Metaphysics of (śūnyatā: emptiness).Western analytical approach to Zen philosophy

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Western Analytical Approach to Zen Philosophy

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Abstract

Zen is a coherent system of philosophically plausible ideas. But Zen is often misunderstood to be anti-analytical or illogical. This is due to its core concept 空 (śūnyatā; emptiness). It is an idea that our experience and knowledge do not correctly represent the way the world is. 空 (emptiness) is not, however, a nihilistic concept. Zen believes that recognising our limitation and identifying our miscomprehension enable us to grasp the way the world really is (如; tathāta). The denial of our ordinary knowledge is, therefore, key to attain 悟 (bodhi; the enlightenment) and ultimately leads us to be liberated from 苦 (dukha; suffering). This thesis therefore concentrates on negating our metaphysical beliefs that shape our fundamental world view.

In order to make this thesis accessible to western readers who has little or no knowledge of eastern philosophy, I will pick up only conclusion from Zen and try to reach the same conclusion using arguments which western philosophers are familiar with. I hope this will demystify Zen and, in future it will be studies in other branches of philosophy and as a sub-category of eastern or world philosophy.

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Introduction

I: Zen and Metaphysics

Zen is considered to be an unique form of Buddhism that has been widely employed in China and Japan. Zen is becoming more popular in western countries where Zen was unheard of fifty years ago. It is however, unfortunate that Zen is not truly studied by western academics. In the tradition of western academic philosophy, Zen is normally studied only under a sub-category of Eastern philosophy, despite the fact that it could offer interesting and valid accounts in a range of topics, such as in ethics, epistemology, aesthetics, philosophy of the mind, political philosophy, philosophy of language, and so forth. A primal aim of this thesis is to present Zen in a terminology and manner that western philosophers are familiar with, in order to make Zen accessible to the western philosopher. By doing so, I hope that in the future, Zen can be studied not only under the category of eastern philosophy, but also in other branches of philosophy and beyond.

One of the many reasons Zen is not studied in the west is because it is falsely believed that Zen is some sort of mysticism or religion whose ideas are too abstract and anti-analytical to be compatible with western philosophy. I agree that on the surface Zen teachings appear to be puzzling and illogical at the best, anti-analytical or utter nonsense, at the worst. The following are examples that trigger such sceptics:

= The moon cannot be stolen =

Ryokan[1], a Zen master, lived the simplest kind of life in a little hut at the foot of a mountain. One evening, a thief visited the hut only to

[1] 良寛;Ryoukan(Japan;1758-1831) A Zen monk of Sōtō school who had simple and down-to-earth life styles. He was known for his poems, calligraphy and love for all living things. There is a famous nursery rhyme that praise how he played with and looked after kids from a village near Mt. Kugami.

discover there was nothing in it to steal. Ryokan returned and caught him. 'You may have come a long way to visit me,' he told the prowler, 'and you should not return empty-handed. Please take my clothes as a gift.' The thief was bewildered. He took the clothes and slunk away. Ryokan sat naked, watching the moon. 'Poor fellow,' he mused, 'I wish I could give this beautiful moon.'[2]

= Nansen cuts the cat in two =

Nansen[3] saw the monks of the eastern and western halls fighting over a cat. He seized the cat and told the monks: 'If any of you say a good word [give an immediate expression of his Zen], you can save the cat.' No one answered. So Nansen boldly cleaved the cat into two pieces. That evening Joshu[4] returned and Nansen told him about this. Joshu at once removed his sandals and, placing them on his head walked out. Nansen said : 'If you had been there, you could have saved the cat.'[5]

Why did 良寛 (Ryokan) give away his clothes? Why did he not punish the thief, or at least teach the thief that stealing is wrong? Why did 南泉 (Nansen) kill the cat, even though monks are not supposed to kill even an insect? Why does the placing of sandals on a person's head signify true understanding of Zen? One thing people have to understand about Zen is that Zen ethics, aesthetics, theory of justice and philosophy of language are all natural outcomes of Zen metaphysics, Zen's fundamental view of the world. I believe that without understanding underlying metaphysical concepts of Zen, it is impossible to understand Zen at all. In other words, the above stories make no sense unless Zen's metaphysical view of the world is understood. This is why my thesis aims to unravel Zen's metaphysical view so that we can understand how it affects epistemology, ethics,

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[2] Rep, Paul (ed.) (1957), *Zen Flesh, Zen Bones*, (London; Penguin Books Ltd.), p.23

[3] 南泉普願; Nan-ch'uan P'u-yüan (China;748-834). Ch'an monk of T'ang dynasty. He possessed depth knowledge in various Buddhist texts.

[4] 趙州從諗; Zhao-Zhou Cóng-shěn (China;778-897). Nansen Fugan's disciple. He is known for his spontaneous method of teaching, instead of strict disciplinary teaching method that was common in his time.

[5] The story was recorded in 無門関 (Gateless Gate). this exact translation is extracted from Rep, Paul (ed.) (1957) *Zen Flesh, Zen Bones*, (London; Penguine Book Ltd), p.105

and so forth. The primal goal of this thesis is to establish Zen as a coherent system of plausible metaphysical thoughts and to combat the commonly held perception of Zen as an inconsistent collection of anti-analytical beliefs.

By illustrating how important metaphysics is for the understanding of Zen, I would like also to bring much neglected metaphysics back to the centre stage of philosophy. Metaphysics is the study which aims to understand the fundamental nature and characteristics of reality and everything that exists. Metaphysics is a quest to find who or what we are, and what reality or the universe is. Unfortunately, metaphysics is sidelined in modern philosophy and also in people's everyday thinking. Metaphysics is regarded as far-fetched and irrelevant to other branches of philosophy and our everyday lives. I strongly disagree with such a belief. I think that without a metaphysical foundation, it is not possible to fruitfully tackle everyday questions as well as philosophical ones. It is not that no one holds strong metaphysical views, in fact everyone holds certain and often strong metaphysical belief or beliefs. The problem is that most metaphysical beliefs are so deeply (culturally or religiously) embedded in our consciousness, that people accept them without questioning them. For example, people hold metaphysical beliefs such as the distinction between mind and body, existence of a material (physical) universe, existence of time, causation, self as an individual entity. People hold these beliefs without contemplating on whether or not such beliefs are genuinely true or at least plausible. By introducing Zen metaphysical ideas that are different from commonly held metaphysical beliefs of the west, I would like to inspire people to re-examine their fundamental metaphysical beliefs.

II: General definition of Zen

Before I explain Zen's metaphysical position, it is important and necessary for readers who are not familiar with Zen philosophy to understand what Zen is. Zen is often described as Zen Buddhism, and it is considered to be a branch of Buddhism. However, Zen is different from the religious form of Buddhism that is popular not only in Asian cultures but also in the west. It is therefore important to clarify differences between Zen and the religious form of Buddhism which I hereby describe as the Popular Buddhism. Even though Zen was imported from

China to Japan, due to historical, cultural, political and religious differences between China and Japan, Japanese Zen developed differently from Chinese Zen. I would like to concentrate on the Japanese form rather than the Chinese form of Zen, simply because I am more familiar with Japanese Zen than Chinese Zen. Despite the fact that both Chinese Zen and Japanese Zen are denoted by the same Chinese semantic character "禅", in order to distinguish Japanese form and Chinese form, I use Japanese pronunciation "Zen" for the former and Chinese pronunciation "Ch'an" for the latter.

Ch'an was invented in the seventh century A.D., some 1100 years after the death of Gautama Buddha, who is believed to have established Buddhism. During this 1100 years gap, many changes and transformations had happened to Buddhism. Therefore, Buddhism in China around the seventh century was different from the original Buddhism. The motive for the invention of Ch'an was to reject all those changes that had taken place and to go back to the original teaching of Gautama Buddha. Among many changes that had occurred to Buddhism, two main things Ch'an aimed to reject were *canonication* and *religionisation* of Buddhism. Canonication of Buddhism was the most popular way in which Buddhism was practised around the time Ch'an was invented. The most popular way was comprised of chanting, memorising and studying of texts called 経 (sūtras) and 律 (vinayas). Such practices were popular because people believed that 経 (sūtras) and 律 (vinayas) were the direct teaching of Gautama Buddha, and they possess mystical power which enables the believer to attain 悟 (bodhi; the enlightenment). Ch'an considered that such practices were not the true teaching of Buddhism, since there were several reasons to believe that neither 経 (sūtras) nor 律 (vinayas) were the original teaching of Gautama Buddha at all. The first reason is the fact that all Buddhist texts were written at least 400 years after the death of Gautama Buddha. Transcriptions of Gautama Buddha's original teaching were not available because, like any other Indian philosophy or religion of his time, the teaching was handed down in oral form. The absence of written texts by Gautama Buddha meant that his ideas and words were lost, fragmented, distorted or misconveyed. In addition to these involuntary changes, with oral tradition, anyone can add his personal ideas, opinion and his interpretation of

