

**The Notion of the Machine Heart (*ji xin* 機心)
in the *Zhuangzi*:
The Ethical Relationship Between
Technology and Nature**

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Glossary

I have used the *pinyin* rendering of the Chinese throughout this dissertation except where I directly quote or refer to names and words arising from sources I have cited which use the Wade-Giles system.

<i>Pinyin</i>	Wade-Giles	Chinese character	Meaning
<i>chunbai</i>	<i>ch'un-pai</i>	純白	purity, pure whiteness
<i>de</i>	<i>te</i>	德	power, virtue
<i>ji</i>	<i>chi</i>	機	trigger of a crossbow; what sets things in motion; opportunity; machine.
<i>ji xie</i>	<i>chi-hsieh</i>	機械	mechanical tools
<i>ji xin</i>	<i>chi-hsin</i>	機心	machine heart
<i>qi</i>	<i>ch'i</i>	氣	'energy'
<i>qing</i>	<i>ch'ing</i>	情	true being of things
<i>ren</i>	<i>jen</i>	人	man
<i>shen</i>	<i>shen</i>	神	spirit
<i>sheng</i>	<i>sheng</i>	生	to be born
<i>tian</i>	<i>t'ien</i>	天	heaven
<i>wu wei</i>	<i>wu-wei</i>	無為	actionless action
<i>xie</i>	<i>hsieh</i>	械	'mechanical', 'apparatus'
<i>xin</i>	<i>hsin</i>	心	heart
<i>xue</i>	<i>hsüeh</i>	血	blood
<i>xing</i>	<i>hsing</i>	性	innate nature
<i>yang</i>	<i>yang</i>	陽	yang
<i>yin</i>	<i>yin</i>	陰	yin
<i>zangfu</i>	<i>tsang-fu</i>	臟腑	vital organs
<i>ziran</i>	<i>tzu-jan</i>	自然	spontaneous action

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The Well-Sweep

(Ivanhoe and Van Norden 2001)

Introduction

Tzu-kung [Zigong] ... travelled south to the land of Ch'u. On his way back, he passed through Chin and along the south bank of the Han river. There he saw an old man going to plant his field. He had dug a [diagonal] tunnel to reach the water down in a well. He entered the tunnel clutching a large jug and then came out again to bring water for irrigating his field. It was a hard job which required much effort for a meagre result. Tzu-kung said to the gardener: "There's a tool for this kind of work; in a day you could irrigate a hundred fields. It demands but little effort for a big result. Wouldn't you like to have one?"

The Gardener looked up and squinted at the speaker, saying: "What is it?"

"All you need is some wood with holes drilled in it and then assembled like a machine [a lever] that is heavy on one side, light on the other. By moving it up and down, you can draw up water in a constantly flowing stream. It is called a well-sweep. At these words the gardener turned red with anger and said with a laugh: "I have heard my master say that where there are machines, there will be the problems of machines, and these problems will produce people with hearts like machines. With a heart like a machine in your breast, there will be a lacking in pure whiteness. The gods of life [of the body] will be disturbed and there will no longer be a place there for the Tao to dwell. It is not that I do not know your machine. I would be ashamed to use it!"

When Tzu-kung told this story to Confucius, Confucius said: "That fellow must be one of those who follow the Arts of Sire Chaos!"

Zhuangzi (tr. Schipper, 1994:196)

The story above will form the basis of a broad-ranging discussion in which I will explore the ethical relationship between technology and nature. During the course of this discussion, I will refer at various points to the dialogue that takes place between Zigong and the Gardener. The well-sweep which is the object of their conversation opens up a number of interesting issues about the character of technology. For instance, the difference between machines and tools and the etymological origins of the Chinese word for machinery which is reflected in technologically-averse Daoism.

The Gardener in the *Zhuangzi* forces us to consider the thought (heretical perhaps in his own time as well as today) that the use of technological devices is morally dangerous and can be deeply damaging to personal well-being. This passage from the *Zhuangzi* could be dismissed as the anarchic rantings of a Daoist primitivist - 'Down with technology!' as A.C. Graham puts it (2001:185). Graham goes on to argue that it is a metaphorical rather than a literal objection to technology, alluding more to one's spiritual disposition than an actual criticism of our practical engagement with machines and devices. However valid the metaphorical reading of the Gardener's story, I believe a literal translation and interpretation indicate that, even over two thousand years ago, the author of the *Zhuangzi* was aware of the tension that still exists for us today between technology and nature. I will argue that the *Zhuangzi* traces the source of this tension to a 'certain mind-set' or 'disposition of the Heart' (*xin* 心) that governs our relationship with nature.

Throughout this dissertation I have taken the deliberate step of using the capitalised form 'Heart' to alert the reader that the concept under discussion is not simply the physical organ of Western medicine but a term that carries much broader significance. Wherever I have used the capitalised form 'Heart' it signifies the Chinese word *xin* (心), which, as Chapter One makes clear, has important connotations which the English language concept fails to convey.

This dissertation will explore the sense in which the Chinese notion of Heart is central to our understanding of what it means to be a human being. It will ask what the implications are for our humanity if the Heart itself becomes a machine, such that its primary 'design' is to enslave nature for human ends through ever more sophisticated technology. Scholars such as Szerszynski have already considered one part of this equation in the debate around *Entzauberung* or the disenchantment of nature, according to which theory nature itself has been stripped of its mystique by the rational forces of science manifesting themselves as various technologies that extract nature's resources (2005:4). This

dissertation will argue that the idea of a Machine Heart (*ji xin* 機心), which sees nature simply in terms of its potential for exploitation by technological means, has an important role to play as the complementary correlate of a disenchanted nature.

In the *Zhuangzi* the nature of reality is not so hard and fast. People's elbows can grow into cockerels and birds can turn into fish. The *Zhuangzi*, urges us to stop for one moment and consider the world from a perspective that is not rigidly determined by human desires and classifications. However, a Machine Heart views the world more prosaically. It seeks reassurance about the predictability of the world. It looks for salvation from the finitude of the human condition in the solutions offered by technology, promising the easing of human burdens, the elimination of disease, and the prospect of leisure-filled longevity.

I argue that if we concur with scientific realism that nature can only be understood through scientific laws and considered simply as a useful resource for human beings, this limits human freedom to following an exclusively technological path. From such a perspective, even the Heart becomes reduced to a lump of bio-mechanical flesh that is subject to the same laws of physics as the disenchanted nature that it feeds on. If that is the conclusion, then we must agree with the author of the *Zhuangzi*, who, against the grain of both his own time and of our own, controversially appears to defend the useless and to pity those creatures and entities that give up their lives for human purposes.

I suggest that the *Zhuangzi* points to a different choice. This choice involves acknowledging that ultimately there are many perspectives. The world as seen by science is only one such point of view. If we step outside the scientific paradigm we can begin to see that animate and inanimate beings that constitute nature all possess intrinsic value. The *Zhuangzi* tells us that if we become attuned to our own innate nature (*xing* 性), we are able to connect with the innate nature of all other beings. Such co-being with nature constitutes genuine

freedom for human beings and for the creatures and entities whose world we share.

Summary

In Chapter One, my discussion starts with an appraisal of what the ancient Chinese understood by the human Heart (*xin* 心). It points to the unhelpful avenues that can occur so easily with interpretations that involve ideas concerning mind, emotions, physical organs and the like as they lead us to the limiting dimensions of dualism that depicts human beings in terms of mind and flesh. The concept of Heart epitomizes everything that is the core of humanity, and for each individual encompasses the personality, psychological, physiological and behavioural traits as well as ideas that we more readily associate with it within the emotive sphere. The Heart is the energy-centre that influences the whole person; the life-giving force that can so easily become diverted by thought patterns arising from a thirst for knowledge and classification of the world. The *Zhuangzi* urges the Heart to be stilled in order to find the true knowledge that arises from innate nature (*xing* 性). A central premise of this dissertation is that the Heart should be considered as the personal locus that defines our relationship to nature, whether that relationship is symbiotic and co-operative or anthropocentric and exploitative.

Chapter Two surveys the Gardener's dialogue with Zigong from a variety of contemporary ethical perspectives. It aims to discover whether, from today's point of view where technology has become the hallmark of modern culture, we can find an analysis of the relationship between technology and nature that helps us to understand the Gardener's radical position that those engaged with machinery are bound to develop a 'Machine Heart'.

Chapter Three explores 'machine' part of the Machine Heart (*ji xin* 機心). It discusses the etymology of *ji* (機) in order to fully understand what such a Heart might entail. The discussion focuses on the idea, proposed by Barry Allen that

only certain kinds of machine belong to *dao* technology. I ask whether there can be a *dao* technology, given the strictures in the *Zhuangzi*.

In Chapter Four I turn to Heidegger's analysis of technology as framed in his essay *The Question concerning Technology* to elucidate the technological mindset that corresponds to the *Zhuangzi*'s Machine Heart. Heidegger's premise that we have used technology to work on recalcitrant matter in order to make its hidden essence constantly available for a complex mesh of interrelated human needs may be expressed more coherently and extensively than the ideas contained the *Zhuangzi*'s parable of the Gardener; however, the underlying concerns are the same. Technology disempowers nature; rivers are not allowed to flow according to their natural rhythms; trees are not allowed to reach maturity; and animals must flee from human beings in order to preserve their lives. In a world so harnessed and forced into the various uniform moulds of technology, human beings can no longer share the rhythms of the cosmos, and imperil their innate inner nature that thrives on a non-acquisitive co-being with the natural world.

Chapter Five, the final part of this dissertation, examines how the *Zhuangzi* depicts the emergence of the Machine Heart from the development of language. I argue that the *Zhuangzi*'s polemic against Confucian nominalism is connected to two important strands in the text. Firstly, it relates to the idea that the Heart needs to be stilled, to be starved of external stimuli that result in the constant verbal analysis of the world. Secondly, the *Zhuangzi* associates naming and classifying all entities in the world as a form of harnessing the inner essence or power of the thing. The *Zhuangzi*, as indeed the *Daodejing*, both warn against excessive cutting up of reality through language.

I conclude the dissertation by commenting on *Zhuangzi*'s warning that all perspectives and values are relative. Bearing in mind the imperative that technology places on us to value the useful, the *Zhuangzi* controversially suggests that we may have much to learn by studying the useless.

CHAPTER ONE

The Heart (*xin* 心) of the Matter

Master Keng Sang [Gengsang] said, 'Keep your body in unity, hold on to life, don't become too anxious. Do this for three years and you can achieve the state of which I have spoken.'

Nan Jung Chu [Nanrong Chu] said, 'The eyes are part of the body, I have never considered them to be anything other, but a blind person can't see through his eyes. Ears are a part of the body, I have never considered them to be anything other, but a deaf person can't hear through his ears. The heart is a part of the body, I have never considered it to be anything other, but the madman can't experience feelings with his. The body is also part of the body, but my soul seems separated from it, because I try to find myself, but why can't I find it? Now you say to me, "Keep your body in unity, hold on to life, do not become too anxious." Despite all my attempts to understand your Tao, this goes in one ear and out the other.'

