the postface to *The Absent Body*, Leder (1990, 173) approximates such a transcendent moment with the following words: “This body’s roots reach down into the soil of an organismic vitality where the conscious mind cannot follow. Its branches spread throughout the universe... Through the lived body I open to the world. This body is not then simply a mass of matter or an obstructive force.”

respective environments. We begin with the version that Lim taught Hsu at Oxford in March 2010, followed by the one which Qiu taught Hsu in 1988–89.

The *Jin* of Lim's *Yijin jing*

Lim learned his version of the *Yijin jing* as part of his training in Hong Fist, a southern form of Chinese martial arts that involves low stable stances and powerful hand techniques.

Although Hong Fist has its own *qigong*-like exercise called “Iron-Wire Fist,” Lim’s instructor Lau felt that the *Yijin jing* provides a firm foundation for all martial styles and thus should be practiced by generalists like Lim. It is for this reason that Lim was taken in as a “private student” and was instructed in what Lau considered “universal principles of the Chinese martial arts”.

The practice of martial arts was associated with triad activities in the early days of Singapore’s independence¹², as it was in China during the late eighteenth and nineteenth centuries (Henning 1999: 327). This is, however, no longer the case. In Singapore, the martial arts by and large have lost their utility as a means of survival and currently only the middle-classes have the resources to indulge in them (Lim 2009). As Singapore became increasingly urbanized, martial arts training moved to residential areas like community badminton courts or training schools located in multi-story buildings. Lim learned his *Yijin jing* in Lau’s living room (from June 1998 to December 1999), which contained several pieces of training equipment, such as punching bags and a wooden mannequin that offered various forms of resistance.

The versions of the *Yijin jing* practiced by Lim and Qiu both began with an opening gesture that involved pressing the two palms against each other, with the fingers pointing upwards, as in prayer¹³. Qiu would stand still for a moment and gather himself in concentration; Lim would murmur a verse (*koujue* 口訣), a mnemonic that described the opening movements and posture:

¹² The Martial Arts Instructions Act, drawn up in 1974, was designed to prevent “secret society members and criminal elements from using martial arts training to further their own illegal purposes” (MHA 2003). Under the act, all martial arts instructors and trainees had to register with the authorities (Lim received a certificate for doing so in the early nineties). The act was repealed in 2003 as the authorities felt that triad activities have been brought under control. Lau was indeed involved in gang activities at some stage of his life, as Lim found out much later.

¹³ Qiu and his family adopted this gesture of prayer, while kneeling on a round cushion in Daoist and Buddhist temples.

下顎回收找喉頭，喉頭找玉枕，玉枕找百會，百會上頂。

Xia e hui shou zhao hou tou, hou tou zhao yu zhen, yu zhen zhao bai hui, bai hui shang ding.

The chin is retracted and reaches for the larynx, the larynx reaches for the *yuzhen* 玉枕 acupoint (at the back of the head), the *yuzhen* reaches for the *baihui* 百會 acupoint (at the top of the head), and the *baihui* props upwards.

垂肩落肘，含胸拔背，小腹收起，大腹鼓起，會陰向前，命門向後，尾閭向下。

Chui jian luo zhou, han xiong ba bei, xiao fu shou qi, da fu gu qi, hui yin xiang qian, ming men xiang hou, wei lü xiang xia.

Drop the shoulders and the elbows, relax the chest and expand the back, contract the lower abdomen, expand the upper abdomen, push the *huiyin* 會陰 acupoint (between the anus and the genitals) forward, push the *mingmen* 命門 acupoint (between the kidneys) backward, and push the coccyx *wei lü* 尾閭 down to the ground.

膝蓋微曲，腳趾內扣。

Xi gai wei qu, jiao zhi nei kou

Bend the knees slightly, point the toes inwards and lock them into position.

Lim explained that some styles of *qigong* instructed one to feel one's *baihui* “being lead” to the top (*baihui shang ling* 百會上領), as though one were dangling from a rope that went into heaven. However, in the *Yijin jing* version Lim taught Hsu, as the *koujue* clearly states, the *baihui* should “push upwards” (*baihui shang ding* 百會上頂). Although the differences between *ling* “being lead” upwards and “push” upwards appear insignificant, they are

important indicators of the environmental modalities that shape one's posture and inner sensations, and how one relates to the world. For instance, if one were to merely dangle from heaven, the spine would be relaxed instead of taut, one would feel that one was pulled by external forces instead of pushing with internal strength, and the environment would be something one dissolves into, instead of something one struggles against.

The opening posture required one to be connected to the sky and rooted to the earth in a straight line. Lim hit Hsu's shoulders with his palms held vertically to make sure she was standing straight, her heels glued to the ground, where she could feel his force go. She was supposed to contract her lower abdomen, the cinnabar field *dantian* 丹田, or rather, to experience it as contracting; (as per the *koujue*, the *huiyin* was to point forward, as if it were pulled forward on a hook; the *mingmen* was to point backwards and the coccyx *wei lü* downwards.) This would ensure that her lower spine was straight, rather than curved in the S-shape which is portrayed as "natural" in Western anatomy books. To Hsu, it appeared a sheer impossibility to stand so straight—in a relaxed fashion—and feel the force go from her shoulder along the spine straight into her heels, without feeling off balance.

Hsu and Lim learned the *Yijin jing* movements in an enclosed space (Hsu, in a college squash court and Lim, in his instructor's living room), and Hsu, in particular, experienced the training environment as one consisting of strikes delivered from different directions.