Gautama Buddha's teaching as direct words of Gautama Buddha by simply adding the opening line "Gautama Buddha said that...". In order to maintain Buddhism true to Gautama Buddha's teaching, *sangīti* (結集; gatherings of Buddhist practitioners to recite teaching together) were organised, in order to compare and correct what each follower of Gautama Buddha remembered or understood. Note that this *sangīti* still took the oral form of chanting/singing, therefore the outcome was again subject to misinterpretation and distortion. On the third *sangīti*, around the time of King Ashoka[6] around 250 B.C., disagreements concerning a *vinaya* (律) resulted in schism of Buddhism. Because disagreements were not solved and different schools of Buddhism kept their versions of *vinaya* (律), there is no way of knowing which was the genuine original teaching of Gautama Buddha. The second reason to believe that 経 (sūtras) and 律 (vinayas) are not true to the original teaching of Gautama Buddha is that a further schism of Buddhism took place as the result of its interaction with other religions and philosophies. Many ideas are absorbed from Indian religion/philosophy, later known as Hinduism. This is obvious from the fact that later Buddhist teachings contain many ideas that did not appear in earlier teachings. This, I believe, was an unavoidable process. Even though Buddhism originates in the teaching of Gautama Buddha, it is wrong to assume that he single-handedly invented a new system of thought completely alien to Indian religions and philosophies which existed in his time. What is considered to be the original teaching of Gautama Buddha itself contains many ideas from Indian religion/philosophy. In fact in India, Buddhism is often regarded as a branch of Hinduism. The absorption of different ideas created further disagreements within Buddhism. By the time Buddhist teachings of *sūtras* (経) and *vinayas* (律) were finally committed to writing, these texts contained many different ideas that were not likely to be ideas of Gautama Buddha. This is proven by the fact that there are inconsistencies even between earlier texts. The absorption of other ideas and divergence of teaching continued, even after Buddhism teachings were finally put

[6] Aśoka (Ind. 272-231 B.C.) 阿育王 in Japanese and Chinese. The third king of Maurya kingdom who succeeded to unite ancient India. He was a patron of Buddhism and ordered to elect inscribed pillars and to carve cliff faces that provide invaluable religious and historical insight of his time.

into written forms. Among these schism, two important movements that arose for Ch'an/Zen were *Mahāyāna* (大乗仏教) and *Mādhyamika* school (中観派). *Mahāyāna* (大乗仏教) is defined by the belief that anyone can attain *bodhi* (悟; the enlightenment) and become *buddha* (仏陀) or *bodhisattva* (菩薩). This is the rejection of the tradition that *bodhi* (悟) is available only to *bhikşu* (比丘) and *bhikşunī* (比丘尼), ordained members who underwent *pravrajyā* (出家), the act of leaving the ordinary world and adopting an ascetic life in a monastery. *Mahāyāna* means "a big vehicle" which signifies its aim; to enlighten everyone rather than to keep the enlightenment exclusive to ordained members of a monastery. This is obvious from the importance of *bodhisattva* (菩薩) in *Mahāyāna*. A bodhisattva is one who has attained *bodhi* (悟) yet remains among ordinary people in order to liberate (解脱; vimokşa) people from suffering (苦; duhkha) by making them enlightened. The second movement important for Ch'an/Zen is development of *Mādhyamika* school (中観派) which was founded by Nāgārjuna (竜樹) in the second century. *Mādhyamika* school is important for Ch'an/Zen because it developed the idea of 空 (śūnyatā) which became a character defining concept of Ch'an and Zen.

In China, Buddhism incorporated native Taoism and Confucianism. In Japan Buddhism absorbed Japanese native religion and philosophy[7]. Absorption and incorporation of foreign ideas into Buddhism means that there was no guarantee for contents of 経 (sūtras) and 律 (vinayas) to be genuine teaching of Gautama Buddha. Ch'an argued that studying, memorising and chanting of 経 (sūtras) and 律 (vinayas) should be rejected because they are unlikely to be true teaching of Gautama Buddha, and therefore there is no guarantee that studying, chanting and memorising them would ever help people to attain 悟 (bodhi; the enlightenment). Instead of chanting, memorising and studying of 経 (sūtras) and 律 (vinayas) Ch'an favoured sitting meditation the way Buddhism was originally practised. Gautama Buddha himself rejected the idea that true understanding or the

[7] In Japan there are more philosophies and religions other than Shintoism (神道). Shintoism is merely a formalised Japanese pantheism

enlightenment can be obtained by studying religious texts called Vedas[8]. Gautama Buddha believed that true understanding comes only from within. Moreover he believed that the true understanding or the enlightenment cannot be put into words and cannot be passed onto others. To attain the enlightenment, one has to mediate rather than studying texts. Ch'an's teaching therefore, is based solely on sitting meditation, the way Gautama Buddha (then Siddhartha Gautama) attained the enlightenment. In fact the word Ch'an was Chinese translation of Sanskrit word "dhayna" (meditation). Zen's rejection of texts and favour of meditation is illustrated by Snelling as follow:

> Ch'an was about a return to essentials. All the teachings, texts, practices, code of morality and behaviour, etc. etc., that sprang up around the basically simple teaching of [Gautama] Buddha were intended as aids to progress *beyond*: to Enlightened. But as the years went by, the diligent practitioner might become attached and trapped in them. Just as the bodhisattva Manjushri wields his Sword of Wisdom to summarily slice through the net of delusions, so the impulse behind Ch'an was to sweep all the training paraphernalia of Buddhism aside and to zero in on the heart of the matter: the direct insight that transformed Siddhartha Gautama into the Buddha beneath the Bodhi Tree at Bodh Gaya.[9]

This attitude toward written texts is symbolised by a popular subject of 墨絵 (sumi-e; monochromatic ink painting), a Zen master tearing up a roll of sutras. This does not, however, mean Ch'an practitioners did not study 経 (sūtras) and 律 (vinayas) at all. In fact many Ch'an practitioners were deeply familiar with these texts. The Ch'an/Zen practitioner studies texts for their instrumental value. They considered 経 (sūtras) and 律 (vinayas) as 論 (abhidharmas). 論 (abhidharmas) are commentaries on 経 (sūtras) and 律 (vinayas) created by

[8] Vedas are Sanskrit texts of Hinduism dated around 1200 B.C. There are four collections of vedas; Rig Veda, Yajur Veda, Sāma Veda and Atharva Veda.
[9] Snelling, John. (1987), *The Buddhist Handbook*, (London; Century Hutchinson Ltd.), p.157.

followers of Gautama Buddha. In other words, Zen practitioners regards the texts not to be the original teachings of Gautama Buddha but commentaries written by his followers. Zen often draws a parallel between texts and a boat to illustrate the role of 経 (sūtras), 律 (vinayas) and 論 (abhidharma). Suppose I want to cross a river to get to the other shore. To cross the river, I need a boat, but, once I crossed the river the boat is no longer required. In the same manner, Ch'an considered 経 (sūtras), 律 (vinayas) and 論 (abhidharma) to be useful instruments, which guide those who seek the enlightenment to the right direction, but texts do not contain the ultimate knowledge of the enlightenment.

The second change which Ch'an aimed to reject was religionisation of Buddhism. Until the birth of Ch'an, Buddhist teaching had been progressively religionised. The religionisation of Buddhism can be understood from three facts: 1) anthropomorphisation of Buddhist concepts, 2) the deification of Gautama Buddha and bodhisattvas, and 3) the inclusion of many saints and gods of native religions as bodhisattas. Anthropomorphisation of philosophical concepts was common practice in order to introduce complicated ideas for popular consumption. To make complicated ideas available to common people, the ideas were attributed to gods, dainties and other mythical beings in folklore or mythology of ordinary people. This was common practice employed by not only Buddhism but also by other religions and philosophy. For example, in Brahmanism, all encompassed ultimate reality Brahman (梵) is often represented in a statue of a god. In principle, however, Brahman cannot be expressed in any form humans can comprehend, because whatever form or description we use is limited and it cannot express the all encompassed ultimate reality. In Buddhism, there are many examples of anthropomophisation. To give an example, there is a story Gautama Siddhartha[10] fought against temptations created by a demon[11] named Māra and his daughters (*Ratī*, *Aratī* and *Trsnā*). Etymologically māra means death, Ratī is delight (pleasure), Aratī is discontent and Trsnā is craving. The story represents a concept that the enlightenment is overcoming the fear of death and no longer be controlled by the pursuit of delight and craving or the feeling of discontentment.

[10] Gautama Siddhartha was a personal name of Gautama Buddha before he attained the enlightenment (bodhi).
[11] Technically Māra is one of deva (god or supernatural being)

The deification of Gautama Buddha and bodhisattvas is apparent from the fact that Buddhists worship sculptures of Gautama Buddha and bodhisattvas in the same manner as to worship religious idols. People worship Gautama Buddha and bodhisattvas because they believe that they are superhuman with supernatural abilities. Ch'an/Zen believes that Gautama Buddha and bodhisattvas were neither superhuman nor sons of God, so that worshipping them does not help people to attain 悟 (bodhi; the enlightenment). The word 仏陀 (buddha) simply means one who has attained 悟 (bodhi; the enlightenment) or one who possesses 智慧/般若[12] (prajñā, the ultimate knowledge). The word 仏陀 (buddha) is not a *proper name* but it is a *kind name*[13], it denotes not only the founder of Buddhism, Gautama Buddha, but also others who have attained the enlightenment. This means anyone can become 仏陀 (buddha). I will discuss this later in more detail, but to state briefly, 悟 (bodhi; the enlightenment) does not make an individual sacred or divine (i.e. it does not make an individual superior or above ordinary people), and it does not grant any supernatural power. Above all, Ch'an/Zen rejected an idea that worshipping those curved figures would help people to attain the enlightenment. There is a famous Zen story about a conversation that took place between a Zen master and his pupil. When they were sheltering in an abandoned temple in the middle of winter, the pupil was astonished to see the master chopping a statue of Buddha and using it as firewood. The master sensed his pupil's surprise and told him that the statue is just a piece of wood and has no supernatural power. Moreover, even if it has a spirit of Gautama Buddha, he would be happy to provide warmth to his followers.