Zhuangzi (tr. Palmer, 2006:201)

Zhuangzi's Gardener is most concerned about the effect on his spiritual and bodily equilibrium if his *xin* (心), or Heart, becomes like a machine. However, this simple paraphrasing of the text points to a fundamental issue behind the discussion that follows. What becomes immediately apparent is that this preliminary discussion of the Heart uses vocabulary that suggests a mind/body dualism that is alien to the Daoist understanding of the person. In the extract above, Nanrong Chu expresses the confusion that can arise when we start to talk about the body as if it were a thing apart from the self; when we cease to remember that it is our life. It is frequently observed that the Chinese did not share our Western understanding of the person as being composed of two separate substances (namely, corporeal matter animated by spiritual matter) but believed that both were different modalities of one substance, namely *qi*. The Heart is of particular importance as the organ of *qi* transformation, and as a site of the concentrated energy that defines the whole person. As Master

Gengsang tells us, we cannot keep the One, that is, remain the unified entity that we are, if we split away the body. Therefore, I argue in this chapter that, for the ancient Chinese, Heart should not be mistaken for a metaphorical concept only tangentially related to corporeal life of the person.

This dualistic reading of *xin* has been compounded by a lack of consistency of translation. Commonly, the term is rendered as ‘heart/mind’, or even just ‘mind’. This chapter discusses the limitations and contradictions that occur in mapping *xin* on to Western terminology, and attempts to draw out a number of characteristics that the ancient Chinese perceived *xin* to possess that differentiate it substantially from Western equivalents.

The head and the Heart

Our question, then, must start with the translation of *xin* into English. This is by no means straightforward as the cultural coordinates behind this elusive Chinese concept are somewhat different from those of the West. Wu Xiaoming brings this point home when he states: ‘...there was no differentiation in the Chinese tradition between an intelligent, theoretical, or rational mind and a sensible, emotional, or irrational heart, as has been the case in Western philosophy’ (2008:537). The Western paradigm depicts emotions as devoid of cogent thought and historically has associated them with the sensuality of the body. Logical thinking, on the other hand, has been considered as the domain of the mind or soul. Descartes truly encapsulated this when he wrote, ‘Thus, because we have no conception of the body as thinking in any way at all, we have reason to believe that every kind of thought present in us belongs to the soul’ (1985:329). Greatly impressed by Harvey’s groundbreaking work of the time that identified the heart’s bio-mechanical role in pumping blood around the body, Descartes suggested that the physical location for the soul might be in the brain, or more precisely as he identified it, the pineal gland, while the ‘passions’ of the body were conducted to the soul or mind via the ‘animal spirits’, minute particles that form the blood. Subsequent medical knowledge in the West has

developed on the basis of empirical evidence that the brain is the organ responsible for a variety of cognitive functions, including biochemical responses which constitute our emotions, while the heart has a purely mechanical action as the pump that maintains blood circulation throughout the body. However, despite Descartes, Western traditional medicine based on Galen's humoral understanding of the person, has continued to inform our cultural heritage which still acknowledges the heart as being the notional seat of the emotions, the source of love and the locus of suffering when the heart is broken.

When it comes to the translation of *xin*, it is often assumed that what the ancient Chinese must have meant to express can be rendered directly by 'mind', encompassing both rational thinking and emotional impulses that we understand as belonging to brain function. For instance, Zhang's discussion of the 'mind-body relationship in traditional Chinese philosophy' awkwardly skips from talking about 'the heart and its supposed functions such as those of a physical heart and brain' (2007:384) to the convenient translation of *xin* as 'mind'. Kjellberg too, opts for the translation: 'With a mechanical mind you cannot preserve your simplicity...' (in Ivanhoe ed., 2005:236) resulting in a distortion of meaning and losing the emotive associations that the word heart automatically conjures up.

'Heart/mind' is an alternative that is adopted to overcome this problem, for instance by Schwartz when he asserts: 'Thus as early as the *Book of Poetry* the heart/mind already seems the centre of all those expressions of the conscious life we attribute to both heart and mind in the West' (1985:185). While this solves one problem it presents another. The double-aspect heart/mind notion overlooks the inherent contradiction posed by the physical location of the heart. Angus Graham's comment that 'Chuang-tzu is also sceptical about the organ with which we think, which, it may be worth repeating, *is not the brain but the heart*' (2001:11) (my italics) draws attention to this contradiction. The scientifically and medically informed language of today would find it incongruous to talk of a thinking heart, let alone concede that thinking could in

any way be traced to the heart's biology. Are we really to take it that in the world of the *Zhuangzi* the physical heart is the place where thinking takes place? For, as Keekok Lee ironically comments, otherwise we must surely assume that the Chinese '...blotted their copybook because, perversely, in addition, they believed that the heart was the seat of thought. This belief discredits them in eyes of modern science.' (2008:123). Interestingly, the ancient Chinese had little to say about the brain itself, other than believing it to be made of the same stuff as marrow, and classifying it as an 'irregular' organ, not to be counted among the five vital organs (Finger, 1994). It was not until the middle of the 16th Century, following the publication in Chinese of the treatise on memory by the Jesuit Matteo Ricci, that the brain with all the functions that we associate with it in the West, began to find a place in Chinese physiology (Gross, 1999:7). This still leaves us with the perplexing question of how we are to interpret the Heart in ancient Chinese thinking and whether its physical location has any bearing on the discussion at hand.

The Heart in ancient Chinese medicine

If we turn to traditional Chinese medicine, *The Yellow Emperor's Classic of Internal Medicine (Huangdi Neijing)* tells us that the Heart is considered to be the ruling organ where the spirit (*shen* 神) resides and which contains blood (*xue* 血) (Finger, 1994:12). This most important of ancient texts for the Chinese medical tradition outlines the doctrine of *zangfu* whereby the five vital organs, heart, lungs, liver, spleen and kidneys are held responsible for balance and well-being. *Zangfu* is based on a system of correspondence between these organs and the five phases that constitute all living things. According to the doctrine, the element that is associated with the Heart is fire, a symbol that reinforces the idea of the Heart as a powerful energy centre that is the source of life. Some schools of traditional Chinese medicine argue that the five organs correspond only notionally to the physical organs identified by Western medicine and should be understood metaphorically as an energetic system based on philosophical principles. This allows authorities on the subject, such as Liu Zhanwen, to

skilfully override the problem of the physical location of 'mind,' as the following paragraph suggests:

In the theory of visceral manifestation the physiological function and pathological changes of the brain are ascribed to the heart, since the heart is the chief of the *zang* organs. The emotions are further assigned severally to the five *zang* organs, thus, the heart houses the mind and controls joy; the lung houses the soul and controls grief; the spleen houses intention and controls brooding; the liver houses the ethereal soul and controls rage; and the kidney houses will and controls fear.

(Liu Zhanwen, 2009)

This would suggest that the Heart has a theoretical - and to Western thinking, empirically unproven - role in terms of health maintenance and should be understood more as metaphorical concept rather than the actual physiological organ of thought and emotion. Hence the argument that Heart should equate to mind and in medical reality should be located in the brain, dismissing any talk about it as the actual physical organ itself.

A possible further argument for supporting the case that the Heart would be only a metaphor for the ancient Chinese is the claim that Chinese knowledge of anatomy was limited as their medical approach developed from a completely different kind of observational base, one that noted external influences on health and well-being, such as the effect of weather and seasons, in contrast with the Western medical tradition from the time of the Enlightenment which examined the effects of disease on the body, focusing ever more closely on examining the physical structure of internal organs. Actual dissections in ancient China were rare as the veneration of ancestors forbade the cutting open the human body (Finger, 1994:12). No dissections were documented until 16 CE when the emperor Wang Mang (c. 45 BCE - 23 CE) ordered a rebel to be dissected in order to measure the internal organs and identify the location of blood vessels (Schnorrenberger, 2008:37).

The character of the Heart

If, however, we trace the development of the Chinese character of *xin* (心) from its ancient pictogram to the modern day rendering, it is clear that the ancient Chinese thought of the Heart not only metaphorically (as we interpret it) as a medical concept based on an energetic understanding of human body, but also as an actual physical organ, as can be seen in the figure below:



(Lee, 2008:122)

The stylised modern version of the character clearly retains the pertinent features of the figurative pictogram. The second pictogram from the left, appearing on oracle bones (*jiaguwen* 甲骨文), suggests a degree of anatomical familiarity with the Heart's four cavities that most likely arose from divination practices and regular encounters with war wounds during China's turbulent ancient history (Lee, 2008:122). Returning to the *Huangdi Neijing*, the text demonstrates that the physiological relationship between the Heart and the rest of the body was well understood, when it states for instance, that a healthy Heart may be diagnosed from a strong pulse and a rosy complexion (Veith, 2002:173). The purely physiological picture, however, was considered as identical with the dynamic action of the Heart: 'When the liver receives the life-giving force from the heart, it is from there transmitted to the spleen, whence it is passed on to the kidneys; here it reaches its utmost, so that it meets death when it arrives at the lungs' (2002:179). This reinforces the argument for the central importance of the Heart as directly responsible for the proper physical functioning of all other organs as well as an energetic centre that generates all vital signs of life in the individual. Certainly the passage in question in the *Zhuangzi* takes it that the Heart, with all its thinking and feeling functions, is located just where we would expect it be: in the chest.

The Heart as 'field of force'

Thinking and feeling are important but not the only characteristics of the Heart. A person's physical appearance and demeanour were thought to be determined by *xin* as suggested by Mark Elvin when he asserts that:

The corporeal attributes may be the expression of the heart-mind or *xin*, a concept that can be interpreted as the psychological field of force that is attempting to control the body, and which reveals itself in physical structure and posture, or they may be more superficial properties like beauty in the sense of "prettiness." The sartorial attributes are clothes, and items like clothes, such as auras. They basically express social and, to some extent, moral status.

(1989:267)

Elvin's compact analysis at first sight suggests another variation on the familiar dualism already under discussion, one in which our Western training attributes psychological impulses to the brain, and apparently continues the supposed mix up between Heart and brain by the ancient Chinese. However, a dualistic reading would miss out on the important statement he makes when he calls *xin* a 'field of force'. On my interpretation, this should not be considered as something separate from the body that is morphing it into a specific shape, but as an energy centre arising in the physical Heart whose influence extends well beyond the limit of the Heart's boundaries. The idea of a magnet placed under a sheet of paper that is able to determine the shape of iron filings scattered on the surface of the paper would be an appropriate comparison. This presents *xin* in a new light, as a powerful impetus that is able to determine one's physical attributes and the way one presents oneself to others. In this way the Heart may be seen as being extremely sensitive to social, environmental or moral influences, whose effects are expressed in malleable physical traits such as posture and physiognomy, conveying both passing and more fixed emotional states. The Heart, then, is the organ of physical transformation, defining each particular individual. Its sphere of influence, the 'psychological field of force' reverberates through the individual and meshes intimately with the world it

touches, literally through the touch of flesh on the world and through the exploration of meaning and emotion conveyed by the touch.

However, biological factors such as bodily impairments from birth or from disease, may result in certain physical characteristics that should not be assumed to arise from the psychological, or indeed, moral condition of the Heart. This was a source of controversy in traditional Chinese thinking, as in other ancient cultures such as our own Judeo-Christian heritage, since a causal connection was often made between illness, physical defects and the impairment of the individual's spiritual state. For example, the *Zhuangzi* shows Confucius's prejudice against Choptoes who suffered punishment by mutilation for his misdemeanours (Graham, 2001:78). Confucius, in this and other examples, assumes that spiritual power, which comes from the *dao*, and hence the moral quality of the individual, is adversely affected if body shape is damaged, either from birth, by accident, or deliberately by mutilation, as the *dao* cannot flow naturally and perfectly through an imperfect vessel. However, the *Zhuangzi* takes issue with such a reductive method of judging the character and moral worth of a person. For instance, Ugly-face attracts women who want to be his concubines, Cripple-Lipless commands the respect of the Duke Ling of Wei and Pitcher-neck with the goiter is likewise highly respected by Duke Huan of Qi (Graham, 2001:80). They are so appreciated that others who lack their physical characteristics are considered to be the ones who are deformed. Although these examples cannot claim to illustrate that the *Zhuangzi* was, anachronistically, against a modern day style of dualism, they do suggest that he viewed morality in terms of relative human judgements, rather than as spiritual force that could directly result in physical imperfection.