Enskilment into this environment involved retaining her balance by moving vertically up and down, as she had not yet developed the internal strength to stay totally still. To keep her in place, she was hit from all sides. The physical demands caused Hsu to sweat, and sometimes, her bodily frame spontaneously started to shake and tremble in pain. Lim's enskilment into the environment was a degree harder. He had to kick or punch the wooden floor and concrete walls, and was often beaten with a wooden pole by Lau. This made his body taut and attentive, ready to strike back at any attack. Lim often spoke of resisting the environment's *jin4*, a tangible force central to the practice of the Chinese martial arts (Chen [1943] 2014). the tangible hits and strokes, through which *jin4* manifests itself, exude with power, strength, balance, and sensitivity, no less than does the practitioner's attentive, taut body itself. Importantly, this sort of power, *jin4*, is constitutive of both the body and the environment. Lim's training modalities and his experience of them made this evident.

Enskilment into *jin4*-power furthermore requires the ability to *fangsong* 放鬆. Although *fangsong* generally means to "relax", Lau wanted Lim to consider its literal translation as "to let go and be a pine tree." This literal translation is actually incorrect, but it plays on a

homophony that carries practical implications: to *fangsong* while practicing the *Yijin jing* requires one to relax yet simultaneously remain as still and unmovable as does a pine tree. As Lim had learned from his teacher, “a tree stands alone doing nothing and thinking nothing while it is battered by wind and water, but the moment you punch it, your broken bones will teach you that remaining unmoved is the tree’s way of striking back.” The pine tree thus not only stands for the pinnacle of martial excellence, but also represents how to respond to powerful strikes by assuming a calm and ever-present *jin4*-power within a state of stillness.

After reciting the *koujue*, where palms were pressed against each other as in a prayer position, Lim showed Hsu the movements of the first posture. He rotated his palms so that his fingers pointed forward. He then pushed his palms forward, pressed tightly against each other, straight in front of his chest until his elbows could almost touch each other. Then, he turned his palms upward, such that they faced the ceiling, stretched out the arms to both sides and lifted them until the hands were high above the head, with palms facing each other. He then pressed the palms against each other, instead of using them to prop up the sky, as in the other three *Yijin jing* versions, and lowered them, thereby reassuming the initial position. This first posture ended in a movement not found in the other three *Yijin jing* versions; it consisted of opening and closing the space between the palms three times. This last movement, much like those of the entire *Yijin jing* routine, was supposed to work the sinews, *jin1*, between the shoulder blades. Lim stressed that neither back muscles nor triceps would bring about the wanted effect. For developing one’s *jin4*, one had to work the *jin1*.

The movement of the *jin1* between the shoulder blades was meant to stretch one’s upper back and work the cavity between the shoulder blades. Lim tried to explain the different ways in which one can work on the *jin1* between the shoulder blades. If he did it correctly, the horizontally-held forearms would be parallel to the ground and parallel to the surface of the chest during this movement. By contrast, if he used his trapezius and *latissimus dorsi* muscles, the forearm would be raised at the elbows. Hsu, the beginner, previously completely unaware of this aspect of her bodily structure, was told to pay attention to the visual cues, but Lim, the trained practitioner, could perceive and apprehend the *jin1* in terms of their tactile quality: if he did this movement correctly, Lim would feel a linear form of power, tensile strength, control and rootedness.

Lim also showed how a minor movement, such as a slight inward rotation of the palms that were pressing against each other, effected a sinewy stretch on the outer side of the forearm and simultaneously gave one the feeling that the shoulder blades were opening. However,

even though Hsu gained awareness of her *jin1* over the course of the one month she trained daily with Lim, she never acquired the skill to work them. This small episode highlights that a seemingly intractable materiality has to be negotiated in the course of enskilling oneself into a new environment.

The second posture, “to pluck the stars and reverse the dipper” (*zhaixing huandou* 摘星換), was in Lim’s version of the *Yijin jing* a strike. It was a side-kick, which involved a diagonal extension of one’s spine, shoulder blades, and one straightened leg. Along this diagonal line, the elbow of one arm pointed upwards, with the forearm dangling down in relaxation, and the elbow of the other arm was stretched out with a taut forearm that rotated the horizontally held palm inward. If one placed the shoulder above the heels precisely, Lim explained, it was possible to issue the kick with ease, simply by contracting the lower abdomen and thereby straightening the spine. By getting Hsu to drive her heel with *jin4*-power into the floor, Lim sought to teach her how to feel, resist, and connect to the ground; the *jin4*-impact that she felt on the outside was attributed to skillful channeling of *jin4*-energy inside.

The notion of *jin4* encompasses not merely power and strength, but also sensitivity and a sense of balance. The third posture, called “twisting and pulling the oxen’s tails” (*daozhuai niuwei* 倒拽牛尾), developed these qualities of *jin4*, as did the sixth and seventh. The third posture began in the same position as the first one where the feet were kept parallel to each other, side by side, but then required the practitioner to make a step back. It consisted of a combination of pushing and pulling movements, as the weight of one’s body shifted from the front to the back leg, and vice versa. Lim told Hsu to push with one arm forward, as the other arm went backward, palm facing down, and held horizontally parallel to the ground. Once the arm was horizontally stretched out, Hsu was told to concentrate her volition on the palm that now was held erect and widely opened, each finger being kept as distant as possible from the other one. This should work the *jin*-sinews within the hand, Lim explained. As this hand was turned around, the fingers were folded into a fist, which was pulled horizontally back to underneath one’s armpit. Meanwhile the other stretched out arm was retracted and extended to the fore, shoulder locked into position through rotating the opened palm such that the smallest finger was on top and the thumb pointed to the ground. These movements trained the sinews, *jin1*, of the hand, the wrist, the shoulder, and the lower spine, without which one could not sense and control the exchange of power, *jin4*, between two persons as they push and pull one another.