In order to introduce Buddhism, Buddhist ideas were not only anthropomorphised and compared to native gods and sages, but also it absorbed native religion and philosophy that had already existed before the arrival of Buddhism. Before Buddhism was imported, China had 道教 (Taoist) and 儒教 (Confucianism), Japan had 神道 (Shintoism). These religions/philosophies had

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[12] Both 般若 and 智慧 denote the same Sanskrit word *prajñā*. The former is a phonetic translation whereas the latter is a semantical translation of Sanskrit term *prajñā*.

[13] Proper name is a name designated to one specific individual or individual object, such as "Bertland Russell" or "Ludwig Wittgenstein". Whereas a kind name refers to a certain group or a member of the group, such as "apple", "mammal" and so forth.

their own sages and pantheistic gods, which native Chinese and Japanese worshipped. Buddhism incorporated these gods and mystical figures as 菩薩 (*bodhisattas*). The merger of Buddhism with native religions helped Chinese and Japanese people to accept Buddhism, but it also altered Buddhism. By incorporating those native gods and sages into its teachings and presenting them as 菩薩 (*bodhisattas*), it was natural for Chinese and Japanese to worship 仏陀 (*buddha*) and 菩薩 (*bodhisattas*) in the same manner they worship their native sages and gods.

Ch'an/Zen rigorously rejected the canonisation and religionisation of Buddhism, because such moves lead to dogmatisation of Buddhist teaching. Ch'an/Zen believed that Buddhist teachings are not dogmas or articles of faith that have to be blindly accepted at the cost of suspending reason, critical judgement, common sense or experience. One should not accept everything that is said in texts, instead, one should only accept what he himself comes to conclude as a result of meditation. As the result of employing such attitudes, Ch'an/Zen rejected many ideas and beliefs that form the Popular Buddhism, such as reincarnation, Karmatic causation and rebirth, life-after-death, existence of heaven and hell, superhuman power of buddhas and bodhisatta, existence of mystical beings such as 餓鬼 (pretas; evil ghosts), 死魔 (māra; demons), 天 (devas; gods) and 阿修羅 (asuras; titans). I will explain throughout the thesis why Zen rejects these ideas. Ch'an/Zen combated dogmatisation of Buddhist teaching not only by rejecting texts in favour of meditation, but also by introducing rationalisation. The rationalisation Ch'an/Zen employed is different from the rationalisation employed in western philosophy. I believe Because Ch'an/Zen employs rational process incomparable or alien to western philosophy, Ch'an/Zen is often regarded by western academics as irrational or anti-analytical. I will explain the rationalisation Zen employs in Chapter Three. Because Ch'an/Zen rejects dogmatisation and applies the rationalisation, it should be considered as a philosophy and not as a religion. This is where Ch'an/Zen differs from the Popular Buddhism. The Pupular Buddhism has continued to dogmatise and religionise its teaching, meanwhile Ch'an/Zen resisted such movements. This is why Ch'an and Zen must be distinguished from the Popular Buddhism that is an article of faith. Some

readers may object that not all forms of Buddhism have religious tendency (i.e. Ch'an and Zen are not only philosophical Buddhism). In fact, Buddhism which is academically studied employs rationalisation and rejects the religious aspects of Buddhism. The reason I concentrate on Zen is because academic Buddhism is too diverse to cover in this thesis, and Zen is unique and different from other branches of Buddhism.

Despite its intention Ch'an/Zen failed to go back to the original teaching of Gautama Buddha. Ch'an and Zen are different from the original teaching of Gautama Buddha, because, as I mentioned, Buddhism, Ch'an and Zen were all influenced by foreign cultures, philosophies and religions. In fact, some scholars suggest that Ch'an/Zen was influenced more from 道教 (Taoism) than from Buddhism. Because of this, in order to explain Zen, I believe Zen has to be explained in a much wider context of eastern philosophy than just Buddhism as such. This thesis, therefore, uses not only Buddhism texts but also refers to various Taoism, Confucianism Shintoism and other texts.

III: Modern Zen

One thing I have to make clear here is that Zen presented in this thesis is not commentary or interpretation of classic Zen. It is modern Zen inspired not only by classic Zen but also by western and eastern philosophy, science, psychology, martial art and so forth. Some may argue what I considered as modern Zen should not be titled as Zen, because it does not represent Zen as a whole, and also because in some places it contradicts with Zen's traditional views. I would dismiss such criticism on three accounts; 1) Zen is not a philosophy of the past but is and has to be a living and breathing philosophy which evolves with the ever-changing environment, 2) Zen is not a single idea, but it is an aggregate of various and often conflicting ideas, and 3) Zen's aim is to eliminate false ideas or views in order to liberate ourselves from 苦 (duhkka, suffering).

Zen is a dynamic living philosophy and not a static philosophy of the past. Zen continues to develop and expand by absorbing modern ideas. Social, political or economical environments we currently live in are different from the time in which those historical texts were written. Since the ultimate aim of Zen is to

liberate (解脱; vimokṣa) people from suffering (苦; duhkha) in an ever-changing environment, Zen has to evolve as our surroundings changes. There is a difference between presenting modern living philosophy and philosophy of the past. If one presents philosophy of the past, such as Locke's philosophy, one cannot bring in new ideas or expand beyond what Locke wrote. If, on the other hand, one pursues modern philosophy, he can develop and produce new ideas. Those who engage with modern philosophy can invent their own ideas based on both past literatures and current knowledge so that there is no limit or horizon to restrict the expansion of their ideas. Zen this paper portrays is not a philosophy of the past, but a living and breathing philosophy which I believe to liberate people in modern society from suffering. Such Zen may contain ideas that did not exist in the classic Zen or worse contradict with traditional views. This thesis concentrates on modern Zen and not the classic Zen because the latter may be irrelevant to the society which we live in today. Moreover, being trapped by past ideas is exactly what Ch'an/Zen aims to avoid. To borrow Snelling's terminology, this is my attempt to wield *Sword of Wisdom* to make Zen what it is supposed to be.

Secondly, the modern Zen is still Zen, even though it may not be consistent with the classic Zen, because Zen is an aggregate of ideas and it is not a unified single idea. It is the same way *rationalism* is an aggregate of various philosophical ideas and inconsistencies exist among them. For example, Descartes' philosophy belongs to rationalism, but it does not represent rationalism as a whole, since other rationalists such as Spiniza and Leibniz opposed to some of Descartes' ideas. The relation between Zen as a whole and the modern Zen and the relation between rationalism and Descartes' philosophy are that of a member and set. A member of a certain set does not have to be representative of every member in the set, since members of a set do not have to be identical to each other. For example, consider a set of numbers [1,4,9,16,25...n^2]. By being square of natural number, 16 is a legitimate member of the set, but the number 16 is not equal to any other numbers in the set, and it does not share properties other than being a square of a natural number. In the same way, what I consider as the modern Zen is still Zen since it shares certain characteristics with other forms of Zen, but it does not mean it entirely agrees with other forms of Zen philosophy.

Thirdly, the primal aim of Zen is not the acquisition of truth but the elimination of suffering by discarding false understanding of ourselves and reality. There is one fundamental difference between western and eastern philosophy. Western philosophy emphasises the acquisition of truth or expansion of human knowledge. The very name philo-sophia (love of knowledge) illustrates this point. Whereas for eastern philosophy/religion such as Hinduism, Buddhism, Taosim, and Ch'an/Zen, the aim of philosophical enquiry is liberation from 苦 (duhkha; sufferings) that accompanying our lives. For eastern philosophies and religions, attainment of knowledge is merely a means to achieve liberation from 苦 (duhkha). In Buddhism, three core doctrines [四諦 (catur-ārya-satya; four noble truth), 十二因緣 (twelve pratitya-samtpādas; dependent origination) and 五蘊 (five skandha; five elements)] all indicate that suffering derives from our ignorance and misunderstanding of the reality. Therefore by eliminating miscomprehension we can liberate ourselves from suffering. In this sense, the modern Zen I present in this thesis is Zen, because it aims to find the source of our ignorance and misunderstanding, in order to liberate ourselves from suffering. I will examine in Chapter eight how Zen ideas would helps to liberate ourselves from suffering.

IV: Methodology

So far I have defined what I aim to illustrate in this thesis. I now would like to turn to an issue of how I defend the plausibility of modern Zen. To test the plausibility of my Zen ideas, I will divide philosophy into a conclusion and an argument. Instead of using Zen argument to reaches the conclusion, I will use arguments from western philosophy and science to reach Zen conclusions. In other words, I pick up only the conclusion and not argument from Zen, and try to explain and defend plausibility of Zen conclusion in a fashion which western readers are familiar with, using western philosophical arguments. This is significantly different from traditional approaches to Zen and other eastern philosophical ideas. Most studies on Zen and other eastern philosophies normally take the following two kinds of approach. One is analysing eastern argument and conclusion within the domain of eastern philosophy. This approach is popular for

historical analysis of how certain ideas have derived and an attempt to justify an interpretation of certain texts and concepts. Although this approach gives an in-depth analysis of eastern philosophy, it is not suitable for the purpose of this thesis. Because eastern concepts, terminology and manner of proceeding arguments are vastly different from that of western philosophy, this approach would alienates western readers who are not familiar with eastern philosophy. The second approach is a comparative study of eastern and western philosophies. It explains and defends eastern argument and conclusion by indicating similarities they possess to the western argument and conclusion. In Japan, Buddhist philosophy has been often compared to German philosophy from historical reasons. Firstly, Germany had already been exposed to and influenced by eastern philosophy thanks to Schopenhauer[14] whose work was strongly influenced by ancient Indian text of Upanishad. This made it easy to carry out comparative studies. Secondly, in 1860s, many Japanese academics were sent to Germany to study medicine, science, philosophy and other academic subjects, so that Japanese academia were exposed to German philosophy. Although this approach makes eastern philosophy accessible to people who have no prior knowledge, I consider this to be inappropriate for the purpose of this thesis. This way of defending eastern argument and conclusion makes the plausibility of eastern ideas to be heavily depended upon western arguments. This puts eastern philosophy in danger of being denied because of its association to failed western philosophy. It is like the former is piggy-bagged onto the latter, so that if the latter fell, it takes the former with it. This is acute especially because eastern philosophers tend to compare Zen to classic western philosophies rather than to modern western philosophy that are currently regarded as plausible. Philosophy and science have progressed since classic literatures were written. Therefore some premises classic arguments are based upon may no longer be valid. With development in philosophy and science since classic literatures were written what was once a

[14] Schopenhauer's work especially vol.4 chapter 53-71 of his *The World as Will and Representation* is dedicated to Indian philosophy. He learned eastern philosophy from the orientalist Frederic Mayer and his understanding is based on Latin version of Upanishad translated by DuPeron from Persian version. However, his understanding of Indian philosophy was sketchy and contain many misunderstanding due to the fact that the Persian version and subsequent Latin version were inaccurate translation.

credible argument may no longer be convincing.