The Heart of profound pain

Other ancient Chinese sources can also help to flesh out how the Heart was understood. For Mengzi the Heart's ability to empathise with others argued for it being the essence of humanity. Mengzi tells us that among the four features

that characterise the Heart (the 'heart of compassion', the 'heart of shame', the 'heart of respect' and the 'heart of right or wrong') it is the heart of compassion, or as Wu claims for its literal translation, 'the heart of profound pain' which is the most dominant (2008: 573). It is an extraordinary feature of the Heart that among the many outside influences that it assimilates, it is the pain of others which it can experience most vividly. We can perhaps relate most readily to this idea through the Western Christian notion of the wounded heart of Jesus, which is capable of viscerally experiencing the pain of others. This ability may reinforce Elvin's holistic 'field of force' idea more strongly than anything else, as when we experience the pain of others, we too will be moved physically, not just in the expressions wrought on the face, the posture and the gesture by our emotions, but notably, in our actions. This Heart of profound pain leads us to behave spontaneously in the interests of another. Wu cites the examples of the king who cannot bear the suffering of the sacrificial ox and the person who sees a child about to fall into a well. This impulse is the most human characteristic of all. As Wu puts it, 'the heart of compassion signifies the humanity of the human' (2008: 574). The Heart that responds to the interests of another is also the Heart that reaches out beyond the world of humans to the natural world of animate and inanimate beings, recognising the imperilment of the interests of another. It is the Heart that intuitively 'knows' the state of another's Heart, sensing the Heart of the natural world, as it is itself part of nature.

The thinking Heart

With the Heart as the life-centre for the whole person, there is no inherent contradiction involved in talking about the Heart's capacity for thinking for we are no longer in the realm of reductive medical science. Therefore when the *Zhuangzi* discusses some of the pejorative effects of thinking on the body it should not be thought that he is making a claim for the body as a separate substance. There are many such examples that echo the words of the *Zhuangzi's* Gardener when he says, 'With a heart like a machine in your breast, there will be a lacking in pure whiteness. The gods of life [of the body] will be disturbed and

there will no longer be a place there for the Tao to dwell'. In a similar vein, for instance, Nanrong Chu dolefully says, 'If I am full of knowledge, I injure my body' (Schipper, 1993:199) and of the man who does not let emotions have an effect on him Zhuangzi (the character) says: 'The Way gives him a face and Heaven provides a shape. He does not allow either the good or the bad to have any effect on him. But you now, you wear your soul upon your sleeve, exhausting energy, propping yourself up on a tree, mumbling, or bent over your desk, asleep. Heaven gives you form, and you wear it out with pointless argument!' (Palmer, 2006:45).

All of these examples point to the importance of the Heart/body dynamic in the *Zhuangzi*, as it is an organ of such sensitivity that all experiences and interactions with the world are consumed by its energetic centre and are transformed as thought energy that reverberates throughout the body. The idea that constant thinking (characterised in more modern times as thought patterns underlying anxiety and stress) has damaging effects on our health is common to many religious and philosophical approaches that advocate meditation practices where the aim is to eliminate thoughts and create a mental void, resulting in a state of complete physical relaxation. In Daoist belief, the body is commonly depicted as a landscape, complete with buildings and palaces where different gods resided. These gods were the interface between human beings (*ren* 人) and Heaven (*tian* 天), serving to maintain a microcosmic/macrocosmic balance. If someone was in a state of agitation, or constantly preoccupied with worldly affairs, this would be reflected in their energetic make-up with consequences for the physical body, whose ability to function naturally would become impaired. It is because the Heart has a variety of modes, including influencing the physical functions of the body by enabling the flow of energy (*qi*) through the other organs, that the quality of that energy will be affected by its consecutive mode which involves thinking, having a potentially detrimental effect on the entire person.

The practice that the *Zhuangzi* advocates in order to avoid damaging the body is the 'fast of the Heart', a practice that involves more than bodily privations: "Concentrate with your will. Do not listen with your ears, but with your heart. Do not listen with your heart, but with your ch'i ...the ch'i are 'empty' and thus responsive to all beings. The Tao is found in that 'void' and that 'void' is the 'fast of the heart'" (Graham, 2001, 1996: 68). In order to allow the Heart to fast, all outside stimuli must be shut off to prevent constant questioning and thought. This state of inner quietness induces the ability to become one with the *dao*, allowing a completely natural state of being to set in, the state of being that we are born with, according to the *Zhuangzi* when it states: 'Can you be like as a child, a newborn who moves without knowing what it does, who moves without knowing where it goes? Its body is like dried out wood, its heart like dead ashes.' (Schipper 1994: 199) When we achieve this state, according to the *Zhuangzi*, we return to our innate nature (*xing* 性) which mirrors the innate nature of all entities. It is this state that allows the artisan such perfect engagement with his medium. For the sword maker it is the sword; for the butcher it is the ox, and for the swimmer it is the river. The distinction between human beings as subject and the rest of the world as object disappears as all are unified in a state of wordless knowing. In this state of inner attentiveness the heart loses its physical properties, as it is reduced to *qi* (氣), the base form of all cosmic matter which it shares with all entities (Zhang, 2007: 387).

There are several examples that illustrate this process. In one little cameo from the *Zhuangzi*, Old Tan has just emerged from his ablutions, his wet hair streaming down his back, and is standing outside in the fresh air letting the wind dry his hair. He is so lost in a trance, that Confucius, who has come to visit him, says that his body is like 'withered wood'. His Heart, that is roaming at the 'beginning of things', is constrained so that he is totally unable to speak (Graham 2001:130). In another example, Nanguo Ziqi is lying on his couch, breathing deeply and lost in meditation. His friend, Yancheng Ziyou looks at him in astonishment and says: 'Can the frame really be made to look like withered

wood, the heart dead like dead ashes?’ (2001:48) These examples reinforce the importance of the Heart co-incidentally being physical organ as well as the energy centre of the person. The fasting the Heart slows the pulse, in the case of meditation, reducing bodily functions to a bare minimum, and in the case of the artisans, allowing the pure flow of unconscious movement.

Chapter conclusion

In the *Zhuangzi* the Heart was conceived as the physiological powerhouse that enabled either spiritual transcendence or moral decline through its direct interface with all aspects of Heaven and Earth. The *Zhuangzi*'s Gardener may be primarily concerned with the potential loss of his own spiritual equilibrium, but as the Primal Man of Chaos (Palmer, 2006) he is cosmologically entwined with the natural environment at a stage before it becomes differentiated into the myriad things. By shunning the world of technology, he attempts to maintain the purity and whiteness (*chunbai* 純白) that is the innate state of all human beings, where the Heart remains uncomplicated by knowledge that pertains to the world and becomes a truly knowing Heart that is at one with the *dao* and all nature. Such knowledge remains not only unspoken, but is incapable of articulation.

From this discussion, the picture of the Heart that emerges, is that in a microcosmic sense, it encapsulates the entire person. Rather than being thought of as a specific organ, I suggest that it should be seen as the source of the life-energy of a person that is the very core of their being. This core is a vital dynamic thing that encompasses many modes of being. Some of these relate to health, well-being and the proper functioning of the body; some to the character, attitude and demeanour of the person; while others relate more to the internal world of the Heart such as moral judgement, emotions and thinking. In all of its modes, the Heart's effects on the body mesh as one vital organism.

From this exploration of the Heart we can begin to understand the far-reaching significance of the Gardener's assertion that engagement with machines will produce problems and 'these problems will produce people with hearts like machines'. In what sense can we understand what it means to have such a Heart? As the Heart reaches out to the world that surrounds us, what becomes of its essential qualities if that world is one that is based on calculated gain and a purely scientific perception of nature? The next chapter surveys current ethical positions with regard to technology in order to gauge whether we have sufficiently sensitive models to understand how the Heart can be so fundamentally altered as to become a machine.

CHAPTER TWO

Watering the Garden: What is Wrong with Technology?

It is not that I do not know your machine.
I would be ashamed to use it!

Zhuangzi (tr. Schipper, 1994:196)

Zigong's question embodies an innocent assumption which underlies a common approach to technology: surely it is a good thing to relieve the human body from performing repetitive and exhausting work and use our inventive abilities to create tools and machines to carry out such tasks? Certainly the dominant worldview today expresses a similar sentiment. The technologically adept West provides a model to which developing countries aspire, both for humanitarian reasons in order to eradicate disease and poverty, or for sheer economic gain as only those players able to wield technological solutions can compete in world markets. Bar apocalyptic disaster, there is no turning back the clock to a pre-technological society. So why should we not wholeheartedly embrace the technological world we live in with full confidence that we now have the scientific knowledge and technological sophistication to manage any issues pertaining to both our local and global environment?

This chapter will examine a number of ethical perspectives with regard to technology and will trace how the values that underpin technology impact directly on how we perceive nature and behave towards it. The passage from the *Zhuangzi* contains two opposing views. Zigong's naive optimism endows technology with a soteriological goal and places great faith in human knowledge and inventiveness. In sharp contrast, the Gardener's moral condemnation is harder to define insofar as it may fit any number of ethical positions with regard to technology that are very much part of our contemporary environmental debate.

The value-neutral view

According to the *Stanford Encyclopedia of Philosophy*, 'Technology approaches and systematizes the solution of practical problems' (Franssen, 2009:6) and suggests that the discipline most closely associated with it is engineering. The term technology is used generically to describe the practical and ingenious solutions we have invented on the back of the scientific knowledge which so permeates contemporary culture. We tend to use the word as indicating a set of diverse capabilities, along the lines defined by Jacques Ellul: 'Technique is the totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity' (1973).

In Western Europe the rise of technology is associated with the development of machines that took piecework from the hands of individuals to mass scale production by machines during the Industrial Revolution. Hand-produced craftwork relies heavily on the knowledge and expertise of an individual craftsman, and gives no guarantee of the consistency and uniformity of the end product. According to Szerszynski (2009:35), crafts in this respect have historically been considered inferior (rightly or wrongly) to technological production as the outcome is often uncertain and unpredictable. The chief characteristics of technological equipment or machines in general are the elements that can guarantee a blueprint for consistent production and replication. These elements consist of: accurate measuring tools and systems; well defined and commonly agreed processes; clearly set out functions and set purpose; efficiency; durability; constancy, and so forth. Technological solutions must ensure a standard product from which all human, fallible elements have been removed.

Thus far, technology appears in a fairly neutral light with regard to ethics. It is based on objective scientific knowledge which gives us a clear understanding of how nature works. It has enabled us to develop the equipment we need for the

most efficient extraction of nature's resources, for controlling nature's powerful forces and for solving our small and large scale problems.

The value-neutral view prevents any scrutiny of technology as a fundamental mode of human behaviour as the moral dimension applies only to questioning specific instances of how technology is used. The 'value-neutral' view asks that we only examine the uses to which technology is put and regulate them according to the moral frameworks that govern society at any given time. If we claim that technology *per se* is value-neutral it remains unassailable, as no moral dictum can be attached to it. This standpoint arises from a more fundamental idea that knowledge itself is value neutral, an issue which the *Zhuangzi* challenges. If we apply the value-neutral view to the example of the Gardener, we might duly conclude that his angry response to Zigong's suggestion is unwarranted, as using a machine is hardly going to harm his spiritual well-being.