Each of the following postures had a practical purpose and should improve one's *jin1* sensitivities and *jin4* powers in different parts of the body. Lim understood the *Yijin jing* to build up one's martial skills by training one's *jin4* and *jin1*. He claimed that the version he taught was “minimalist,” both in regard of the movement and the names for them. For example, the fifth posture, known as “Nine ghosts drawing the horse saber” *jiugui bama dao* 九鬼拔馬刀 in Wang Zuyuan's text and the CHQA's video, was in Lim's version named matter-of-factly “Draw the horse saber;” no ghosts were mentioned. In the CHQA's video the posture involved bending the torso. It looked baroque to Lim, as it appeared to have no effect on the sinews. It resembled a well-known exercise in Western gymnastics to Hsu. Without dismissing Hsu's guess, Lim then pointed out that the soft and round bending movement may be indicative of enskilment into an environment filled with *qi*. Evidently, the logic of the movements in the different versions of the *Yijin jing* seemed to depend on the environments into which the practitioner became enskilled.

Enskilling into *Jin* with Lau's *Yijin jing*

Lim taught Hsu a sequence of postures of holding still, rather than a string of movements flowing into each other. Assuming a posture demanded that she retain *jin4* in her *jin1* while standing rooted to the ground and reaching up to the sky, holding still in this position for several minutes. Needless to say, this required enormous concentration (*yinian* 意念), and it was also painful. However, after training with Lim for only a month Hsu noticed significant changes in her body and perception.

Lim's sequence comprised eight postures, followed by a closing movement:

1. Skanda offers his vajra club (*weituo xianchu* 韋馱獻杵)
2. Pluck the stars and reverse the dipper (*zhaixing huandou* 摘星換斗)
3. Twisting and pulling the oxen's tails (*daozhuai niuwei* 倒拽牛尾)
4. Draw the horse saber (*ba madao* 拔馬刀)
5. Extending the claws and spreading the wings (*chuzhua liangchi* 出爪亮翅)
6. The crouching tiger lunges at its prey (*wohu pushi* 卧虎扑食)
7. Three plates drop to the floor (*sanpan luodi* 三盤落地)
8. Wagging the tail (*diaowei* 掉尾)
9. Scooping *qi* and pouring it into the top (*pengqi guanding* 捧氣灌頂)

The above eight postures are considered to develop strength in and control over the sinews, *jin1*, in the shoulders and between the shoulder blades (movement 1); connecting the

shoulders to the lower spine and the heels (movement 2); between the fingers, in the wrist, between the ribs, in the lower spine and the abdomen (movement 3); between the ribs and in the spine (movement 4); between the shoulder blades and the fingers, and in the shoulders and the wrists (movement 5); the spine and the entire frontal torso from the chest to lower abdomen (movement 6); connecting the torso to the hands and feet (movement 7); and lastly, the lower spine, the waist, hips and neck (movement 8).

Lim noted that the *Yijin jing* did not provide a complete body building repertoire. Therefore, he trained daily for 90 minutes another set of exercises that strengthened his *jin1* and developed his *jin4* more comprehensively. For Hsu, a month of daily one-hour-long sessions led to subcutaneous fat loss, the most evident loss resulting in her lower abdomen becoming completely flat. More importantly, the training had a lasting effect on her posture and her ability to engage in other physical activities with a newly acquired awareness of how to implicate her skeletal structure into them and reduce “muscular” efforts.

Whenever Hsu spoke of muscle ache and muscle power Lim corrected her, “You must stop thinking about this thing called ‘muscle’. The book is called *Yijin jing*, not *Yiji jing* 易肌經 (*Canon for Supple Muscles*); the muscles are external and fragmented, while the sinews are internal and integrated. Muscle power is crude, the *jin4* delivered via the *jin1* is subtle.” While sports mechanics and physiology attempt to measure their impact, the *jin4* events Lim spoke of are not recognized as such by Western biomedicine. Meanwhile, Hsu’s training centered on acquiring a sensitivity to this subtle tangibility through repeated imitation of precisely choreographed movements that caused sinewy stretches and other unusual sensations. The negotiation of this tangibility enskilled her into an environment of mostly invisible, yet very tangible forces, to which she became attentive as potential sources of “attack” from all sides. The *jin4* in Hsu’s *jin1*, indispensable for combat, survival, and the form of “dwelling” that Lim’s martial version of the *Yijin jing* taught her, was ultimately encountered through its presence in the wooden floor and concrete wall, and in Lim’s hits and slaps.

Enskilling into Qi with Qiu’s *Yijin jing*

Some twenty years earlier, Hsu had learned movements of the *Yijin jing* from *qigong* master Qiu. Qiu worked as a *qigong* healer in his private practice on what was commonly called “the street of the poor” (*pinminjie* 貧民街), where petty enterprise flourished. Like Lim, Qiu considered the *Yijin jing* movements suitable only for beginners. It was insufficient if one wanted to attain a state in which one could see the light and feel the glow that was so central

to recovering one's vitality. This was particularly so, Qiu said, after treating patients by emitting his *qi* onto them in order to manipulate theirs. In autumn 1988, shortly after Hsu became acquainted Qiu and his family, Qiu agreed to teach her. This happened in daily sessions of about an hour over two months in a park at dusk.