Another thing I will avoid in this thesis is to rely heavily upon classic Pāli and Sanskrit texts. Many literatures written about Buddhism or Zen aim to prove the legitimacy of their claims by demonstrating their consistency with various Pāli or Sanskrit texts. I agree that it is useful to a certain extent to carry out an historical analysis of how Ch'an/Zen ideas were developed. I, however, believe that such approach to Zen is problematic on three accounts. One is that these approaches are exactly what Ch'an/Zen opposes. Those scholars who try to explain Ch'an/Zen referring to classic eastern literature are as much trapped in paraphernalia as pre-Ch'an Buddhists. I therefore believe that relying solely on classic arguments is a wrong way to defend plausibility of Zen. Secondly, as I mentioned earlier, Zen is neither dogma nor an article of faith, it is what each individual concludes or believes from his or her own reasoning. I refer to past literatures to explain where the modern Zen comes from but I avoid as much as I can the use of past literatures to boost its plausibility. Thirdly, trying to understand Zen by studying texts in chronological order (from Sanskrit or Pāli cannons to Chinese and Japanese texts) leads only to confusion. As I have mentioned above, Zen is not the original teaching of Gautama Buddha, but mixture of Gautma Buddha's teaching, ideas of his followers, Hinduism, Taoism, Confucianism Shintoism and so forth. Moreover, Sanskrit or Pāli texts were often misunderstand or misinterpreted by the Chinese and Japanese. As a result, Chinese and Japanese texts that Ch'an/Zen derives from are often inconsistent or incoherence with older Pāli and Sanskrit texts. It is, therefore, a mistake to try characterising Zen based on older texts. I believe a better way to understand Zen is to concentrate on recent literatures that are more relevant to current Zen. This is why I rely mainly on Chinese and Japanese texts, or Chinese/Japanese interpretation of Sanskrit texts, and only use Pāli and Sanskrit texts as references.

I believe my approach of rejecting classical arguments of Zen Buddhism is possible, and using it, I hope I can make Zen understandable to western readers who are not familiar with eastern philosophy. If my approach were to be successful, readers would understand that Zen is not so different from the western way of thinking. Moreover, this is throwing Zen in the deep end, rather than

testing its plausibility in the comfort of its own home ground. Using such a method, the plausibility of Zen can be truly examined. This western approach to Zen would, I believe, not only help Zen to be accessible to western readers, but also gives fundamental structures to Zen philosophy which is notoriously elusive as Zen can lack proper structure and consistency.

V: The structure of this thesis

Although there are various ways to explain Zen's metaphysical view, in this thesis I will do so using the idea called 空 (śūnyatā), more specifically 空 (śūnyatā) of 名色 (nama-rūpa). The Part One defines both 空 (śūnyatā) and 名色 (nama-rūpa) using western epistemology. Because of the nature of the idea 空 (śūnyatā), precise aims and methodology of this thesis cannot be fully explained until the end of the Part One.

Once 空 (śūnyatā) of 名色 (nama-rūpa) is defined, the rest of the thesis are applications of the idea upon various metaphysical topics. It is easy to prove plausibility of Zen by choosing a specific aspect of Zen that is conveniently similar to western philosophy. This kind of approach, however, does not prove Zen to be equally plausible to its western rivals. It actually fuels the common perception of Zen as an inconsistent collection of anti-analytical beliefs. To combat this common perception of Zen, I aim to apply 空 (śūnyatā) of 名色 (nama-rūpa) upon as diverse metaphysical topics as possible. Because there is a word limit to the thesis, I will concentrate on the most fundamental topics: universal, particular, space, time, substance, causation and determinism (sorts of topics covered in an introductory book of metaphysics).

Chapter Three and Four make up Part Two titled "空 (śūnyatā) of Intrinsic Divisions", which deals with two kinds of divisions that we used to make sense of our experience and knowledge. The two kinds of divisions are division between different classes, kinds, species and categories and division between individuals. Chapter Three looks into the objective legitimacy of qualitative divisions that natural kinds suggest. Chapter Four questions the legitimacy of numerical identity of an composite object. The Part Two aims to conclude that the reality is beyond

binary discrimination (分別; vikalpa) of A or not-A.

Topics the thesis looks into in Part Three are space (three-dimensional space), time, substance and causation. These topics are not necessarily covered by classic Zen literatures, but I provide how the concept of 空 (śūnyatā) can be applied to these topics. Chapter Five borrows arguments from modern physics to elucidate the idea that reality may not be spatio-temporal. We just perceive the world to be spatio-temporal without reality actually being spatio-temporal in its true nature. Chapter Six attends to the question of what sort of substance is or are there. Classically the question of substance concerns mental substance and physical substance. If the concept of 空 (śūnyatā) is taken seriously, Zen believes neither mental substance and physical substance are genuine substance, but they are merely two distinct ways for us to comprehend substance. Non-spatio-temporality of the reality demonstrated in Chapter Five and Six leads to the concept of causation different from our commonly held belief. Chapter Seven examines this concept of causation according to 空 (śūnyatā). As I mentioned earlier, the aim of this thesis is to make Zen way of life or behaviour understandable by clarifying the underline metaphysical view. Chapter Eight investigates how Zen's metaphysical ideas influence the ordinary way of life and ethics, mainly concentrate on the liberation (解脱; vimoksa) from 苦 (duhkha; suffering). Those whose interest in Zen is purely metaphysical may ignore Chapter Eight, but my purpose of writing this thesis is actually to show how metaphysical ideas influence and improve our everyday life. I hope in the future I will have an opportunity to expand topics dealt in Chapter Eight to write a thesis about the everyday application of Zen metaphysics.

VI: Concerning language

As readers may have noticed that I use a particular way of stating Buddhist and Ch'an/Zen terms, which is a combination of Chinese semantic characters and their Sanskrit equivalent. Most English books and articles written on Buddhism or on Ch'an/Zent use Romanised Sanskrit, Pāli, Chinese or Japanese, without Chinese semantic characters. In my experience these widely-used ways of describing Ch'an/Zen concepts are problematic. Even though Ch'an/Zen terms

were etymologically originated in Pāli and Sanskrit words, they include uniquely Chinese and Japanese nuance. This is, as we have seen, due to influences of native philosophy and religions of China and Japan upon Buddhism and also to misinterpretation and miscomprehension of precise Buddhist terms. Therefore it is necessary to distinguish original Pāli or Sanskrit words and phrases from Chinese/Japanese interpretations of words and phrases. This is why I cannot use Romanised Sanskrit or Pāli alone to describe Ch'an/Zen concepts. The commonly used alternative is to use Romanised Chinese or Japanese. This, however, creates inconveniences for Chinese and Japanese speakers. The first problem is that the same Ch'an/Japanese terms can be pronounced differently in Japanese, Cantonese Chinese and Mandarin Chinese. For example, 空, Chinese letter for śūnyatā is pronounced in Mandarin Chinese "kōng" and in Japanese "kuu". This means that I used "kuu", the Japanese pronunciation for 空 (śūnyatā), Chinese readers would experience great difficulties understanding what it is, and they may misapprehend concept I am referring to. The second problem of using Romanised Japanese is that pronunciations of different semantic characters are sometime identical in Japanese language. For example, 空 (emptiness), 食う (to eat), 腔 (cavities in the body), 鞚 (a bit for a horse) all shares the identical pronunciation, "kuu". Therefore if I wrote "kuu", Japanese readers would not understand which kuu I mean.

In order to overcome these problems, I use Chinese semantic characters for Ch'an/Zen concepts and Sanskrit or Pāli for the original meanings. For Chinese or Japanese readers, it may be practical to write Ch'an/Zen concepts using Chinese semantic letters, in order to distinguish them from original Sanskrit/Pāli meanings, but this creates a problem for those who do not read Chinese characters. This forces me to use Sanskrit words to accompany Chinese characters. This helps western readers as well as Chinese and Japanese readers. For western readers, this creates a compatibility with texts available in the west. Most books and articles on Buddhism use Sanskrit or/and Pāli. Especially Buddhist or Eastern philosophy dictionaries available in the west use headings with Sanskrit or/and Pāli. For Chinese and Japanese readers, accompanying a Chinese letter with a Sanskrit equivalent clarifies its origin.