The normative view

Willem Drees (2009:12) emphasises the extent to which we are part of a culture which is built on supreme confidence in the powers of technology whose visible manifestation in the form of now largely electronic devices belies the hidden depths of the technological infrastructure that supports society. He points to the extent to which technology determines social organisation, education, medicine and the skills required for the world of work as well as home-life and entertainment. Technology is hardwired into the structure of society as well as our psychology, arising, he suggests, from a problem-solving attitude being at the core of human ways of thinking.

In ethical terms technology is most commonly thought as having normative value. The dominant assumption in both the time of the *Zhuangzi* and our own is that technology is there for the betterment of humanity. Unlike science that tells us how things are, technology tells us how things ought to be in order to improve human (or animal or environmental) conditions (Franssen, 2009:7).

Under this view it is qualitatively opposed to 'nature' or the way things naturally occur. This, by contrast is depicted as chaotic, unpredictable and destructive. Although the use of technological solutions may have some unwanted consequences for the environment, under the normative view our technological culture is evidence of the progressive development of human society. Improved methods for medical diagnosis or instantaneous means of communication are all seen as examples of steps towards a better, if not utopian, society where ills and inconveniences will largely be eradicated.

Bringing the discussion back to the *Zhuangzi*, we should put aside the prejudice that views the distant past as a foreign – not to mention primitive – country, and note the extent to which technology had already permeated Chinese society in the 4th century BCE. Although the earliest extant depiction of a well-sweep only occurs in the middle of the 2nd century CE in the tomb reliefs of Xiaotang Shan and Su Liang (Needham, 1978:225), we can assume from Zigong's comments that even some 600 years earlier when the *Zhuangzi* was arguably written, it would not be considered an uncommon sight. This would make the Gardener's method of watering the garden more the exception to be marvelled at than the rule. In the light of the apparent general familiarity with the well-sweep, we can understand how the Gardener's comment that 'A person who has machine tools is invariably involved in machine affairs' would suggest that the use of such a machine has far-reaching implications beyond those of a labour saving device. A machine needs maintenance and regular attention. It becomes woven into the fabric of one's life which becomes dependent on it. Certainly during later periods of Chinese history, the manipulation of waterways and irrigation techniques led to technological lock-in with agriculture and local economies being completely dependent on the resource of water (Elvin, 2004:123). The Gardener may well be expressing an important concern, based on contemporary observations, that the survival of communities at the time was entirely dependent on the effective functioning of such early examples of water engineering.

This view has implications for the Gardener in the *Zhuangzi*. His rejection of a technological solution could be seen in a very negative light. Perhaps he is an ignorant peasant, living in primitive conditions, with a superstitious fear of modern advances. Or, perhaps he is an intellectual idealist living out a fantasy world of being at one with nature, where in reality his body will be worn out by the physical exhaustion of labour. Or, more seriously, he is living on the fringes of society and potentially poses a threat to the established order by rejecting its norms and values, and is therefore morally suspect: a hippy or a Daoist anarchist! The normative view forces us to think of technology in positive terms, and side-lines those who think otherwise. It fails to question the ethical dimension of how technology relates to nature and leaves us unenlightened as to why the Gardener objects so strongly to the use of the well-sweep.

The religious view

The positive view of technology described above is represented by Zigong. Its ethos can be condensed into one simple formula: technology has the potential to save humankind from toil, premature sickness and death. It is not pushing the point too far to argue that Zigong sees technology in almost religious terms as the purveyor of utmost efficiency and, therefore, the saviour of humankind. This narrative is one that is recognised as a feature of the modern world by Bronislaw Szerszynski. He traces the historical development of *techne* from its raw craft form into its higher status in the Western Protestant world. In describing this trend he writes, 'As 'technology', the practical arts were given a religious, soteriological function, as promising liberation from finitude and necessity by bringing the certainty of reason itself into humanity's dealings with nature' (2005: xiv).

The soteriological view of technology described by Szerszynski is linked to the thesis that technology has taken on certain religious traits. Nature, by contrast, has lost the sacred character attributed to it by pre-modern societies. The

concept of *Entzauberung* which both Szerszynski (2009) and Miller (in Drees: 2009) have adapted from Max Weber's original idea (1919), claims that the disenchantment of nature has been caused notably by the dominance of scientific realism which deconstructs all natural phenomena into sets of scientific rules.

The idea of a disenchanted nature carries moral overtones, which can be read in two completely different ways. On the one hand, it might be a favourable state of affairs. The rational power of science has held sway and swept away 'superstition' and ignorance in a bright new age where technology provides solutions to combat nature's weaknesses, and harnesses nature's energies in hitherto undreamt of ways. On the other hand, the disenchantment of nature might represent science in a negative light. This view claims that striving to attain scientific knowledge is responsible for our loss of innocence; the fall from paradise into a world that holds no mystery as science disabuses the human race of any notion of the sacred. Both Szerszynski and Miller appear to avoid the ethical discussion by arguing that the subjugation of nature to technological control does not entail the hard and fast conclusion that nature has in fact become disenchanted, nor the sacred lost to a secular, technological society. Rather, in a somewhat Darwinian reading, they argue that, historically, the sacred is the primary state of affairs, and as such it has now surfaced at the heart of science and technology. While we embrace the knowledge of nature that science has given us, in certain aspects of our dealings with nature we retain the language of mystery as if the sacred has emerged for us in a new form. Until this is recognised, they argue, political and ethical debates about the role of religion in science and technology will remain fruitless. Technology, arguably a manifestation of a secular society, is imbued, according to Szerszynski, with characteristics that define the sacred.

The Machine Heart, we can now begin to understand, is a perspective on the world that has already started to embrace scientific realism and creates a corresponding reality through the creation of nature-controlling technologies.

The first assumption of the Machine Heart is that it is the right of human beings to extract the power resources of nature, while nature itself is accorded no intrinsic rights.

The monster in the machine: unrestrained technology

Just as there are those who might side with Zigong's astonishment at the Gardener's disdain for technology, there are those who for a whole variety of different reasons would have a great deal of sympathy with the Gardener's position. 'The present environmental crisis is seen to be a result of a dominant modern worldview delineating assumptions about reality that are anthropocentric, materialist, economic and technology-based, separating humanity from and devaluing nature' proclaims Watling (in Drees, 2009: 92). A prominent voice in the environmentalist camp cites worst case scenarios, such as the BP deep-water oil disaster in the Gulf of Mexico, as examples of overconfidence in technologies, leading inevitably to super-scale disasters. A milder variation of the critical view echoes concerns expressed by writers such as Ellul (1973) who bemoan the addictive effect of technology on society. There is the suggestion that such reliance on technology for every aspect of running our lives disempowers us insofar as we lose the most basic self-care skills. Ellul writes: 'The reality is that man no longer has any means with which to subjugate technique, which is not an intellectual, or even, as some would have it, a spiritual phenomenon. It is above all, a sociological phenomenon; and in order to cure or change it, one would have to oppose to it checks and barriers of a sociological character' (1973:306).

These critical views of technology claim that it is out of control, no longer kept in hand by engineers and technicians who engender it. Frankenstein can no longer control his monster. These arguments contain a popular polemic against technology, anthropomorphised into a demonic force, or, to use Ellul's language, a societal disease that requires 'curing'. Looking under the surface of the polemic language, there is some serious attempt at analysis. The suggestion

is that technology is invested with an autonomous existence. It has become a life-force in its own right that is nourished by the promise of endowing its controllers with political power and the ultimate reward of financial gain. Under this view, the ethics of the situation are undermined by human greed and capitalist belief in market forces which have unleashed the monster of technology.

Technological fakery

A less provocative critique of technology claims that it removes us from an authentic experience of nature (Gruen in Jamieson, 2001:444). The authentic/spiritual environmental ethic is endorsed by Deutsch (in Callicott and Ames, 1989:259) who affirms that, 'By "natural reverence" I mean the awareness of the belonging together of man and nature in freedom – in such a way that allows for a meaningful, creative play in that relationship.' Thoreau, whose influence on the American naturalism that is so much part of modern day appropriation of Daoism, expresses this sentiment when he says: 'Ancient mythology and poetry suggest, at least, that husbandry was once a sacred art; but it is pursued with irreverent haste and heedlessness by us, our object being to have large farms and large crops merely' (2004). The response of the Gardener in the *Zhuangzi* can be readily interpreted in this light. His relationship with the earth and his hands-on cultivation of plants could amount to a life dedicated to an authentic experiencing of nature. The Gardener's labour intensive work is wholesome, full of integrity, perhaps verging on the holy. Here, the authentic takes on a spiritual dimension, something that is readily suggested by the Daoist context of the *Zhuangzi*. The Gardener is in tune with the *dao*, and his actions reflect a supremely desirable state of affairs.

Chapter conclusion

These contemporary views of technology indicate the extent to which it has become the kind of creeping condition against which the Gardener in the *Zhuangzi* warns. Technology has become embedded in our culture to such an

extent that we can hardly see where its origins lie. For the Gardener it starts with the relatively innocent use of such simple technology as a pole, a lever and a bucket. A condition enters the human Heart which begins to change our outlook on the whole world. Even voices which today express caution about the use of technology do not address the central issue which is the attitude that comes to permeate the human Heart and transforms nature into a calculated resource for human beings.

In summary, there is little in the environmental ethics debates of today that can readily explain to us why the Gardener in the *Zhuangzi* should choose, as a matter of principle, to make such heavy weather of watering his garden by hand. It is perhaps because our contemporary views of technology fail to identify the dynamic behind this cultural phenomenon that we are unable to gauge quite how it affects our relationship with nature. The next chapter will examine the 'machine' element of the Machine Heart to see how it relates to the fundamental precepts of Daoism.

CHAPTER THREE

Technology as *Ji* (機): the Trigger that sets Things into Motion

‘Oh ho!’ said Hung Mung [Hong Meng]. ‘Strengthen your heart. Remain sure in actionless action, and all things will transform themselves. Reject your body, throw out hearing and eyesight, forget that you are anyone, become one with the Vast and the Void. Loosen the heart, free the spirit, be calm as if without a soul. All living things return to their root, not knowing why. Constantly in darkness, constantly in darkness, and throughout their physical existence they never depart from this. Ask not its name, seek not its shape. So all life comes to birth through itself.’

Zhuangzi (tr. Palmer, 2006:88)

How to translate ji (機)?

The Gardener warns that: ‘... where there are machines, there will be the problems of machines, and these problems will produce people with hearts like machines. With a heart like a machine in your breast, there will be a lacking in pure whiteness [*chunbai* 純白]’ (Schipper, 1993:196). The Gardener’s words in the *Zhuangzi* seem to elicit an uncomfortable response from modern translators. With a few notable exceptions, who are content to use ‘machine’ to translate the character *ji* (機), most employ somewhat evasive tactics and shy away from any translation that might suggest that it is technology *per se* that is under attack. Mair, for instance, renders the Gardener’s closing remarks thus: ‘Where there are ingenious contraptions there are sure to be ingenious affairs (*you ji xin zhe bi you ji shi* 有機械者必有機事)’ (Mair, 1994). Graham (2001), who is generally keen to bring out the philosophical nuances of the *Zhuangzi*, gives us the rather clumsy, ‘Whoever has contrivances with tricks to make them go is sure to have activities with tricks to make them go’ (2001:186). Needham translates *ji* as ‘cunning devices’ (1956:124). Although these English language

versions of the text are certainly carefully considered, and, on first sight may seem quite innocuous, the additional use in each instance of the qualifying adjective sets a pejorative tone that seeks to avoid any suggestion that it is stereotyping technology in general. The idea conveyed by these translations is that the Gardener is objecting to a particular aspect of technology, or of human inventiveness that is characterised by being just too clever, too premeditated, and too intent on achieving results at any cost. The implication is that technology in general is not the target of the Gardener's strictures. The sarcastic tone of the Gardener's language is undeniable. But how can his objection to the simplest of technology – no more than a lever on a stick – be explained? The previous chapter explored contemporary, popular conceptions of technology in the hope of finding an interpretation of the Gardener's standpoint that would make sense to us today. Such an analysis was found lacking. This chapter seeks to examine the proposition that for the Gardener only certain kinds of technology present a moral danger. It will explore the validity or otherwise of the implicit argument that there could be a form of technology that is specifically Daoist in the way it relates to nature.