At the time, in 1988, Qiu told Hsu the names of each movement, but because the martial arts were veiled in secrecy, Hsu refrained from asking him to write the names down. 21 years later into the Dengist reform era, in summer 2009, acquaintanceship with a foreigner was no longer as stigmatized as it had previously been. Qiu now agreed to name the movements, while one of his disciples wrote them down:

1. Skanda makes an offering to Buddha (*Weituo xianfo* 韋馱獻佛)
2. Topple mountains and overturn seas (*paishan daohai* 排山倒海)
3. Pluck the stars and reverse the dipper (*zhaixing huandou* 摘星換斗)
4. The immortal presses onto the water (*xianren yashui* 仙人壓水)
5. Turn the head backwards and look at the moon (*huitou wangyue* 回頭望月)
6. Nine oxen pulled by their tails (*jiuniu bawei* 九牛拔尾)
7. The blue-green dragon surveys its claws (*qinglong tanzhua* 青龍探爪)
8. The hungry tiger lunges at its prey (*ehu pushi* 餓虎扑食)
9. Welcome the wind while looking at one's palms (*yingfeng kanzhang* 迎風看掌)
10. Receiving *qi* and returning to the primordial origin (*shouqi huanyuan* 收氣還元)

Some names are exactly the same as those in the other three versions,¹⁴ while others are different, but what is most conspicuous is that the order of the movements differs significantly, an observation discussed in more detail below. Unlike Lim, Qiu barely gave any explanations. The names of Qiu's movement hint at a “body ecologic,” a body that is ontologically continuous with its environment and that extends beyond the body-enveloped-by-skin into the surrounding ecologies (Hsu 2007). Qiu's names of the movements refer to the mountains and the sea, the stars and their constellations, like the dipper, to wind and water, the moon and *qi*. Or they refer to animals known for their strength: the nine oxen, the blue-green dragon, and the hungry (rather than the crouching) tiger. They also mention body parts, such as the tail, the head, the claws, and the palms. Apart from the Buddhist allusion to Skanda and the Buddha, the names invoke also the immortals and the primordial origins, *yuan* 元, which are particularly vivid in the Daoist imagination.

¹⁴ Qiu's movement 1 is comparable to Lim's movement 1, 2 to 5, 4 to 7, 3 to 2, 5 to 4, 6 to 3, 8 to 6, and 10 to 8 see Hsu and Lim (forthcoming).

In Qiu's, as in Lim's, version of the *Yijin jing* the word *qi* is mentioned only in the names of the closing movements. However, there are hints that *qi* may have been central to all of Qiu's movements. First, Qiu taught movements which flowed into each other rather than discrete postures. Second, he always practiced the *Yijin jing* in parks, among the trees, *en plein air*, inhaling fresh *qi*. Third, although he spoke neither of *jin1/jin4*, as did Lim, nor of *qigan* 氣感 (feelings of *qi*) and *qi* circulation, as many *qigong* practitioners in the commercial sector do, Qiu's movements appeared to be geared towards the environment, reaching an increasingly greater exchange of *qi* with the environment. This last point builds on Hsu's "participant experience" of learning his *Yijin jing* routine and the phenomenology of the movements she learned.

Unlike Lim, Qiu never provided explanations on how to do the movements, what to pay attention to, and why they were to be practiced in the way he did. He merely demanded that Hsu imitate him and he only occasionally gently pulled and pushed her into the right position. Today, Hsu still does not dare to claim to have reproduced the movements accurately, although Qiu did review her practice after seven, fifteen and twenty-one years respectively. Nor does it feel right, given that Qiu barely discussed the movements, to provide a description of them. However, since she engaged in "participant experience," she can comment on the effects these movements had on her. They caused distinctive sensations, some unusual, others painful. She also sensed sinewy stretches which she was told to conceptualize as activating the flow of *qi*. Furthermore, the movements affected her breathing. Over the course of the approximately thirty minutes she took to practice the entire sequence, her breathing became increasingly deeper, and she never managed to practice the seventh movement, "The hungry tiger lunges at his prey," without panting. Details of the effects of each movement on her breathing are outlined below.

The second movement, "Pushing of the mountains into the sea," would usually slow down her breathing, as she exhaled while pushing and inhaled while pulling the arms back. Each of Qiu's movements was to be repeated seven times, a recommendation found also in Wang Zuyuan (1956:52). This ensured that the breathing would become very regular before a new posture was adopted.

The fourth movement, "The immortal presses onto the water," would usually make her breathe more deeply. It was a movement that should be practiced with one's arms only, while keeping bent legs rooted to the ground. One exhales while pushing downwards, palms held parallel to the ground, open face-down, but inwardly inverted so that the finger tips touched

each other. One inhales while pulling up one's palms that now are upwardly open, to above the head. This movement had an undeniable effect on deepening Hsu's breathing.

The sixth movement, "The nine oxen pulled by their tails," would deepen the breathing even more. It required one to do a very slow and long drawn out movement of pulling with both arms from the left to the right, or vice versa. This lowered one's point of gravity, as the leg on which one rested was now strongly bent. The other outstretched out leg was gradually bent as one shifted one's body's gravity onto it, while imagining pulling nine oxen by their tails. The shifting of one's gravity had a perceptible effect on the depth of one's breathing.

Finally, the eighth movement, "The hungry tiger lunges at its prey," required one to tilt the body and shift the center of gravity toward the five fingers of each hand that one stuck in front of oneself into the ground, on either the left or right side. The face and torso were then slowly pushed forward along the ground, and earthy odors inhaled, as one stretched one's chest and lungs, and eventually raised the head and contracted the nape. The tilting of one's gravity, the earthy odors and the stretching of one's chest all worked towards a drawn out and fully conscious inhalation.