To summarise, the Buddhism concept in general is written with Romanised Sanskrit. And when applicable, they are accompanied by Chinese/Japanese translation in Chinese character. Ch'an/Zen concepts are written with Chinese semantic character followed by Sanskrit. But in some occasions, when I want to emphasise a meaning, I will write English accompanied by either Chinese semantic characters or/and Romanised Sanskrit. When I mention a Japanese or Chinese concept that has no Sanskrit equivalent, I use either Romanised Chinese or Japanese pronunciation. In order to distinguish Japanese and Chinese pronunciation, I use Ch; for Chinese and Jp; for Japanese.

Names are particularly difficult. Until very recently, in China and Japan, all names of Asian philosophers were written using Chinese characters and pronounced differently in China and Japan. Therefore it is inevitable to include names in Chinese characters. I will try as much as I can to include pronunciation in both Japanese and Chinese. Names of contemporary authors are written using Romanised pronunciation according to ISBN catalogues and Philosopher's Index.

It has to be noted again that although for western readers Sanskrit words I use to describe Zen concepts contains Chinese or Japanese nuance and not their original Sanskrit meanings. The same thing is applicable to names of texts. For example "*Madhyamaka-śāstra* (『中論』)" and 『中論』 (*Madhyamaka-śāstra*), the former is the original Sanskrit version whereas the latter is the Chinese translation of the same text (the latter may contains things that were not in the former).

Part 1

空 (Śūnyatā)

空 (Śūnyatā)

The basic metaphysical position of Zen can be summarised into one word 空 (śūnyatā; emptiness). Zen states that everything is 空 (śūnya; empty) and 空 (śūnyatā) is a fundamental characteristic of everything. 空 (śūnyatā) is the key to understand 四聖諦 (catur-ārya-satya; Four Noble Truth), 三法印 (tri-laksana; three marks of reality) and other concepts that define Zen in particular and Buddhism in general. The aim of this thesis is to present Zen's metaphysics by describing what we assume to be true aspects constituents of the reality such as particular, universal, substance, space, time and causation to be 空 (śūnya). In order to do so, Part One explains and defends the concept of 空 (śūnyatā) itself.

The concept of 空 (śūnyatā) is often studied within a narrow context of an Indian philosopher Nāgārjuna[1] (龍樹). In this thesis, however, I would define the term in a much wider sense. As Nakamura[2], Fujita[3], Kajiyama[4] and others repeatedly demonstrated, there is evidence that the idea existed in texts that predated Nāgārjuna. They argued that the idea had been gradually lost after Gautama Buddha's death till Nāgārjuna brought it back as a core concept of Buddhism. Moreover, Zen's idea of 空 (śūnyatā) derived from not only Buddhism but also 道教 (Taoism), so that it is a mistake to define the term only according to Nāgārjuna. These are why I would like to define the concept in much wider contexts than the way Nāgārjuna used.

It is difficult to define the full meaning of 空 (śūnyatā). There have been many failed attempts to capture its full meaning. The difficulties lay in the fact that 空 (śūnyatā) seems to embrace diverse views that can be interpreted as

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[1] Nāgārjuna 龍樹(South India; the second century C.E.) Although little is known about his life, it is generally accepted that he was one of the founders of Māhāyana school of Buddhism (大乗仏教). One of core literatures for Zen, *Prajñā-pāramitā Sūtra* (般若波羅蜜多心経) is said to be originated to him.

[2] Nakamura, Hajime.(1981), 『空 (上) 仏教思想 6』(*"Emptiness" Buddhist Philosophy Vol.6*), Part 2 "The historical origin". He discuss the concept 空 (emptiness) to be found in *Suttanipāta* verses 1065, *Theragāthā* verse395 and other texts predated Nāgārjuna.

[3] Fujita, Koutasu. (1982), 「原始仏教における空」("Emptiness in original Buddhism") in 『仏教思想 7』(*Buddhist Philosophy Vol.7*), (Tokyo; Bukkyou-shisou-kenkyu-kai).

[4] Kajiyama Yuichi (1992), 『空入門』 (Introduction to Emptiness), (Tokyo; Shunnjusha), Ch-1. He quoted *Suttanipāta* verses 756-757 and *Samyutta Nikāya* XXII, 95.15, to indicate that existence of the concept predating Nāgārjuna.

anti-realism, relativism, pragmatism and realism. How is it possible to combine these diverse views under a single concept? I believe that the answer lies in the role of 悟[5] (bodhi; the enlightenment) which implies the double standard that exists in Zen. For someone who has not attained 悟 (bodhi), 空 (śūnyatā) is a negative and sceptic concept that our mundane knowledge (愚癡; maho) does not reflect the way the world really is, or our inability to comprehend things as they are. Whereas for those who have been enlightened, 空 (śūnyatā) is a positive and productive concept which support a possibility for humans to attain 智慧 (prajña; the supreme knowledge). In my opinion, many attempts to define 空 (śūnyatā) have faced difficulties because they failed to recognise this double-standard and try to explain 空 (śūnyatā) in a single all encompassed definition. Since Zen for the unenlightened and Zen for the enlightened are like two sides of the same coin, it is not possible to paint them with a single stroke. It requires two separate strokes to cover the coin.

The first chapter explains and defends the negative sense of 空 (śūnyatā). By carefully analysing why the unenlightened are not capable to comprehend the reality, it is possible to understand what 悟 (bodhi) is and how the enlightened view the world. This is why I will use the first chapter to defend the negative sense of 空 (śūnyatā; emptiness) before explaining the positive sense in the second chapter.

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[5] I translate "bodhi" to Japanese as 悟 (satori) rather than 見性 (kenshou). The latter has strong Buddhism connotation whereas the former has much wider use and applicable to Taoism, Shintoism and other nonreligious concept. Since Zen is not pure Buddhism and had strongly influenced by native religion and philosophy of Far East, I feel appropriate to use the former.

1

Negative 空 (śūnyatā)

For the unenlightened, the statement "everything is 空 (śūnya; empty)" expresses epistemological scepticism that 愚癡 (moha), knowledge of the unenlightened, does not correspond to way the reality is. This is because Zen recognises everything the unenlightened experience or comprehend to be 幻 (māyā; illusion). There are many other terms which express this scepticism which the negative 空 (śūnyatā) implies. To list a few; our apprehension of the world is described as 顚倒 (viparyāsa) which is literally translated as "a wrong way of looking at things" or "seeing the opposite of what it really is". As a result, everything we experience or understand is 虛妄 (abhāta; false idea) and any theory we hold is 戯論 (prapañca; false theory). The problem of 幻 (māyā; illusion) is that not only do we not possess knowledge of reality as it anyway is, but we falsely believe our experience and knowledge to be genuine. For Zen, not understanding reality is not a serious problem. The serious problem is that we are not aware that we hold false ideas about reality. Zen thinks that this false belief in our ability to apprehend the reality is the cause of all 苦[1] (duhkha; suffering).

Buddhism traditionally explains how 幻 (māyā; illusion) and false belief arises using 縁起 (pratītya-samutpāda; the Dependent Origination) and 無我 (anātman; Non-Self). Unfortunately, these traditional explanations are not approachable to western readers who have no knowledge of eastern philosophy. I

[1] 四苦八苦 (shiku-hakku). Four kinds and eight kinds of suffering; Four fundamental kinds are 苦 (dukha) of 生 (jāti; to be born), 老 (jarā; aging), 病 (illness) and 死 (marana; death). In addition to the above four there are 怨憎会苦 (to meet someone whom one hates), 愛別離苦 (to parting from loved ones), 求不得苦 (to long for something one does not have) and 五取蘊苦 (to have attachment to five aspects of mind).

will, therefore, defend the negative 空 (śūnyatā) using two interwoven concepts that I found to be compatible with western philosophy; 流転 (samsāra) and 名色 (nama-rūpa). An argument for the epistemological scepticism of the negative 空 (śūnyatā) can be formulated as follows;

1) Our experience and knowledge is limited to the realms of 流転 (samsāra).
2) 流転 (samsāra) is composed of 幻 (māyā; illusion).

Therefore

3) All our experience and knowledge are 幻 (māyā; illusion).

名色 (nama-rūpa) is a key concept which explains and proves the above two premises, thereby it is a key to the negative sense of 空 (śūnyatā). It proves 流転 (samsāra) is everything we can comprehend, and it explains why we cannot apprehend things as they really are. Before analysing plausibility of each premise, let us clarify what 流転 (samsāra) and 名色 (nama-rūpa) are.

1.1.Definition of 流転 (samsāra) and 名色 (nama-rūpa)

1.1.1. 流転 (samsāra) and 寂滅 (nirvāna)

To understand what 流転 (samsāra) is, we have to look into its counterpart 寂滅[2] (nirvāna) as well. It is very important here to narrow down definitions of 寂滅 (nirvāna) and 流転 (samsāra), because there are diverse and often conflicting interpretations for the two.

As Tillich[3] pointed out, the interpretations of the two concepts by the Popular Buddhist are similar to the Christian idea of heaven and earth. Samsāra is regarded as earth where we, the unenlightened, live, whereas Nirvāna is heaven

[2] In Japanese and Chinese, *Nirvāna* can be translated either as 寂滅 (Jp; jakumetu) or 涅槃 (Jp; nehan). The difference between the two is that the former is semantical traslation whereas the latter is the phonetical one. For this reason, even though the latter is more commonly used, I employ the former in this thesis.