The article by Barry Allen, *The Dao of Technology* (2010), takes up the theme suggested by the translations above, and offers one of the few in-depth critiques available of the Gardener story. Allen's thesis makes a number of related points. Firstly, he poses a question that echoes Needham's analysis of the passage (1956:124) namely, in whose interest is it to irrigate such a large number of fields as proposed by Zigong? He hints that the Gardener's Daoist politics would make him averse to supporting the feudal power of the lords who bear ultimate responsibility for introducing irrigation technology into the peasant agricultural economy. *Why would* the Gardener want to use a well-sweep, he asks. This argument is certainly in keeping with the Daoist attitude to authority. However, Allen's real interest in the story is not to trace the socio-political history of technology in ancient China. The point which is key to Allen's argument is that in Daoism only certain examples of technology are seen as wrong as they interfere with the way things naturally are.

Allen discusses the etymology of *ji xie* (機械) to support his interpretation that the Gardener does not have a wholesale objection to technology, only to certain manifestations of it. He claims the two words used in conjunction give a special emphasis to the Gardener's meaning, suggesting something along the lines of 'mechanical machines', or, as he goes on to qualify it, 'machinish machines'. Their particularly clever action, Allen states, is to be contrasted with *xie* (械), tools in general which are viewed favourably throughout the *Zhuangzi* in its many examples of skilled artisans and the like who employ tools effortlessly.

Ji xie has a literal translation as 'machine tools' (Unger, 2000: 44). Joachim Kurtz devotes a useful paragraph to explaining the origin of *ji* (2001). In ancient Chinese, the word denoted the trigger on a crossbow, with the associated meanings of its controlling function and its ability to set something into motion as well as that which 'controls the beginning'. Although the word also has the sense of 'skilful' or 'clever', it has a very specific sense, which he describes as follows: '... *ji* is used as a general allusion to moving mechanisms and parts, including skilfully manufactured devices, in particular transmission mechanisms assembled from many individual parts. All of these have a controlling, transmitting or driving function, and reflect the ingenious contraptions of their designers and are beneficial to their users' (2001:180). *Xie* is the general word for utensils, implements and mechanised appliances of any kind (2001:183). The combined use of both words in the context of the Gardener passage is claimed by Kurtz to denote the ingenious aspect of the machine, but he also stresses that: '... it is used to designate the basic components of the swape [well-sweep] – *xie* and its particular features, such as the lever. It is the *ji* that enable the *xie* to "accomplish much with little effort"' (2001:188).

Following Kurtz, I argue that the primary meaning of the words used by the Gardener are descriptive - the well-sweep has a *ji* part (the lever) and *xie* part (the bucket), and it is not the Gardener's intention to single out a particular

category of technology in the manner suggested by Allen. On the contrary, I claim that he objects to all technological devices. The Gardener arguably implies that that using the well-sweep may seem innocent enough in isolation, but dependence on technology soon becomes a creeping condition. It is a syndrome that starts with one individual and soon becomes endemic throughout a society and a culture. The warning tone of the Gardener's words may be deduced from the negative meanings associated with the Chinese words *ji xie*.

Unsurprisingly, given that China's warring history produced sophisticated military technology, both *ji* and *xie* share a military origin, with *xie* often referring in ancient texts to weapons (Kurtz, 2001: 183). The origin of these two key terms in warfare emphasises the *yang* aspect of technology mentioned above, suggesting an underlying ruthlessness to technological exploitation, whose ultimate aim is frequently the giving up of the resource or life of its target for human consumption. This is further reinforced by the idea of the crossbow aiming at its target. Allen says that machines 'reek of intentionality' (2010:152). This is an important point as it is an inherent property of any given piece of equipment that it should achieve a clearly defined aim. It cannot afford to miss its mark or else it becomes redundant. Such precise purposiveness is the mark of all technology, not just selected examples.

Some other meanings of *ji* offer interesting insights. 'That which controls the beginning' (Kurtz, 2001) is an appropriate definition of machinery, for example where a winding-cog produces results well beyond the scope of the initial action. *Ji*, with its associated idea of the trigger, tantalisingly suggests the notion of movement which is so pertinent to machinery and to any technological society. Once the trigger has been released what results is motion, and, in the case of machinery, perpetual motion. The resulting effect is that those involved with the machinery, whether it is the well-sweep or any other labour saving device, are not left to enjoy their leisure, which is the promise of technology, but are forever making sure that it works properly, trying to improve it and to make it even more efficient. The ultimate result is a Heart in perpetual motion.

Xie, too, has some interesting associations. Needham alludes to the original meaning of the word as 'fetters' or 'shackles' (1956:125), speculating that because these particular implements made use of a padlock, it gave rise to the general meaning of machine or mechanism. But he also mentions the associated phonetically derived word which means 'to warn', leading him to conjecture that the *Daoist* unease with technology arose from the technology of the day being largely in the hands of feudal lords whose political power and authority they despised. I hope I am not being too fanciful in suggesting that when the Gardener voiced his rejection of the well-sweep, it was because embedded in the words *ji* and *xie* are voices that warn against the enticing promise of technology; they warn that once ensnared in the web of a technological culture, there is no escape.

Wu wei and dao technology

Allen's main argument, however, concerns his proposition that there could be a *dao* of technology. He extrapolates from the Gardener story that there are other technologies which, with their supporting knowledge, do not disturb the balance of nature insofar as they follow the principle of *wu wei* or actionless action. These, he says, should be viewed favourably. *Wu wei* is normally translated as the paradoxical 'actionless action', 'non-action' (Møllgaard 2007), or 'non-coersive activity' (Ames 2003). Needham gives the more specific: 'refraining from activity contrary to nature' (1956:68). Allen follows Needham. As examples of *dao* technology that uses the principle of *wu wei* he gives the double-action bellows, the reduced arc of a bridge and fenestrated rudders which lessen the resistance of water. These, he claims, demonstrate a fundamentally different approach to the crude force of machine technology as they are based on observation of the spontaneous organisation of nature. Such spontaneous organisation appears effortless as it makes use of actionless action. A characteristic feature of *Dao* technology, according to Allen is the way in which it mimics the effortlessness of nature by taking advantage of naturally present

forces. He claims that it is only *ingenious* machines – the kind of all-to-clever technology that *doesn't* make use of naturally occurring forces – that are the object of the Gardener's derision.

Taking first Allen's assertion that there is a *dao* of technology or engineering (Allen uses both terms interchangeably), it would appear that the Gardener's shame is based on the argument that the more sophisticated the machine, the more it lacks subtlety when contrasted with power that can be released by working with the *wu wei* or actionless action of the *dao*. *Wu wei* power makes use of the *yin* or passive qualities of the *dao* whereas machines operate on the basis of an excessive *yang* energy that destroys the balance of nature (Schipper 1993:197; Allen 2010:151). The true power of the *dao*, according to Allen, arises from the superior art of grasping things as they emerge into reality, and before they become fixed in material forms that require the brute strength of machinery to capture their resource. *Dao* engineering uses the power of the 'fruitful void' where one can '... read the incipience at work in circumstances ... It is knowing how to do the most with the least, achieve the greatest effectiveness by the least expenditure; at the limit, doing nothing with nothing left undone' (2010:157). It is such a *dao* of engineering that Allen believes the Gardener would commend.

Daoist empiricism

Allen's proposition for a '*dao* of technology' sounds attractive. If there can be a Zen art of motorbike maintenance, why not a *dao* of technology? However, the first problem to arise involves Allen's claim that *dao* technology could be based on a form of empiricism. He follows Needham's account of proto-science in ancient China (1978:98) which suggests there was a scientific base to Daoist knowledge that exploited observable phenomena. This accumulated knowledge attempted to repeat results of experimentation on a regular basis for the purpose of achieving specific end results. Certainly the ancient Chinese possessed a developed knowledge of the properties of materials, the way they

behaved when subjected to heat, combined with other materials and so forth. Much of this knowledge arose from the practice of alchemy, whose goal was the achievement of transcendence. So the Daoists were not without detailed technical know-how (literally know *how*, as theirs was a truly practical knowledge) as is evidenced by the *Lüshi Chunchiu* where it says: 'Copper is soft, tin is soft, but if you mix both metals together they become hard. If you heat them they will again become liquid. Thus if you wet one thing it becomes dry and solid; if you heat a (hard) thing it becomes liquid' (in Needham, 1956:72). From this account we can see that the empirical knowledge developed by the ancient Chinese encompassed the laws of causal physics in much the same way as we understand these in modern science. These laws of physics which turn natural forces into clearly understood rules and procedures are the foundation on which technology is based.

For Daoists, the philosophical purpose of acquiring empirical knowledge was not so much to use it for human gain or to control nature, as to produce a state of calm confidence in a *predictable* world (Needham, 1956: 63-68). Otherwise, for the ancient Chinese, human beings were prone to living a life of terror in a world constantly emerging out of chaos and confusion (*hundun* 混沌). This account of Daoist empiricism certainly fits the context of the *Zhuangzi* story which implies that, from what the Gardener tells us, this knowledge should not be put into use for the purpose of manipulating nature. For as the Gardener states,

With a heart like a machine in your breast, there will be a lacking in pure whiteness. The gods of life [of the body] will be disturbed and there will no longer be a place there for the Tao to dwell.

(tr. Schipper, 1993:196)

A clear distinction, however, needs to be made between Allen's examples of *dao* technology as a form of empiricism and the scientific knowledge described by Needham. The latter, it may be claimed, is *yang* in its fundamental mode, insofar as it shares the same purposeful character as that on which machine technology is based. *Dao* technology, on the other hand, may indeed have an empirical base

as it arises from the observation of how natural forces converge. However, the principle governing this technology is *wu wei*, which is manifestly *yin* (yielding and passive) in character. The laws of *wu wei* at work here are quite different from those of physics. When *wu wei* is at work there is a naturally occurring spontaneity, such that the latent energy of the source can only be captured *at random*, when it naturally occurs. For example the windmill will only work when the wind blows. If human beings benefit from this latent power, it is only indirectly. There are numerous examples of this latent power in the *Zhuangzi*. For instance, the swimmer who says, 'I go in with the currents and come out with the flow' (Palmer, 2006:162); cook Ting whose knowledge of the ox allows his knife to slice effortlessly with the grain of muscles and tendons (2006:22); the bell-stand carver who chooses only that piece of wood which contains the potential shape of bell-stand stand he is going to carve (2006: 163), and so on. In every instance the principle of *wu wei* requires finding the (re)source (the river, the ox, the piece of wood) anew and gauging what its particular latent tendency is at that given moment in time. Understanding the innate nature of the river, the ox, and the wood is the job of the craftsman, who in turn must be tuned in to his or her own innate nature through stillness and meditation.