Notably, the above four movements were all performed in a position where the feet were apart, parallel to each other, such that one stood with bent legs and a lowered center of gravity firmly rooted and broadly positioned on the ground. While the spine had to be kept straight, and the head vertically connected to the sky.

In the above four positions the lungs felt like a container that could be filled with *qi*. In between them there were three movements, which Qiu practiced with legs crossed over, cross-legged feet parallel and close by each other: "Plucking the stars and reversing the dipper" involved a stretching of the torso, "Turning one's head and looking at the moon" effected a twisting of the torso, and "The blue-green dragon surveying its claws" resulted in a bending of the torso. These three latter movements likewise stretched the sinews and caused unusual sensations, and performed in this sequence, they also deepened one's breathing.

While Qiu never provided a rationale for his movements, after many years of practice Hsu identified a pattern that gave them a rationale. She saw a pattern of alternation of the broad postures (movements, 2, 4, 6, 8, and 9) and the postures with crossed legs (movements 3, 5, and 7). The rationale for the sequencing of Qiu's movements lay in the deepening of one's breathing. Although Qiu himself barely made any allusion to *qi*, Hsu felt that these movements enskilled her into a universe with which she would engage in an ever more drawn out and deeper exchange of *qi*. This altered breathing would bring with it a sense of

tranquility, which resulted in an heightened awareness and increased pleasure of the quiet parks and garden landscapes where Qiu had her do this “*qigong*” practice.¹⁵

Overlaps and Layers

Our focus on enskilment has allowed us to account for differences in how the *Yijin jing* is being practiced by identifying the materiality of the environment with which the practitioners engages. Lim said he paid attention to *jin1* but Qiu did not comment on his movements. There is no doubt that Lim practiced the *Yijin jing* to train the *jin1* and *jin4*, as he attended with sensitivity to their elasticity. He had not only trained with a Chinese medical doctor in his youth but also with martial arts masters, and he would spend most of his time at dawn and dusk training martial techniques of hitting and kicking. The movements Hsu had learnt from Qiu also stretched the sinews, *jin1*, but in a way that she experienced as affecting mostly her breathing, and what felt like an eased flow of *qi*.

Similarly, although Lim practiced the *Yijin jing* in a room, there is no doubt that this was meant to enhance his “body ecologic” that encompasses both “the inside and the outside of the physical body” (Hsu 1999:82). The names of the postures Lim practiced, much like Qiu’s, alluded to a textured cosmos with stars, mountains and oceans, immortals and dragons, wind and water, trees and grass. They became manifested in the resistive qualities of the walls, floors, pine trees, and strikes from Lau in response to which Lim developed the sensitivity towards them in his *jin1*, and the ability to fight back with his *jin4*. The “body ecologic” he cared for did not consist of *qi* but of *jin4*. Lim hardly mentioned the role of breathing and he did not instruct Hsu to focus on her breath, nor had Qiu done so. Lim considered “right breathing” a non-entity and remarked that breathing was a natural consequence of having a strong command over *jin4* and *jin1*.

Clearly, there are family resemblances between Lim’s and Qiu’s practice. A family resemblance, for instance, can be seen in the closing postures, namely “Scooping *qi* and pouring it into the top” in Lim’s version and “Retrieving *qi* and returning it to its origin” in Qiu’s. The names of these closing postures or movements were the only ones to mention *qi* (but neither of these names figures in Wang Zuyuan’s or CHQA’s version).

¹⁵ As Farquhar and Zhang (2005) observed in their fieldwork in Beijing, “pleasure” was reported as one of the primary experiences from and reasons for practicing life-nurturing (*yangsheng* 養生) practices. See also Farquhar and Zhang (2012).

To Lim, the closing movements were supple and circular, rather than taut and linear, like the preceding postures. The transition was sudden and striking. One stretches out one's arms sideways with palms facing up. One then lifts the palms to the top of the head and performs a gesture of pouring *qi* onto it (the *baihui* acupoint). The hands are then brought down; they run along the side of the face to the collarbone, to underneath the armpits, to the spine and along it over the *mingmen* acupoint to the coccyx, whence the middle fingers follow the back of one's thighs and calves to one's ankles, which they circle. Then, one presses one's palms against the back of the feet before sweeping over the toes across the ground, and finally brings the palms back to rest over one's *dantian*. The movements clearly suggest that Lim's closing posture retrieved *qi* into the *dantian*.

It is possible that the closing posture in Lim's version of the *Yijin jing* is a later addition to the preceding set of eight. The training Lim provided would also suggest this. Lim taught Hsu how to endow her body with an inner *jin* by hitting hard onto her shoulders, elbows, hips, legs, lower back and even by mockingly punching her lower abdomen. These training methods he used for every single posture, except for this last one. Likewise, it is possible that Qiu's practice once ended in the ninth rather than the tenth posture.¹⁶

The above focus on enskilment in *Yijin jing* routines highlighted salient differences between Lim's and Qiu's versions of practicing the *Yijin jing*, but it also pointed to family resemblances. Clearly, the different forms of *Yijin jing* practice show overlaps, and it cannot be dismissed entirely that *Yijin jing* routines comprise movements from different provenances. However, no attempt has been made here to disentangle layers or trace lineages. Rather, we aim to highlight that the techniques we learned varied in form and orientation, strength and imagination, and to focus on whether we were enskilling ourselves into an environment of *jin* or *qi*.