[3] Tillich, Paul, (1963), *Christianity and the Encounter of the World Religions*, (N.Y.; Columbia Univ. Press),

which is inhabited by the enlightened. One of the reasons to consider them to be heaven and earth derives from the Four Noble Truth (catur-ārya-satya; 四聖諦) and the Wheel of Life (bhāva-cakra; 輪廻). The first noble truth defines samsāra in terms of duhkha (苦; suffering); existing in samsāra is duhkha (suffering) or samsāra is the realm of duhkha. According to the Wheel of Life, an individual transmigrates from one being to the next in a continuous cycle of reincarnation according to karma (業) that is determined by moral conduct in the previous life[4]. This continuous reincarnation takes place in the realm of *samsāra*, so that we are stuck eternally in a continuous cycle of duhkha (suffering). The third and the fourth Noble Truth state that there is a way to escape from the continuous cycle of *dukha* (suffering). The only way to escape is the attainment of *bodhi* (悟; the enlightenment). *Bodhi* (bodhi; the enlightenment) liberates an individual from this world (*samsāra*) and transfers him to heaven (*nirvāna*).

Although this heaven-and-earth interpretation by the Popular Buddhism is widely accepted, it faces difficulty in explaining the life of Gautama Buddha. Gautama Buddha attained the enlightenment under the Bodhi tree at Bodh Gāya, yet rather than going immediately to heaven (nirvāna) he remained in this world (samsāra) to spread his teaching. In other words, he did not reach heaven (nirvāna) even though he attained bodhi (the enlightenment). In order to explain this inconsistency, the Popular Buddhism recognises two kinds of nirvāna; residual-nirvāna (sopādiśesa-nirvāna; 有余涅槃) and non-residual nirvāna (anupādiśesa-nirvāna; 無余涅槃). The former arose when he attained the enlightenment for the first time beneath the Bodhi tree. The residual nirvāna entitled him *prajñā* (智慧; the supreme knowledge) and guarantees him to go to the latter kind of nirvāna when his existence in samsāra was terminated. In other words, he did not reach the latter kinds of nirvāna till death at Kusinārā. Despite distinguishing two kinds of nirvāna, the heaven-and-earth interpretation is widely denied, since there is much literal evidence to state otherwise. For example, in

[4] A morally wrong conduct in the previous life results in reincarnated into a life as a creature of lower caste which is accompanied by the greater suffering.

Mādhyyamaka Kārikā[5] (中観荘厳論)

> Nothing of *samsāra* is different from *nirvāna*, nothing of *nirvāna* is different from *samsāra*. That which is the limit of *nirvāna* is also the limit of *samsāra*; there is not the slightest difference between the two.[6]

Also, *Lankāvatāra-sūtra*[7] (楞伽経) states that;

> Again, Mahamati, what is meant by non-duality? It means that light and shade, long and short, black and white are relative terms, Mahamiti, and not independent of each other; as Nirvana and Samsara are, all things are not-two. There is no Nirvana except where there is Samsara; there is no Samsara except where there is Nirvana; for the condition of existence is not of a mutually exclusive character. Therefore it is said that all things are non-dual as are Nirvana and Samsara.[8]

These statements clearly reject the popular Buddhist interpretation which sees nirvāna and samsāra as two distinct domains of heaven and earth. It is, however, too short-sighted to conclude that there is no difference at all between nirvāna and samsāra. As Loy correctly identified;

> ... there must be *some* difference between them, for otherwise no distinction would have been made and there would be no need for two words to describe the same state...There is only one reality – this world, right here – but this world may be experienced in two different ways. Samsāra is the "relative" world as usually experienced...

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[5] A text of later Madhyamaka school written by Śāntaraksita (寂護; 725-784).
[6] *Mādhyyamaka Kārikā*, XXV, 19-20.
[7] One of important sūtras in Mahāyāna Buddhism. One of its teaching "一字不説 (not a word was preached)" is believed to influenced Ch'an/Zen's idea that the ultimate truth cannot be put into a word.
[8] *Lankavatara Sutra*, II,28

Nirvāna is the world as it in itself...[9]

流転 (samsāra) is "a relative reality" or "a human world[10]" which we experience as reality and it has to be distinguished from 寂滅 (nirvāna), the mind-independent reality. It is relative because it is mind-dependent and mind-coordinated. What we experience as reality is relative to us because it is an image or a reflection of the mind-independent reality upon our minds, so that it cannot exist without anyone or anything perceiving or experiencing it. This is why 流転 (samsāra) is often described as 有為 (samskrta) "conditioned" or "created" by us the percipient. 寂滅 (nirvāna) is, on the other hand, the mind-independent reality since it does not ontologically depend upon existence or operation of the mind (i.e. it exists regardless of whether or not there is anyone or anything observing or experiencing it).

This interpretation of 寂滅 (nirvāna) and 流転 (samsāra) as the mind-independent reality and relative reality is compatible with both the textural rejections of the heaven-and-earth interpretation and the necessity to distinguish the two. 寂滅 (nirvāna) is not the next world distinct from 流転 (samsāra). 寂滅 (nirvāna) and 流転 (samsāra) are both here and now. Yet it is practical to distinguish them since Zen thinks the way we experience the world is not necessary the way the mind-independent reality anyway is. For 流転 (samsāra) is not necessary an accurate representation of 寂滅 (nirvāna), we must recognised them to be distinct.

I admit that Zen's beliefs on the existence and the role of 寂滅 (nirvāna) are controversial. Firstly, there is no conclusive reason to reject solipsism, the idea that there is no mind-independent reality at all. In fact some Buddhists in early Yogācāra School[11] endorsed a solipsistic principle of "vijiñanavāda" (cognitive representation only), there is no mind-independent reality beyond or behind the

[9] Loy, David. (1983), "The difference between *samsāra* and *nirvāna*," in *Philosophy East and West*, vol.33, p.355.

[10] Cooper, David (2002), *The Measure of Things*, (Oxford; Clarendon Press), p.1

[11] Yogācāra school is one of the oldest branch of Buddhism that emerged around the fourth century. Among many philosophers in the school the solipsistic idea can be found in Maitreyānātha, Asaṅga in his early works and Vasubandhu.

world which we experience. Although it is traditional to interpret vijiñanavāda as a solipsistic concept, currently there are scholars[12] who take Yogācāra Buddhism to be epistemological idealism[13]. At least this thesis is about Zen and not the Yogācāra school, so that the discussion of whether the latter kind of Buddhism is solipsism or epistemological idealism is not important here. The fact that only Yogācāra school is advertised to question the existence of the mind-independent reality, proves the point that other schools of Buddhism, including Zen, do not even question the existence of the mind-independent reality.

Even if we assume the existence of the mind-independent reality (寂滅; nirvāna) beyond and behind the relative reality (流転; samsāra), there is a further problem. It is possible that the latter has nothing to do with the former. Such possibility is illustrated by technological advances in virtual reality or computer generated imaging. In virtual reality, what we experience as reality is totally fabricated, so that whatever we experience is not at all related to an actual surrounding. Again Zen does not expressively deny such possibility. Zen simply assumes the connection between 寂滅 (nirvāna; the mind-independent reality) and 流転 (samsāra; the reality as we comprehend). I will examine Zen's idea of how 流転 (samsāra) arises from 寂滅 (nirvāna) in the next section. Regarding the existence of 寂滅 (nirvāna; the mind-independent reality) and its connection to 流転 (samsāra), I can only leave them as two unfounded yet necessary assumptions, because alternatives lead to a philosophical graveyard. If there is no mind-independent reality behind and beyond the reality as we comprehend or/and what we experience or comprehend has nothing to do with the mind-independent reality, then all philosophical and scientific enquiries aiming to understand the absolute truth are ultimately pointless.

Once we establish 流転 (samsāra) as the relative reality and 寂滅 (nirvāna)

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[12] King, Richard, (1994), "Early Yogācāra and its relationship with the Madhyamaka school," in *Philosophy East and West*, Vol.44, p.659-683. Hirabayashi & Iida, Shotaro (1977), "Another look at the Mādhyamika vs. Yāgācara contraversy concerning existence and non-existence", in Lancaster, L. (ed.) (1977), *Prajñāpāramitā and Related Systems.* (Berkley, U.S.A.; Univ. of California Press), p.341-360.

[13] It gives no mention of whether there is or there is not the mind-independent reality beyond and behind what we perceived as reality. It is the idea that all we can experience and have knowledge of are relative reality, reality which is mind-dependent, mind-coordinated and mind-cooperated.

as the mind-independent reality, it is easy to draw parallel between the negative 空 (śūnyatā) and western scepticism. Western scepticism is composed of two premises. The first is that we have no direct contact with the external world but only with mental image of the world. The second is the mental image does not necessarily reflect the mind-independent reality as it is. Because there is no adequate justification to believe that mental-representation actually corresponds to the mind-independent reality, we cannot make any claim to know the mind-independent reality. The same argument can be formulated using Zen's terminology as followed;

1) Our experience and knowledge are limited to 流転 (samsāra), and not 寂滅 (nirvāna).
2) 流転 (samsāra) does not necessary reflect the way the 寂滅 (nirvāna) actually is.
   Therefore
3) We cannot claim to possess knowledge of the way 寂滅 (nirvāna) is.

As I stated at the beginning of this chapter, Zen explains these claims using 名色 (nama-rūpa). We have no access to 寂滅 (nirvāna) because our experience and knowledge are limited to 名色 (nama-rūpa). 流転 (samsāra) does not accurately reflect 寂滅 (nirvāna) because of what I call "the tyranny of 名色 (nama-rūpa)". So what is 名色 (nama-rūpa) and how does it explain the above two premises? I will define the term 名色 (nama-rūpa) according to Zen psychology on the process of how experience and knowledge arise.