The point I wish to make about these examples is that action that is *wu wei* leaves the medium *unchanged*. The river flows as it has always flowed, but its currents are a free by-product for the swimmer; the knife used by cook Ting never needs to be sharpened; the wood chosen by the bell-stand carver yields up the shape locked within it. Allen argues that the distinguishing characteristic of *dao* technology is that it appears to work effortlessly. I argue that Allen's analysis misses the point. The point is that the principle of *wu wei*, which characterises the examples given by Allen, ensures that the original source of latent power remains unchanged. *Wu wei* actions are *yin* and any attainment of human aims is, in a sense, incidental, merely a secondary by-product of the power of the river, the grain of the wood and the energy of the air.

The art of releasing the latent power in these diverse sources is not something that can simply be described or talked about. Wheelwright Pien says of his craft: 'When I work on a wheel, if I hit too softly, pleasant as this is, it doesn't make for a good wheel. If I hit furiously, I get tired and the thing doesn't work! So I grasp it in my hand and hold it in my heart. I cannot express this by word of mouth, I just know it. I cannot teach this to my son, nor can my son learn it from me' (Palmer, 2006:115). Knowledge of nature's *yin* qualities cannot be quantified in standard theories that are required by science or engineering as they cannot be repeated exactly on every occasion because the precise configuration of nature is different every time. Without the reduction to standard modes required by machinery, the apprentice must learn the craft through personal experience. Moreover, the intrinsic nature of this knowledge is such that it should *not* be quantified. That would assume that the aim was constant repeatability in order to guarantee permanent control over nature.

Chapter conclusion

Can there actually be a *dao* of technology? Given that technology is of its nature *yang* (that is, every example of machinery has a specific aim which it must achieve) in every instance its *raison d'être* is to harness a form of natural power and produce a standard, quantifiable result for some human purpose or other. Such a technology would go against the very grain of the *dao*.

Allen further deepens the contradiction posed by proposing a *dao* of technology by declaring that tools and machines are the same thing. He says: 'The truth is that tools *are* machines, mechanically speaking' (2010:152). He cites the examples in the *Zhuangzi* of artisans (the cook, wheelwright, bell-stand carver) whose skilful use of tools is viewed favourably. They prepare themselves for utter concentration with fasting and meditation, and so are able to perform their craft to their utmost ability by entering the 'fruitful void' of the *dao* and releasing its latent energy. Allen is right to imply that tools do not fall under Daoist strictures; they naturally belong to the craft of artisans. However, the

examples of *dao* engineering he gives, that is, the bellows, the bridge, and the fenestrated oars, are not *machines*. They fall into the same category as the artisan examples only insofar as they are artefacts or tools. They may of course be the product of technology or engineering, but that does not make them machines as such. It is possible that machines can exploit what he calls the 'self-organisation of nature'; however, by virtue of the fact that technology is being used at all, the self-organised nature becomes transformed into something different - a resource for human use. Therefore, to speak of a *dao* of technology involves a fundamental misnomer.

Therefore, when Allen writes of the *dao* of technology as 'an engineering that exploits properties of self-organisation in materials' (2010:156) he should avoid the language that suggests the harvesting of nature's bounty. That does not belong to the kind of *wu wei* action that the *Dao* is capable of engendering, for just as excessive use of *yang* energy in technology is wrong, as it alters the balance of nature, so the appropriation of latent *yin* energy would also be unethical. The author of the *Zhuangzi* makes this point when he states:

'If both yin and yang are corrupted, then the four seasons will not follow each other, the balance of hot and cold will not be kept, and this results in distress to the very bodies of the people!'

(tr. Palmer 2006: 82)

Corruption occurs when human beings start to use knowledge of nature's secrets for human ends.

The next chapter seeks to uncover what forces are at play in the human Heart that has succumbed to the lure of exploiting nature's reserves. It suggests that the Machine Heart warned against by the *Zhuangzi* is a reality of our own making, as we fall under the spell of scientific knowledge.

CHAPTER FOUR

The Machine Heart (*ji xin* 機心)

“What do you mean by the Heavenly and the human?”

Jo of the North Sea said, “Horses and oxen have four feet – this is what I mean by the Heavenly. Putting a halter on the horse’s head, piercing the ox’s nose – this is what I mean by the human. So I say: do not let what is human wipe out what is Heavenly; do not let what is purposeful wipe out what is fated; do not let [desire for] gain lead you after fame. Be cautious, guard it, and do not lose it – this is what I mean by returning to the True.”

Zhuangzi (tr. Watson, 1968: 182)

‘The botanists’ plants are not the flowers of the hedgerow; the ‘source’ which the geographer establishes for a river is not the ‘springhead in the dale.’

(Heidegger, 1978: 100)

The attitude of the Machine Heart

Having a Machine Heart is first and foremost an attitude towards the natural world. It starts with a curiosity to know how things work and soon becomes an unquenchable thirst to control nature and an addiction to technology. It is an attitude that can very quickly harden into a habit and become the defining mark of an entire society’s culture. The Machine Heart is rooted in an anthropocentric view that pitches efficient expenditure of effort and utilitarian values as the highest aspirations of humankind. In order to achieve these goals, the Machine Heart becomes closed in a loop of seeking knowledge of the essence of things which in turn feeds the world view it espouses. Ultimately, such a Heart can only see nature through the lens of scientific laws as a resource for human consumption. When this happens nature becomes disenchanting, or to use the words of Jo of the North, we ‘let what is human wipe out what is Heavenly’. Nature loses a quality which constitutes far more than the loss of an aesthetic or

religious gloss imposed on it by human sensibility. Human purposefulness and intention become the overriding factors that blind us to the sacred in nature.

If it is a loss for nature, it is a far more fundamental calamity for human beings. The Gardener tells us it disturbs the equilibrium of the body, and results in the body being a place where the gods no longer wish to dwell. For how can the gods inhabit a sterile land which no longer pulses with the unhampered flow of its own *qi* energy? Instead the body, or the life of the whole person, becomes a restless mechanism that chimes in time with the man-made cogs of technology that determine its habits and rhythms. This body has become no more than yet another natural resource and subject to the same laws. The mystery of the human Heart and of the human being are lost.

In turning to Heidegger's essay, *The Question Concerning Technology*, I seek to understand a little better what it means to have a Machine Heart (Heidegger, 1977). Although Heidegger did not comment on the *Zhuangzi* itself, it appears that there is some useful common ground between the sketchy outline of the dangers of technology, tantalisingly suggested by the Gardener story and other fleeting passages in this ancient Daoist text, and the fully fledged theory spelt out by Heidegger. This chapter will give a necessarily brief outline of the key elements of Heidegger's thoughts on the matter, and will then discuss some points of synergy with the *Zhuangzi*. These include the implications for nature of manipulating it into a resource for human consumption and the ensuing loss to our own humanity.

The question concerning technology

Heidegger's epistemological methodology involves breaking down a problem step by step in order to reveal the true, as opposed to the apparent, issue underlying the question. *The Question Concerning Technology* seeks to uncover what in truth is the essence of technology, or to phrase it differently, what is the thing that gives life to the many manifest examples of technology in modern

culture? Counter-intuitively, Heidegger tells us, technology is not something technological. For instance, the sum of our cumulative scientific knowledge that allows us to craft ever more sophisticated machines and gadgets does not constitute technology, although both craft - the origin of technology - and scientific knowledge are essential components of technology. Neither is it the philosophical principle of instrumentalism, that is, devising means to achieve specific ends. What characterises the innermost property of technology is, according to Heidegger, the pressure it places on nature to become simply a storehouse for human consumption. As Heidegger puts it: ‘...[that] which puts to nature the unreasonable demand that it supply energy that can be extracted and stored as such’ (1977:14). This is the one principle that dictates the existence of technology. Technology is the expression of our will to rearrange the power and energy stored in various forms in different natural resources and make it readily accessible for our own needs.

Heidegger refers to this as turning nature into a *Bestand* which is commonly translated into English as a ‘standing reserve’. The stilted English translation of the term fails to do justice to the full impact of Heidegger’s thought here. A more romanticised version might render it as ‘nature’s storehouse’ but that would lose the element of chilling calculation that the word *Bestand* conjures up. To think of nature as a stock-pile perhaps gets across something of the economic imperative that has been imposed on nature by our technological culture. Technology, according to Heidegger, commands nature to give up its latent energy resources in the following way: ‘That challenging happens in that the energy concealed in nature is unlocked, what is unlocked is transformed, what is transformed is stored up, what is stored up is, in turn, distributed, and what is distributed is switched about ever anew’ (1997:16). Any uniqueness in nature is lost in this reductive process, as further, the idea of the stockpile turns nature into a standard product, an object that can be *expedited*, (to use Heidegger’s phrase) to wherever it is determined by human beings it should go.

According to Jo of the North in the *Zhuangzi* the choice is ours whether we see nature as Heavenly or as a stockpile. 'Oxen and horses have four feet' which allow them to wander wherever they choose. By piercing their noses and fitting them with halters, human beings deprive them of natural lives and harness the power latent within their bodies. This goes against the Daoist principle of non-interference with nature. Once we start to domesticate animals in this way our ability to see them as possessors of intrinsic rights to a 'natural' life is lost for good. This is the same process of inurement as the Gardener arguably expresses when he objects to the seemingly innocuous use of such simple technology as the well-sweep, as this one act may lead us before long to complete dependence on machines. The habitual results in blindness our loss and nature's.

There is a degree of similarity between Heidegger's assertion that nature has become for us a *Bestand*, and the idea of a disenchanted nature or *Entzauberung* as discussed by Szerszynski (2005). The latter is premised on the reduction of nature to scientific principles which explain away all the mysteries of nature. It claims that the ultimate reality is that revealed by science. It is on the basis of this scientific knowledge that we have been able to create technologies that can strip nature of its inherent powers and turn it into the stockpile that Heidegger posits. But Heidegger makes the important point that it is not scientific knowledge as such that alters nature. Neither is it the degree to which modern technology has pervaded every quarter of nature. For it is a modern myth that *Entzauberung* belongs to the post Industrial Revolution era. The significance of the story of the Gardener in the *Zhuangzi* is that it warns against the human perspective that is capable of ignoring the Heavenly in nature and results in damage to humanity.

Heidegger's view is similar insofar as he states that what characterises technology is the *attitude* behind our impulse to make nature a *Bestand*. He gives some interesting examples to make his point - examples that resonate closely with some of those in the *Zhuangzi*. He cites the windmill, which is moved by air currents but does not store them; the field cultivated by the

peasant is not the same as agribusiness; the River Rhine is not the energy resource that is created by the dam powering the hydroelectric plant. These are instances that demonstrate how the human eye can flicker between seeing nature as sacred or through the lens of scientific realism and technological efficiency. For the Gardener in the *Zhuangzi* it would be an anathema to follow Zigon's advice that with little effort he could achieve a great result. If he were to use the well-sweep to irrigate his patch of land it would, to use Heidegger's words, 'challenge the soil of the field' (1997:15) preventing the natural course of events whereby the field would ensure the fertility of the crop without undue forcing.

Before nature becomes a *Bestand*, there is the possibility that its true being (it's Heavenly nature) may yet become apparent to us, for nature has a revelatory aspect to it for Heidegger. What is hidden in nature is not the scientific laws that determine its functioning or the composition of minerals that form its energy resource. These are the objects of human curiosity and striving for knowledge. What nature can reveal is the true essence of creativity that is encapsulated in what Heidegger refers to as Being when it manifests itself in the world of phenomena. For Heidegger the natural creativity of Being expressed in nature as poetry (*poesis*) is prevented when 'Modern science's way of representing pursues and entraps nature as a calculable coherence of forces' (1997:21). In the *Zhuangzi*, where the Machine Heart holds sway fruitfulness is denied its natural form of expression whether in the actual fruiting of the tree or the luxurious coats of animals.