Discussion

By accounting for body techniques in their "material" environment, we were able to distinguish between two styles of practicing the *Yijin jing*, which Hsu and Lim learned in Kunming and Singapore respectively. Lim's movements were directed towards training *jin*, a tangible power central to any martial environment. Qiu's curved and softer movements, on the

¹⁶ On openings and closings, see Hsu (in press).

other hand, are best understood as negotiating the “materiality” of an environment constituted of *qi*.

The “materiality” of *jin* and *qi* was constitutive of both the person and the environment, and hence both *Yijin jing* practices were performed within a “body ecological” framework. The focus on enskilment highlighted the extent to which the organism’s learning process is defined by the environment’s “materiality”: one negotiates *jin4* through rootedness, alignment, and powerful strikes, while *qi* can be enhanced and brought into circulation through supple and graceful movements. The specific movements and postures practitioners enacted, enskilled them into different “materialities” of their environments.

We do not discount the importance of the body political and sociological, but add to existing body political studies an exploration of the phenomenological, technical, and metaphysical dimensions of *Yijin jing* practices and the materiality of the worlds in which they were practiced. To provide a fuller account of the materiality of the environment into which practitioners enskil themselves, an adequate ethnographic method had to be applied. Since we were dealing with intentionalities, with unusual bodily projections into the world, and with ensuing unusual proprioceptive and tactile perceptions, we took recourse to auto-ethnography and “participant experience”. The environmental modality towards which the *Yijin jing* movements were oriented we experienced as *qi* and *jin4* respectively. By actively negotiating these materialities, our understanding of them became an embodied one. Neither *qi* nor *jin4* can be seen, except indirectly, like the ‘wind in the willows’. However, both *qi* and *jin4* are tangible; and both are best dealt with in rhythmic activity, as is breathing.

Acknowledgements

Special thanks go to Dr Michael Stanley-Baker, MPIWG-Berlin, and to Dr Leslie de Vries, EAST Centre, Westminster University, for having us clarify specific points.

References

- Alter, Joseph S. 1992. *The Wrestler's Body: Identity and Ideology in North India*. Berkeley: University of California Press.
- Chen, Nancy. 1995. Urban Spaces and Experiences of Qigong. In *Contemporary China: the Potential for Autonomy and Community in Post-Mao China*. Ed. D. S. Davis. Cambridge: Cambridge University Press.
- _____. 2003. *Breathing Spaces: Qigong, Psychiatry, and Healing in China*. New York: Columbia University Press.
- Chen Yanlin 陳炎林 1943; transl. by Brennan, Paul 2014. 太極拳刀劍棍散手合編 (*Taiji compiled: the boxing, saber, sword, pole and sparring*). <https://brennantranslation.wordpress.com/2014/03/18/taiji-boxing-according-to-chen-yanlin/> Accessed 2 November 2016.
- CHQA, Chinese Health Qigong Association. 2003. *Health-building Qigong: Yijinjing*. Chinese Health Qigong Association.
- Csordas, Thomas J. 1994. *Embodiment and Experience: The Existential Ground of Culture and Self*. Cambridge: Cambridge University Press.
- Despeux, Catherine. 1976. *T'ai-K'iu'an: technique de longue vie, technique de combat*. Paris: Collège de France Institut des hautes études chinoises.
- _____. 1988. *La Moelle du phénix rouge: santé et longue vie dans la Chine du XVI^e siècle*. Paris: G. Trédaniel.
- _____. 1990. *Immortelles de la Chine ancienne: Taoïsme et alchimie féminine*. Puiseux: Pardès.
- _____. 1994. *Taoïsme et corps humain: le xiuzhen tu*. Paris: G. Trédaniel.
- _____. 1997. Le qigong, une expression de la modernité chinoise. In *En suivant la Voie Royale, Melanges en hommage a Leon Vendermeersch*. Eds. J. Gernet and M. Kalinowski, 267–281. Paris: Ecole française d'Extrême-Orient.
- Engelhardt, Ute. 1963. *Theorie und Technik des taiji quan - Chinesischer Faustkampf*. Shorndorf: WBV Biologisch-medizinische Verlags GMBH & Co.
- _____. 1987. *Die Klassische Tradition der Qi-Uebungen (Qigong). Eine Darstellung anhand des Tang-zeitlichen Textes Fu qi jing yi lun von Sima Chengzhen*. Stuttgart: Franz Steiner.
- Farquhar, Judith, and Qicheng Zhang. 2005. Biopolitical Beijing: Pleasure, Sovereignty, and Self-Cultivation in China's Capital. *Cultural Anthropology* 20 (3): 303–327.
- _____. 2012. *Ten Thousand Things: Nurturing Life in Contemporary Beijing*. New York: Zone Books.
- Farquhar, Judith. 2009. The Park Pass: Peopling and Civilizing a New Old Beijing. *Public Culture* 21 (3): 551–576.