1.1.2. 名色 (nama-rūpa)

According to Zen, all our experience and knowledge originate in 六根 (six indriyas). They are 眼根, (cakşus-indriya; eyes), 耳根 (śrotra-indriya; ears), 鼻根 (ghrāna-indriya; nose), 舌根 (jihvā-indriya; tongue), 身根 (kāya-indriya;

body) and 意根 (mana-indriya; mind). 根 (indriya) is often translated to English as "sense organ", but since it includes 意 (mana; mind), the term should be understood as "origin from which all our experience and knowledge arrive". The inclusion of 意 (mana; mind) as one of the six origins can be easily understood by the fact that not all experience and knowledge derives from the five sense organs. For example, memory, emotion and imagination do not necessary require interaction between the five sense organs and the external world. From 六根 (six-indriyas) arise six corresponding kinds of bare sensation called 六識 (six-vijiñānas); they are 眼識 (cakşus-vijiñāna; visual sensation), 耳識 (śrotra-vijiñāna; auditory sensation), 鼻識 (ghrāna-vijiñāna; olfactory sensation), 舌識 (jihvā-vijiñāna; glossal or gastoric sensation), 身識 (kāya-vijiñāna; tactile or bodily sensation) and 意識 (mana-vijiñāna; inner sensation). These 六識 (six vijiñānas) are distinguished not only by their sources but also by six different kinds of attributes they correspond, that are known as 六境 (six vişayas). They are 色境 (rūpa-vişayas; shape, form and texture[14]), 聲境 (śabda-vişayas; sound), 香境 (gadha-vişayas; smell), 味境 (rasa-vişayas; taste), 觸境 (sparśa-vişayas; texture and shape) and 法境 (dharma-vişayas; state of mind). According to Zen, what we directly be aware of are not these 六識 (six vijiñānas) but something that are called 五蘊 (five skandha). 蘊 (skandha) is commonly translated as "aggregate" or "constituent" of an individual, and normally associated with the idea of 我 (self; ātman). The close inspection, however, reveals that it is also what we are directly aware or conscious of. The first of the five is 色蘊 (rūpa-skandha) which is consciousness or awareness of the external world that arises *mainly* from interaction between the five sense organs and the external world. Other four 蘊 (skandha), on the contrary, are directed toward inner state which *mainly* originate from the mind (意; mana). The latter four are 受蘊

[14] The Chinese/Japanese character 色 (rūpa) literally means "colour" but it is too narrow for the its usage. It is also often translated as "form", but this translation applied more to 色蘊 (rūpa-skandha) which will be discussed shortly. As one of 境 (viśaya) it referred to simple visual attributes such as "colour" and "shape". This point is emphasised by Vasubandhu (1981), *Abhidarmakośa and Bhāşya*,(Varanasi; Bauddha Bharati Publication), I, 10 a.

(vedaña-skandha; emotion), 想蘊 (samjñā-skandha; imagination), 行蘊 (samskāra-skandha; motivation) and 識蘊[15] (vijñāna-skandha; analytical thinking or apprehension). I have to emphasise the word "mainly" here because five sense organs can give rise to not only 色蘊 (rūpa-skandha) but also the latter four kinds of 蘊 (skandha). For example, the smell of certain perfume can trigger emotion and the memory of a person. In the same way our state of mind influences how we perceive external world. We do not just see colour, but we also experience some emotion or idea with visual experience. It is easy to understand that colours often have some emotional attachment. For example, we perceive pink to be a girly colour, bright pastel colours are cheerful while dark blue is a calm colour.

名色 (nama-rūpa) is the object or content of these 五蘊 (five skandhas). In other words, 五蘊 (five skandhas) are experience of 名色 (nama-rūpa). The relation between the two is similar to that of 六識 (six vijiñāna) and 六境 (six viṣaya). As we have seen earlier, the former is the perception of the latter. For example, 耳識 (śrotra-vijiñāna; auditory experience) is experience of 聲境 (śabda-viṣaya; sound). In the similar way, 五蘊 (five skandha) are experience of 名色 (nama-rūpa). 蘊 (skandha) refers experience itself whereas 名色 (nama-rūpa) is object or content of such experience.

The difference between 名色 (nama-rūpa) and 六境 (six viṣayas) is subtle yet very important for understanding Zen psychology. The fundamental difference is that what we directly experience and have knowledge of is 名色 (nama-rūpa) and not 六境 (six viṣayas), or we can only comprehend 六境 (six viṣayas) as or through 名色 (nama-rūpa). For example understanding the spherical shape of an object can derive from two different kinds of sensory experience. I can attain the visual attribute (色境; rūpa-viṣayas) of the object by looking at it, or attain the

[15] As some readers may noticed that 識 (vijiñāna) appears again as one of five 蘊 (skandha). Meanings of the term have to be distinguished according to in which context the word 識 (vijiñāna) is used. The common definition of the term is in the context of 蘊 (skandha) is as discriminative from of knowledge or knowledge that derives as result of discriminative analysis. Whereas in the context of 六識 (six-vijiñānas), it means bare sensation or state of mind which we cannot directly be conscious of.

tactile attribute (觸境;sparśa-viṣayas) of the object by touching it. Despite differences in sensory attributes, resulting 名色 (nāma-rūpa) are one and the same, namely that the idea "the shape of object is spherical". This difference indicates that what we directly experience or comprehend is not even a sensory attribute (境; viṣaya), but a concept (名色; nāma-rūpa) that is an effect of 境 (viṣaya). This indicate that all our experience and knowledge is limited not only to aspects of mind but specifically 名色 (nama-rūpa).

"Nama-rūpa" is often translated as "mind and body", and such translation is persistent. Classic commentaries such as *Dīgha Nikāya*[16], *Anguttara Nikāya*[17] *and Sutta Nipāta*[18] seem to use the term to mean "mind and body". Similarly, the latest translation[19] of 正法眼蔵 (Shobogenzo) use "matter" to mean "rūpa". This idea is strongly related to interpreting five skandas as constituents of a human individual rather than something we directly experience or have knowledge of. Like Cartesian dualism, some Buddhist thought individual to be composed of mind and body. So that rūpa-skandha belongs to body whereas other four skandhas are attributed to the mind. Correspondingly, *rūpa* is related to the body since it derives from the five sense organs, whereas *nāpa* derives from mind. But as Reat[20] suggests, this "mind-body" interpretation is based on the narrow and oversimplified idea of relating rūpa-skandha to body and other four skandha (often categorised together as arūpa-skandha) to mind. In other words, rūpa refers to things we experience through the five sensory organs, whereas nama is something that originates in the mind and not the five sensory organs.

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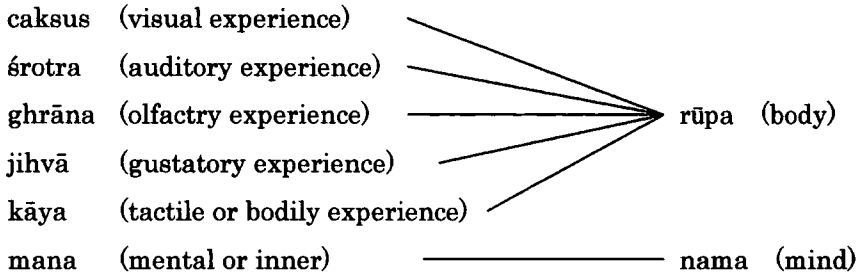
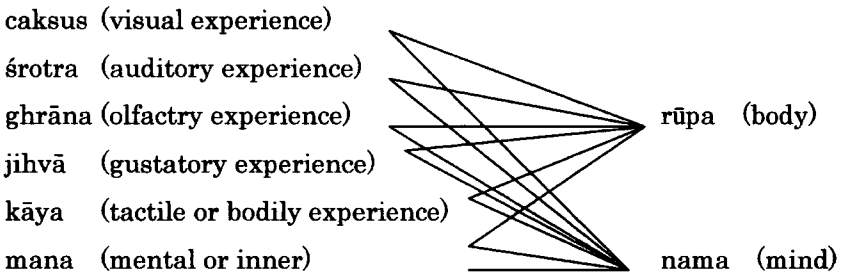
[16] *Dīgha Nikāya*『阿含経中部』, I, 223, and II, 212
[17] *Anguttara Nikāya*『阿含経増支部』, I, 83
[18] *Sutta Nipāta*, I, 13 & 35
[19] Nishijima, Gudo & Cross Chodo (tras.) (1994), *Master Dogen's Shobogennzo*, (Surrey; Windbell), p.25-31.
[20] Reat, N Ross, (1987), "Some fundamental concepts of Buddhism psychology" in *Religion*, Vol.17, p.17.

[Table 1.1.]



But as we saw earlier in examples of emotion and colour, and scent and memory, there is no such definite distinction between mental and physical experience. Both *nama* and *rūpa* can originate from any or mixture of six kinds of bare experience. The table above should be therefore revised as followed;

[Table 1.2.]



Instead of translating it as "mind and body", Zen understands it to be "word and concept". Chinese/Japanese translation of *nama-rūpa* illustrates this point. *Nama* is translated as 名 which means "name", *rūpa* is translated as 色 which is understood as "form[21]". Relating to the translation of nama-rūpa as word and concept, Buddhism, Taoism, and their subsequent Zen see a close connection between language and thought, or between verbalisation and conceptualisation. Concept defines word so that there is no word which has no concept associated to, as well as things we can conceptualise are normally given names. Moreover, their similarity is explained by the fact they are both products of one and the same process of 分別 (vikalpa), distinguishing or differentiating into two opposing categories of A or not-A.