Whereas for Heidegger the stock-piling of nature as reserve-stores inhibits the revelation of Being in nature's 'natural' form, in the *Zhuangzi* it is formulated in a slightly different way, as utilitarianism strips things of their entitlement to life. This is what Jo of the North, in the quotation above, refers to when he says: 'Do not let what is purposeful wipe out what is fated' (Watson Tr. 1968: 182). The potential energy resource contained in the natural life-cycles of creatures and living entities should not be expedited by the human demand that they yield up

their power prematurely. This robs them of their entitlement to a natural life span. This is a recurrent theme in the *Zhuangzi*. In one of several stories concerning trees, Master Shih dreams about a tree which tells him about ornamental trees: 'Because they are useful, they suffer, and they are unable to live out the years Heaven has given to them. They have only their usefulness to blame for this destruction wrought by the people ... Furthermore, you and I are both [such] things' (Palmer, 2006:34). This suggests that the instrumentalisation of nature can easily be extended to people – we become 'human resources,' something that Heidegger's essay goes on to affirm.

Further, this passage implies that nature bequeaths the tree a right to a future life which should not be curtailed for human ends. This does not imply a doctrine of sentientism that requires the tree to have conscious knowledge of its future in order to possess any intrinsic rights, but there is the idea that there is something wrong with systematically curtailing the natural lifespan of all animate and inanimate things. In this story the surreal medium of the dream allows the tree a conscious identity and the power of speech, suggesting that it is only when we imaginatively personify natural objects that we can recognise their right to defend their lives. In 'real' life the tree cannot protest its right to life, for its usefulness to humans is a guarantor of its own destruction. The same sentiment is expressed about the fox and snow leopard who live in the mountain forest and only go out when they have to for fear of being caught. Their coats are to blame for their lives being cut short (Palmer, 2006:168).

Knowing the essential nature of things

The *Zhuangzi* suggests it is the endless seeking after knowledge in order to manipulate nature that is misguided. The example of the Yellow Emperor is a case in point of what Daoists considered to be the ill-conceived quest for knowledge. The Emperor says: 'I would like to grasp the essence of Heaven and Earth and use them to assist the harvest of the five crops in order to help the people. I would like to be able to direct yin and yang in order to bring all things to life' (Palmer, 2006:85). Even if the motivation is philanthropic, the

consequences of seeking domination over nature's resources are predictable. The Emperor is told that since he started to rule, nature's power to order things harmoniously have diminished: '...the very breath of the clouds has not yet formed, and yet it rains; the trees and the bushes drop their leaves before they have turned yellow; the light of the sun and moon grows ever weaker.' The message of the *Zhuangzi* is clear: meddle with nature at your peril. This passage is particularly interesting as it dispels any idea that modern day environmental ethics may possess about Western culture being the source of pernicious scientific thinking while romanticising traditional Chinese concepts of *yin* and *yang*. The Daoist view expressed in the *Zhuangzi* indicates that even these pre-scientific concepts were subject scepticism about manipulating forces of nature for the benefit of humankind.

How the *Zhuangzi* accounts for natural patterns and energies being disrupted as a result of human interference is somewhat different from the present day narrative. Today's science offers a number of causes for natural disasters. These range from CO₂ induced global warming, upsetting the fine balance of the biosphere through pollution, and the devastation of habitats and species extinction. Although the degree to which human action is responsible is disputed, our physical interventions are generally agreed to be at least partly responsible. The model behind the modern explanation is that of pure causality; however, the explanation offered by the *Zhuangzi*, however, is more metaphysical. There are a number of references in the *Zhuangzi* to the idea that something fundamental in nature is being altered when human beings start to manipulate nature:

'The disruption of the ways of Heaven distresses the true being of things [*qing* 情], halting the development of Heaven's Mysteries ... This causes animals to disperse, the birds to sing throughout the night, misfortune to hit the crops and woods, and disaster to blight the very insects themselves. Alas, all this is caused by the people's error of thinking they know how to rule!'

(tr.Palmer, 2006:88)

Elsewhere, this is put as ‘innate nature’: ‘There is no humble insect, not even any plant, that has not lost its innate nature (*xing* 性). This is the consequence for the world of seeking after knowledge’ (Palmer 2006:80). And later in the same chapter, ‘We let the world be, fearful of spoiling its innate nature; we leave it alone, fearful of those who adversely affect the world’s Virtue. If the nature of everything under Heaven is not distorted, if the world’s Virtue is not despoiled, then what need is there to govern the world?’ (2006: 82).

The phrases ‘the true being of things’ (*qing* 情) and ‘innate nature’ (*xing* 性) are closely related, sharing the first component of their Chinese character. They also share related meaning insofar as *qing* suggests ‘essence’, or that which we experience in our specific encounter with different entities. Graham explains that *qing* as the essence of a thing is closely linked with nominalist approach to language, as a particular thing is identified on the basis of its *qing* (1989:99). Innate nature, *xing*, is described by Møllgaard as ‘... the spontaneous movement and natural development of a being in the movement of life’ (2007:39). Møllgaard’s definition suggests that *xing* should not be seen as a static set of characteristics, but encompasses the ability of the thing in question to change throughout its existence. For example, science might understand the essence of a sunflower seen in terms of its specific characteristics captured in the snapshot of that particular stage of its existence. The Daoist, however, would see the essence of the sunflower in the entirety of its unfolding existence. This is something that is key to the passages above. According to Graham (1989:123) *xing* was used in the everyday language of Mengzi’s time to denote the qualities that any living thing was born with (its ‘in-nate’ essence). The developmental characteristics of *xing* are suggested from its derived etymology from the word *sheng* (生) – to be born or to live (Unger, 2000: 95-98).

Palmer follows the usual convention of translating *de* as ‘virtue’ which today carries strong moral overtones. Karyn Lai offers an interesting discussion which points to the pitfalls associated with the word virtue (2003:249-251). She

suggests that there is little to support *de* as suggesting moral goodness. Palmer's translation, therefore, gives the rather misleading idea that interference with the essential nature of natural phenomena is morally untenable. If, instead, we follow Lai's argument that *de* denotes the particular integrity or power inherent in specific manifestations of the *dao*, this gives us a different reading. What we then understand is that what the *Zhuangzi* is referring to is the object-specific, inner, or hidden power that every living thing is endowed with. This suggests that it is not so much a moral concern, but that human involvement with the world is about the utilization of the power of all things.

So when the *Zhuangzi* talks of *qing* and *xing* as being fundamentally altered by the human search for knowledge, he is making the claim that the human attitude encapsulated in the Machine Heart delimits the very essence of things. It alters the ontological basis of existence, over their entire lifespan, for those entities whose inner power we are seeking to capture within our system of knowledge. Put simply, things are not allowed to be themselves once they are the subject of scientific objectification. In Heidegger's words, 'Modern science's way of representing pursues and entraps nature as a calculable coherence of forces' (1997:21). In order to see animals, nature, and all natural phenomena scientifically, an important part of their true identity is left behind. At its most basic, they give up their naturally endowed lives, in order to make their essence, or power available for human use. They cannot be seen in their completeness, and, as a result, human beings lose something of their humanity if they persevere in seeing the world purely as a utilitarian resource.

Chapter conclusion

When we see the world without compassion we are being governed by the Machine Heart. The *Zhuangzi* says: 'The disruption of the ways of Heaven distresses the true being of things [*qing* 情], halting the development of Heaven's Mysteries ...' The word distress is strong. It implies a fundamental unbalancing of the way that things should naturally be. All creatures are part of

a food chain, so naturally prey for other creatures, but human actions are about more than just nourishment for the sake of subsistence. Human activity constantly tries to suck the energy out of this natural pattern of how things are, and this results in imbalance and distortion. This is a view which finds resonance in Heidegger's thinking when he writes about the scientific view of nature denying us the possibility of accessing the revelatory aspect of nature. The story of the Gardener in the *Zhuangzi* tells us that this process starts with the human Heart. What aspect of the Heart's many capabilities is that allows the process to take a hold in the first instance?

CHAPTER FIVE

The Origin of the Machine Heart (*ji xie* 機心):

Naming and Classifying

When we start to regulate the world, we introduce names.
But once names have been assigned,
We must know when to stop.
Knowing when to stop is how to avoid danger.

Chapter 32 *Daodejing* (tr. Ames , 2003:127)

He [Cangjie] observed the footprints of birds and beasts, and recognized that meaningful patterns could be distinguished. For the first time he created graphs and tallies. All types of craftsmen were thereby put in order, and all types of products were thereby examined.

(tr. Lewis, 1999:272)

Regulation of the world: the Confucian view

One specific ability that can be attributed to the Heart concerns logical thinking and the classification of phenomena. The *Zhuangzi* tells us that, 'If there is a name, there is reality and they really exist. If there is no name, there is no reality and no thing' (Palmer, 2006:234). The 'regulation of the world' by naming referred to in the quotation above from the *Daodejing* is the pre-technological interpretation of human environmental existence in order to make sense of, and to control, future situations. Naming the world is, at its most basic, a struggle for mastery over the environment. It becomes a feature of the Machine Heart when the only engagement with nature is through the medium of logical categories and scientific classification. The Genesis story is often cited as the root of the Western, anthropocentric domination over nature. Adam is awarded the right to name the creatures of God's creation and to govern over them. In the Daoist account, the *dao* gives birth to the myriad things: the uncountable fecundity of natural forms. Human beings naturally impose order on the environment by

naming, classifying and seeking logical connections between phenomena that might otherwise seem chaotic and unpredictable (See Needham 1956:63-67). The philosopher Xunzi tells us that, 'Through using the logical categories, one deals with diversity; through using the principle of unity, one deals with the myriad ... Abandon these principles, and the empire will fall into decay' (Xunzi, 1990:103).

As Graham describes, the later Mohist canon shows the same, nominalist approach to language. Being able to identify the category to which a thing belongs to is to own the source of knowledge about it (1989:141). Graham also suggests that this was certainly the backdrop to the critique of language contained in the *Zhuangzi*:

In response to the instability of reference ("what is said is not fixed") the Mohists aspire to the ideal of an austere, functional, transparent language; the Confucians emphasize the need for the rectification of names, for the proper correspondence of things and names supposedly sustain moral-political order; the logicians expound paradoxes that claim internal, self-referential, analytical coherence.

(Graham, 1989:95)

Ames' commentary on Chapter 32 of the *Daodejing*, however, brings out the ironic reversal that occurs: 'We quickly fall into the trap of turning names into things, so that these names identify some more real "I know-not-what" that stands independent of the now "superficial" way in which we actually experience any particular event' (2003:127). The Nietzschean tone of Ames' interpretation is unmistakable. Concepts that serve a useful purpose in enabling human beings to negotiate a path through the world become embedded over time in rigid structures that carry moral and cultural meaning over and above the original, practical assignation of the word. Ames' genealogical exploration hints that the 'mechanisation' of the Heart starts with a form of a Nietzschean 'will to power'. The *Daodejing* suggests that there is a definite power drive in the naming process, and like all human wants and desires, it requires our awareness in order to contain it, before it becomes so

deeply ingrained as a morally encoded human activity, that we never question our right to wield such power.