- Frank, Adam. 2006. *Taijiquan and the Search for the Little Old Chinese Man: Understanding Identity through Martial Arts*. New York: Palgrave Macmillian.
- Gibson, J. James. (1979). *The Ecological Approach To Visual Perception*. Boston: Houghton Mifflin Company
- Henning, Stanley E. 1999. Academia Encounters the Chinese Martial Arts. *China Review International* 6 (2): 319–332.
- Hsu, Elisabeth. 1999. *The Transmission of Chinese Medicine*. Cambridge, U.K.; New York: Cambridge University Press.
- _____. 2007. The Biocultural in the Cultural: the Five Agents and the Body Ecologic in Chinese Medicine. In *Holistic Anthropology: Emergence and Convergence*. Eds. David Parkin and Stanley J. Ulijaszek, 91–126.
- _____. (in press). The Iconography of Time in Movements (*shi* 勢) of *Yijin jing* 易勁經 Meditation. In *Ed. Vivienne Lo*.
- Hsu, Elisabeth, and Lim, Chee Han. (forthcoming). History In The Body: The Martial Arts and the *Yijin jing*. In Eds. *Michael Stanley-Baker and Peirce Salgueiro*.
- Ingold, Tim. 2000. *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. London: Routledge.
- Kohn, Livia. 2008a. *Chinese Healing Exercises: the Tradition of Daoyin*. Honolulu: University of Hawai'i Press.
- _____. 2008b. *Meditation Works in the Daoist, Buddhist, and Hindu Traditions*. Magdalena, NM: Three Pines Press.
- _____. 2010. *Sitting in Oblivion: The Heart of Daoist Meditation*. Dunedin, Fla: Three Pines Press.
- Kohn, Livia, and Yoshinobu Sakade. 1989. *Taoist Meditation and Longevity Techniques*. Ann Arbor: Center for Chinese Studies University of Michigan.
- Latour, Bruno. 2000. When Things Strike Back: a Possible Contribution of 'Science Studies' to the Social Sciences. *The British Journal of Sociology*, 107–123.
- Leder, Drew. 1990. *The Absent Body*. Chicago, IL: University of Chicago Press
- Merleu-Ponty, Maurice. 1945. *The Phenomenology of Perception*. Trans. Colin Smith. New York: Humanities Press, and London: Routledge & Kegan Paul, 1962.
- Mauss, Marcel. 1935. The Techniques of the Body. *Economy and Society*, 270–288.
- MHA, Ministry of Home Affairs Singapore. 2003. *Repeal of the Martial Arts Instruction Act*. <http://www.parliament.gov.sg/sites/default/files/030018.pdf>. Accessed 4 July 2016.
- Micollier, E. 1999. Control and Release of Emotions in Qigong Health Practices. *China Perspectives*, 24: 22–31.
- Ots, Thomas. 1994. The Silenced Body – The Expressive Leib: On the Dialectic of Mind and Life in Chinese Cathartic Healing. In *Embodiment and Experience: The Existential Ground of Culture and Self*. Ed. T.J. Csordas, 116–138. Cambridge; New York: Cambridge University Press.
- Palmer, David A. 2007. *Qigong Fever: Body, Science, and Utopia in China*. New York: Columbia University Press.
- Pauka, Kirstin. 1998. *Theatre and Martial Arts in West Sumatra: Randai and Silek of the Minangkabau*. Athens, OH: Ohio University Press.
- Ryan, Alexandra. 2002. *Our Only Uniform is the Spirit: Embodiment, Tradition and Spirituality in British Taijiquan*. Lancaster University.
- _____. 2008. Globalisation and The 'Internal Alchemy' in Chinese Martial Arts: The Transmission of Taijiquan to Britain. *East Asian Science, Technology and Society* 2 (4): 525–544.
- Shahar, Meir. 2008. *The Shaolin Monastery: History, Religion, and the Chinese Martial Arts*. Honolulu: University of Hawaii Press.

- Sieler, Roman 2015. *Lethal Spots– Vital Secrets. Medicine and Martial Arts in South India*. Oxford: Oxford University Press.
- Wang Zuyuan 王祖 (ed.) [1882] 1956. *Neigong tushuo* 內功圖說 (*Illustrated Exposition of Internal Techniques*). Beijing: Renmin weisheng chubanshe.
- Yamada, Toshiaki. 1989. Longevity Techniques and the Compilation of the Lingbao wufuxu. In *Taoist Meditation and Longevity Techniques*. Eds. L. Kohn and Y. Sakade, 99–125. Ann Arbor: Center for Chinese Studies University of Michigan.
- Zarrilli, Phillip B. 2000. *When the Body Becomes All Eyes: Paradigms, Discourses and Practices of Power in Kalaripayattu, a South Indian Martial Art*. Delhi: Oxford University Press.

MAX-PLANCK-INSTITUT FÜR WISSENSCHAFTSGESCHICHTE

Max Planck Institute for the History of Science

Preprints since 2013 (a full list can be found at our website)