For Confucian thinkers, the ability to classify, organise and set the standard by which everything can be understood and measured was essentially a moral function of the human heart, moreover a function that only the highest human being could perform. The *Zhongyong* tells us that:

‘Thus, one who is not in the position of the Son of Heaven does not discourse upon the rites, not does he issue regulations regarding standard measures or conduct enquiries into the form of the written script. In all the world today, all carriages run on wheels of uniform gauge, all official documents use uniform script, and all customary practices follow uniform ethical standards.’

(tr. Plaks, 2003: 49)

Discoursing, creating laws and rules and making moral judgement are all examples of skills that require a high degree of discernment of differences, measuring and creating standard ways of proceeding that can buffer us from the chaotic diversities of life. But according to Confucius, the ability to see order in the world arises in the first place from a strong moral disposition. This disposition towards order and the creation of regulatory standards is also the prerequisite for the creation of technological devices and it is interesting to note how the imagery of technology takes on added significance as it is used to convey a normative view of the ethics of rulership and justice in other Confucian texts. Not everyone’s word carried such power, the supreme repository of political power being the emperor. Chapter 9 of the *Huinanzi* attempts to explain the conditions under which the ruler’s words carry unquestioning authority:

Because the crosspiece of a pair of scales shows no bias towards either the right or the left in weighing, it can be level (*p’ing*). Because a plumb line shows no bias toward inside or out in measuring, it can be straight (*cheng*). Because the ruler in administering the law shows no bias toward those he likes or dislikes, his words can be command (*ming*).

(tr. Ames, 1994:174)

The passage goes on to elaborate on the imagery of the pair of scales and the plumb line, examples of early measuring technology, by bringing out their essential characteristics. These are constancy, accuracy, fitness for purpose, and lasting use. These characteristics are not unique to the instruments in question. In fact, they constitute the general design specification for any piece of technology, and could be applied to any modern piece of equipment. Indeed, they still form the blueprint for many of the qualities we seek in technological solutions today.

The use of the metaphor of the set of scales to talk about the Heart is not uncommon in the early Chinese texts. Xunzi describes the moral 'weighing up' processes of the Heart in terms of the balancing of scales (Graham tr. 1989:252). In this way, the early Chinese authors of these texts demonstrate a high degree of awareness of the theoretical principles of design and function in technology. They also show the extent to which such qualities were highly valued, such that their metaphorical meaning was instantly understood. The values of technology at this point start to infiltrate the texture of the Heart itself, and indicate that the criteria that determined the very best technology were also considered as the qualities that gave unquestioning power to the judgement to the Heart (and therefore the word of the ruler). In this way, we see ideas associated with technology taking on moral status as guides to thinking and behaviour.

Proper social ordering was a key part of Confucian moral doctrine during the period when the *Zhuangzi* was written. For Xunzi, social and economic order mesh closely with nature. For example, each geographical area should yield up its naturally present resources, and people of every skill, status and trade in society should play their part in the smoothly running mechanism of society (Xunzi, 1990:102). However, Møllgaard (2007:33) points out that that for Xunzi, there is little that is natural in the human imposition of order. Man-made rules, whether in relation to ritual or social order, are essentially artificial as their aim is to control nature. This extends to human desires as well as nature's chaotic forces.

Xunzi criticises economic competition as being potentially divisive to society. The economic system he advocates is based on sufficient supply, as nature itself is seen as the source of ever abundant bounty, providing social codes and hierarchies are adhered to. He praises the harmony that is achieved by all classes of people working together. The whole moral structure of society should be held together by the authority of the ruler who imposes just laws. Support for this kind of ordered world view is also present in the *Huainanzi*, which states that in the idealised time of ancient history,

‘A worker did not have more than one skill, a scholar did not combine two offices (*kuan*). Each kept to his own province and did not interfere with others (*kan*); each person found his niche and each thing found its place (*an*). As a result, products were not of inferior quality and duties were not neglected (*man*).’

(tr. Ames, 1994:176)

The Machine Heart of Confucianism becomes the collective Heart of society, as optimum social functioning is conceived as a precise mechanism that relies on each individual’s recognition of their place and role. The entire structure is upheld by moral principles that deplore the potential anarchy that may be caused by individualism.

The environmental theory contained in this Confucian account is that the world of Heaven, Earth and Man is tightly knit, held together by natural laws that reinforce a strict hierarchy where everyone and everything has its place. So long as the classifications are adhered to, harmony and prosperity will follow. Xunzi expresses great faith in nature supplying all that is needed: ‘Those that supply food and nourishment cannot be counted. Heaven and Earth in producing the myriad things assuredly intended that there be surpluses adequate to feed humanity’ (1990:128). This is not to say that their people should wantonly consume, as careful planning and management of resources was key to the sound rulership of the state. Xunzi’s sentiments are echoed by the author of *The Art of Rulership*, who says:

The ruler of men should take advantage of the season of heaven above (*shih*), make full use of the earth's plenty below (*t'sai*), and deploy the energies of the people wisely in between (*li*). As a result, all living things will reach maturity and the five grains will thrive (*chih*).

(tr. Ames, 1994:200)

Knowing when to stop: the Daoist view

In contrast with Xunzi's Confucian support of order and logical ordering of the world, the *Zhuangzi*, rather like the *Daodejing*, slates the relentless desire for understanding the world through ever finer classifications and distinctions that make up the body of knowledge valued by society. The *Zhuangzi* urges us not to pursue the path of imposing language as our primary means of interacting with and understanding nature. It states, 'Heaven and Earth have great beauty but no words. The four seasons follow their regular path but do not debate it. All forms of life have their distinct natures but do not discuss them' (2006:189). It is precisely the regulation of the world through language that the Confucians found so commendable to which the *Zhuangzi* objects and holds responsible for its deterioration. The process of decline which the *Zhuangzi* identifies in society starts with the particularisation of phenomena into nominal forms which then develop into laws, edicts and morals imposed by rulers, and the seeking after knowledge by different intellectual schools. In sharp contrast to the author of the *Huainanzi* who praised contemporary technology, *Zhuangzi* despairs that:

'The whole world sought knowledge and all the different peoples of the world were distracted. At this stage the axe and saw came into their own; the plumb line determined and brought execution; the hammer and gouge made their deep marks and the whole world fell into disarray. The crime lies with playing around with people's hearts.'

(tr. Palmer, 1996: 85)

Here, the axe and the plumb line are seen not as the highest moral values that people could aspire to, but the worst manifestation of the Machine Heart which coldly calculates and imposes mechanical criteria on to human life.

Chapter conclusion

The Confucian regulation of the world through naming, classifying and imposing logical order is based on a superior human relationship to nature. Confucians claim this relationship is morally endorsed by Heaven, however Daoists would see it as an anthropocentric view that creates distinctions and moral hierarchies in order only to benefit humankind. It is here that the seeds of the Machine Heart can be found. On the Daoist view, the *dao* does not favour human beings above other species. The ability to name the essence of a thing and to understand the hidden qualities of matter, calculating and releasing its potential energy, are propensities of the Machine Heart. The Daoist view is deeply suspicious of imposing human values on to nature or of any attempt to manipulate nature. It is not knowledge as such that is wrong; it is human frailty that does not know when to stop. Chapter 80 of the *Daodejing* envisages a perfect society that possesses all kinds of tools and technology but makes the conscious choice *not* to make use of them:

Small country, few people –
Hundreds of devices,
But none are used.

People ponder on death
And don't travel far.
They have carriages and boats,
But no one goes on board;
Weapons and armor,
But no one brandishes them.
They use knotted cords for counting.

(tr. Addis., 1993: 80)

CONCLUSION

In Defence of the Useless

The first chapter of the *Zhuangzi* tells of an enormous fish that covers unimaginable distances. It rises out of the sea and changes into an equally huge bird that covers further, astonishingly large distances. Who knows how it does this or what its purpose is, for it certainly does not follow any known pattern or natural law. Throughout the *Zhuangzi* there are many little parables that touch on this theme of perspective. Jo of the North says, 'From the point of view of the tiniest, we look at what is so enormous and we cannot comprehend it. From the point of view of the most enormous, we look at what is tiniest and we cannot see it clearly' (Palmer tr. 2006:139). The underlying message of the *Zhuangzi*, if it can be framed in this way, is that human values are relative. Therefore, we should be cautious in accepting the claim that there is only one ultimate reality. The world of machine technology is built upon scientific realism. This closes off all other perspectives and locks us into only one conclusion: that we are bound by the knowledge base we have created to see the world in terms of scientific laws and possible resources for human consumption. There is no freedom for either humanity or nature in this world view. The ethical relationship is such that nature is always the disadvantaged party.

Curiosity and inventiveness are inherent human qualities. The scientific view of the world has become an important part of our culture, but if we allow only one model of the world to be the 'true' one – that is the narrative endorsed by scientific realism – we lose our ability to feel for nature. We then start to acquire the habits that are dictated by a Machine Heart. The choices for us and for nature become bleak indeed as all our actions and ethical judgements are defined by what is judged to be the ultimate good: the efficient extraction of resources from nature.

The *Zhuangzi*, however, tells us that our innate nature (*xing* 性) allows for a different mode of existence. This is a mode where we have the power to *be*. In order to experience co-being with nature, we must shut off the outside stimulus that constantly feeds the Heart. Without thoughts, the human Heart becomes a truly knowing Heart, wordlessly understanding the mysteries of nature. According to Daoist belief this is the innate pure state that we are born with, evidenced by the unthinking pure life-force of the baby. When we attain the state of the ‘uncarved block’ we are able to access a state of pure potentiality. It is the same power that is found in the river, the tree, and the lives of animals.

The scientific world view tells us how to predict nature. The technological world view, which is so closely linked to science, tells us everything must have a purpose, preferably a purpose that will benefit humankind. The *Zhuangzi* dares us to think otherwise. We do not have to view nature’s creatures in terms of their usefulness. The tree in the *Zhuangzi* is a case in point.

Hui Tzu said to Chuang:
I have a big tree,
The kind they all a “stink tree.”
The trunk is so distorted,
So full of knots,
No one can get a straight plank
Out of it. The branches are so crooked
You cannot cut them up
In any way that makes sense.

There it stands beside the road.
No carpenter will even look at it.

Zhuangzi (tr. Merton, 1965)

This is one of those rare cases where human beings have seen no use. Therefore the tree has been allowed to reach a great size. This would have been truly unusual in ancient China where deforestation and the demand for timber wreaked havoc on the environment. This tree has acquired an almost sacred status simply by virtue of the fact that it had no useful human purpose whatsoever.

The Gardener, too, claims his right to useless activity. His watering is almost pointless as he is barely able to make an impact on his garden. His toil and effort are disproportionate to the result he manages to achieve. But he defends his right to such useless activity. Learning to appreciate the useless is something we must learn to do. If we are to allow nature to reclaim the magic of which it has been robbed by technology we must stop seeking the useful in every opportunistic encounter.

Hui Tzu said to Chuang Tzu:

“All your teaching is centred on what has no use.”

Chuang Tzu replied:

“If you have no appreciation for what has no use
You cannot begin to talk about what can be used.
The earth, for example, is broad and vast
But of all this expanse a man uses only the few inches
Upon which he happens to be standing.
Now suppose that you suddenly take away
All that he is not actually using
So that, all around his feet a gulf
Yawns, and he stands in a Void,
With nowhere solid except right under each foot:
How long will he be able to use what he is using?”

Hui Tzu said: “It would cease to serve any purpose.”

Chuang Tzu concluded:

“This shows the absolute necessity
Of what has ‘no use’.”

Zhuangzi (tr. Merton: 1965)

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