- 437** Jürgen Renn **Schrödinger and the Genesis of Wave Mechanics**
- 438** Pietro Daniel Omodeo **L'iter europeo del matematico e medico scozzese Duncan Liddel**
- 439** Irina Tupikova & Klaus Geus **The Circumference of the Earth and Ptolemy's World Map**
- 440** Pietro Daniel Omodeo und Jürgen Renn **Das Prinzip Kontingenz in der Naturwissenschaft der Renaissance**
- 441** Horst Kant und Jürgen Renn **Eine utopische Episode – Carl Friedrich von Weizsäcker in den Netzwerken der Max-Planck-Gesellschaft**
- 442** William G. Boltz and Matthias Schemmel **The Language of 'Knowledge' and 'Space' in the Later Mohist Canon** (TOPOI fi Towards a Historical Epistemology of Space)
- 443** Stefano Bordoni **Looking for a Rational Thermodynamics in the late XIX century**
- 444** Sonja Brentjes and Jürgen Renn **The Arabic Transmission of Knowledge on the Balance**
- 445** Horst Nowacki **Archimedes and Ship Design**
- 446** Matthias Schemmel **Elements of a Historical Epistemology of Space** (TOPOI fi Towards a Historical Epistemology of Space)
- 447** Martin Thiering and Wulf Schiefenhövel **Spatial Concepts in Non-Literate Societies: Language and Practice in Eipo and Dene Chipewyan** (TOPOI fi Towards a Historical Epistemology of Space)
- 448** Jürgen Renn **Einstein as a Missionary of Science**
- 449** Hubert Laitko **Der Ambivalenzbegriff in Carl Friedrich von Weizsäckers Starnberger Institutskonzept**
- 450** Stefano Bordoni **When Historiography met Epistemology. Duhem's early philosophy of science in context**
- 451** Renate Wahsner **Tausch – Allgemeines – Ontologie oder Das Auseinanderlegen des Konkreten und seine Aufhebung**
- 452** Jens HÅystrup **Algebra in Cuneiform. Introduction to an Old Babylonian Geometrical Technique**
- 453** Horst Nowacki **Zur Vorgeschichte des Schiffbauversuchswesens**
- 454** Klaus Geus and Mark Geller (eds.) **Esoteric Knowledge in Antiquity** (TOPOI fi Dahlem Seminar for the History of Ancient Sciences Vol. II)
- 455** Carola Sachse **Grundlagenforschung. Zur Historisierung eines wissenschaftspolitischen Ordnungsprinzips am Beispiel der Max-Planck-Gesellschaft (1945–1970)**
- 456** David E. Rowe and Robert Schulmann **General Relativity in the Context of Weimar Culture**
- 457** F. Jamil Ragep **From Tūn to Turun: The Twists and Turns of the Ṭūsī-Couple**
- 458** Pietro Daniel Omodeo **Efemeridi e critica all'astrologia tra filosofia naturale ed etica: La contesa tra Benedetti e Altavilla nel tardo Rinascimento torinese**
- 459** Simone Mammola **Il problema della grandezza della terra e dell'acqua negli scritti di Alessandro Piccolomini, Antonio Berga e G. B. Benedetti e la progressiva dissoluzione della cosmologia delle sfere elementari nel secondo '500**

- 460** Stefano Bordonì **Unexpected Convergence between Science and Philosophy: A debate on determinism in France around 1880**
- 461** Angelo Baracca **Subalternity vs. Hegemony – Cuba’s Unique Way of Overcoming Subalternity through the Development of Science**
- 462** Eric Hounshell & Daniel Midena **“Historicizing Big Data” Conference, MPIWG, October 31 – November 2, 2013** Report
- 463** Dieter Suisky **Emilie Du Châtelet und Leonhard Euler über die Rolle von Hypothesen. Zur nach-Newtonschen Entwicklung der Methodologie**
- 464** Irina Tupikova **Ptolemy’s Circumference of the Earth** (TOPOI fi Towards a Historical Epistemology of Space)
- 465** Irina Tupikova, Matthias Schemmel, Klaus Geus **Travelling along the Silk Road: A new interpretation of Ptolemy’s coordinates**
- 466** Fernando Vidal and Nélia Dias **The Endangerment Sensibility**
- 467** Carl H. Meyer & Günter Schwarz **The Theory of Nuclear Explosives That Heisenberg Did not Present to the German Military**
- 468** William G. Boltz and Matthias Schemmel **Theoretical Reflections on Elementary Actions and Instrumental Practices: The Example of the Mohist Canon** (TOPOI fi Towards a Historical Epistemology of Space)
- 469** Dominic Olariu **The Misfortune of Philippus de Lignamine’s Herbal or New Research Perspectives in Herbal Illustrations From an Iconological Point of View**
- 470** Fidel Castro Díaz-Balart **On the Development of Nuclear Physics in Cuba**
- 471** Manfred D. Laubichler and Jürgen Renn **Extended Evolution**
- 472** John R. R. Christie **Chemistry through the ‘Two Revolutions’: Chemical Glasgow and its Chemical Entrepreneurs, 1760-1860**
- 473** Christoph Lehner, Helge Wendt **Mechanik in der Querelle des Anciens et des Modernes**
- 474** N. Bulatovic, B. Saquet, M. Schlender, D. Wintergrün, F. Sander **Digital Scrapbook – can we enable interlinked and recursive knowledge equilibrium?**
- 475** Dirk Wintergrün, Jürgen Renn, Roberto Lalli, Manfred Laubichler, Matteo Valleriani **Netzwerke als Wissensspeicher**
- 476** Wolfgang Lefèvre **„Das Ende der Naturgeschichte“ neu verhandelt**
- 477** Martin Fechner **Kommunikation von Wissenschaft in der Neuzeit: Vom Labor in die Öffentlichkeit**
- 478** Alexander Blum, Jürgen Renn, Matthias Schemmel **Experience and Representation in Modern Physics: The Reshaping of Space** (TOPOI fi Towards a Historical Epistemology of Space)
- 479** Carola Sachse **Die Max-Planck-Gesellschaft und die Pugwash Conferences on Science and World Affairs (1955–1984)**
- 480** Yvonne Fourès-Bruhat **Existence theorem for certain systems of nonlinear partial differential equations**
- 481** Thomas Morel, Giuditta Parolini, Cesare Pastorino (eds.) **The Making of Useful Knowledge**
- 482** Wolfgang Gebhardt **Erich Kretschmann. The Life of a Theoretical Physicist in Difficult Times**
- 483** Elena Serrano **Spreading the Revolution: Guyton’s Fumigating Machine in Spain. Politics, Technology, and Material Culture (1796–1808)**
- 484** Jenny Bangham, Judith Kaplan (eds.) **Invisibility and Labour in the Human Sciences**
- 485** Dieter Hoffman, Ingo Peschel (eds.) **Man möchte ja zu seinem Fach etwas beitragen**
- 486** Elisabeth Hsu, Chee Han Lim **Enskilment into the Environment: the *Yijin jing* Worlds of *Jin* and *Qi***