[21] Although 色 (rūpa) is commonly translated as "form", I prefer not to use the term since it can be confused with that of Platonic sense. Form in Platonic sense is universal template which particulars exemplify or materialise in various degrees, and importantly it exits independent of existence and operation of mind. 色 (rūpa), on the other hand, is aspect of mind, thereby mind-dependent.

For Zen, 名色 (nama-rūpa) plays two important roles regarding what we experience and comprehend

1) 名色 (nama-rūpa) as a content and constituent of experience and knowledge.
2) 名色 (nama-rūpa) as a tool according to which experience and knowledge are formed.

As we have seen above, 名色 (nama-rūpa) denotes what we can directly experience or comprehend. I will explore this sense of 名色 (nama-rūpa) in section 1.2.1. The second role of 名色 (nama-rūpa) is that it works as a template or a framework according to which we can simplify and sorting out what we experience and comprehend. Since we humans are capable of learning, what we have experienced and comprehend influence what we subsequently experience and comprehend. For example, by learning music theory it become easier to read scores and play instrument. Section 1.2.2 explores how 名色 (nama-rūpa) influences our perception and knowledge and sometimes prevent us from comprehending the world as it actually is.

I am aware that my interpretation of Buddhist psychology regarding *vijñāna, viṣaya, skandha* and *nāma-rūpa* is not necessarily compatible with the conventional understanding of these terms. There are diverse positions concerning what they are and their relation to each other. To give some examples, Mahāyāna school traditionally recognises eight *vijñānas* rather than six, and some schools of Buddhism include an extra sixteen elements to six *indriyas*. My understanding of *indriyas*, *vijñānas*, *viṣayas*, *skandhas* and *nāma-rūpa* is based on 道元 (Dōgen's) interpretation of 般若心経 (Prajñā-pāramitā-sūtra) in his 正法眼蔵 (Shōbōgenzō) [22] which discusses the emptiness of these elements. My interpretation is also compatible with the psychology of Buddhism described by Conze[23] (and later Loy[24]) but more importantly it is compatible with modern psychology regarding the process of perception.

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[22] Dōgen's Shōbōgenzō, II,71-73
[23] Conze Edward. (1962), *Buddhist Thought in India*, (London; Gerge Allen & Unwin).
[24] Loy, David, (1983), "The difference between samsāra and nirvāna," in *Philosophy East and West*, vol.33, p.356.

1.2. Zen scepticism

1.2.1. No direct access to 寂滅 (nirvāna)

The first premise for the negative 空 (śūnyatā) is the claim that we have direct access only to 流転 (samsāra) and not 寂滅 (nirvāna). In other words, what we experience or (believe to) know as reality is in fact an image or reflection of reality upon our minds and not reality as it anyway is. This claim is based on the fact that our experience and knowledge are ultimately composed of 名色 (nama-rūpa). The previous section explained Zen's belief that all we can directly be aware or conscious of are limited to 五蘊 (five skandha) and their contents 名色 (nama-rūpa). This section aims to prove 名色 (nama-rūpa) belongs to the relative reality (流転; samsāra) and not the mind-independent reality (寂滅; nirvāna), by demonstrating the relativity or mind-dependency of 名色 (nama-rūpa). The relativity and mind-dependence of 名色 (nama-rūpa) can be illustrated by the relativity of 六識 (six vijiñānas) and 六境 (six viṣayas). It is easy to understand that 法境 (dharma viṣaya) belongs to mind and not mind-independent reality. We, however, often falsely assume the other five 境 (viṣaya) to belong to the mind-independent reality. This idea that we falsely believe that physical attributes are innate to objects themselves is not alien to western philosophy. Russell beautifully illustrated this point in the following remark;

> We think that grass is green, that stones are hard, and that snow is cold. But physics assures us that the greenness of grass, the hardness of stones, and the coldness of snow, are not greenness, hardness, and coldness that we know in our own experience, but something very different. The observer, when he seems to himself to be observing a stone, is really, if physics is to be believed, observing the effect of the stone upon himself.[25]

What we experience, such as greenness, hardness and coldness are not necessarily

[25] Russell, Bertrand (1940), *An Inquiry into Meaning and Truth*, (London; Allen & Unwin), p.5.

true attributes or properties that belong to the object or to the mind-independent reality. Instead, they are subjective effects of reality upon our minds. This means that sensory experience is not an experience of reality but experience of the subjective effect of reality.

[Table 1.3.] Attributes and their effects

色 (rūpa-viṣaya);	red colour of an object	=	light reflected off the object
觸 (sparśa- viṣaya)	pain	=	stimuli to nerve of insufficient circulation of blood
聲 (śabda- viṣaya)	sound of a falling timber	=	compression of air and other medium
味 (rasa- viṣaya);	taste of salt	=	biochemical reaction to sodium chloride
香 (gadha- viṣaya)	smell of vanilla	=	existence of airborne vanilla particle

We often mistake these qualities on the left hand side to belong to objects themselves. But if we think carefully, we understand that they are not innate properties of an object or of the world as it really is. The object is not red when it is placed in darkness or under coloured light. Pain does not exist in a wound, but in our head, this is clear from the fact that a brain-dead patient does not feel pain, even though the nerve is sending pain signal from the wound. From these examples, it is obvious that 六境 (six viṣayas) are not properties and attributes that belong to the mind-independent reality (寂滅; nirvāna), but its effects upon our mind. In other words, 六境 (six viṣayas) belong to relative reality in our mind (流転; samsāra) and not the mind-independent reality. Because 名色 (nama-rūpa) derives from 六境 (six viṣayas), and the latter is already mind-dependent or relative, then it is obvious that 名色 (nama-rūpa) is also mind-dependent and relative.

Because what we can experience or have knowledge of are composed of 名色 (nama-rūpa) and they belong to 流転 (samsāra) and not 寂滅 (nirvāna), we must conclude that our experience and knowledge are limited to 流転 (samsāra).

1.2.2. Discrepancies between 流転 (samsāra) and 寂滅 (nirvāna)

We understood so far what we have direct access to is limited to 流転

(samsāra; the relative reality) and not 寂滅 (nirvāna; the mind-independent reality). But this does not immediately lead to epistemological scepticism. Even if we cannot have direct access to 寂滅 (nirvāna), as long as 流転 (samsāra) accurately reflects the way 寂滅 (nirvāna) is, then having knowledge of the former is the same as having knowledge of the latter. However, Zen thinks that is not the case. This section examine why discrepancies exist between the two.

According to Zen, the source of the discrepancies between 流転 (samsāra) and 寂滅 (nirvāna) is functions of 名色 (nāma-rūpa; concept). Not only do we falsely believe what 名 色 (nama-rūpa) refers to existence in the mind-independent reality, but also 名色 (nāma-rūpa) distorts our experience and comprehension. D.T. Suzuki compares this process with what he called "tyranny of tools"[26]. We invent or construct many ideas, concepts and names that are useful for us to deal with complex affairs of reality. But, they often turn tyrannical and start controlling the way we think or behave. Suzuki gives the example of modern machinery.

> This strange process is especially noticeable in modern life. We invent many machines, which in turn control human affairs, our human life. Machines, especially in recent years, have inextricably entered our life. We try to adjust ourselves to the machine, because the machine refuses to obey our will once it's out of our hands.[27]

Zen thinks that concepts, words and ideas are like these tools, they enable us to simplify the complex affair of reality, but they often turn tyrannical. To describe this process I use a phrase "the tyranny of 名色 (nāma-rūpa)".

In order to understand how 名色 (nama-rūpa; concept) influence and create discrepancy between 流転 (samsāra) and 寂滅 (nirvāna), I distinguish two interwoven yet distinct faculties of mind. One is the faculty of experience, and the other is the faculty of reason. I recognise these two faculties to be distinct because

[26] Suzuki, D.T. (1998), *Buddha of Infinite Light*, (Boston, U.S.A; Shambhala Publications Inc.) p.43. This is revised version of talk he gave to American Buddhist Academy in 1958.
[27] Suzuki, D.T. (1998), ibid, p.45.

we do not necessary believe what we perceptually experience to be the way the world is. For example, even if I had visual experience of seeing an elephant wearing a tutu in my living room, unless there is strong evidence to support my visual experience of the elephant, I would not claim to *know* that such an elephant exists in my living room. In such process, the faculty of reason informs me that seeing the elephant is an illusion or hallucination. Moreover, there are several kinds of knowledge, such as mathematical and logical knowledge, which does not directly involve the faculty of experience. In order to accommodate such cases, I artificially distinguish two faculties by defining experience to be an inadvertent process whereas reasoning is a conscious or intentional process. Psychologists[28] would disagree on such a clear distinction I have drawn between the faculty of experiencing and the faculty of reasoning. Psychological studies show that it is impossible to separate the faculty of experience and the faculty of reason. The reason I distinguish these two faculties is not a psychological one, but a philosophical one, as well as simply a matter of convenience. Such division is common practice in epistemology. This can be understood from the title of a famous paper by Gettier "Is justified true belief knowledge?"[29]. In epistemology, experience is understood to be the process of forming belief, whereas reasoning is a process of upgrading belief into knowledge. The first part of this section (section 1.2.2.1) deals with how 名色 (nama-rūpa) influences and distorts subconscious or the involuntary process in the faculty of experience. Then the second part (section 1.2.2.2) looks into the ability of the faculty of reason; whether it is possible for us to correctly distinguish true perception from false one or 名色 (nama-rūpa) mar this ability.

1.2.2.1. The faculty of experience

We use our sensory organs to comprehend our physical external world. My eyes inform me whether grass in my garden is green or brown, a pain in my stomach tells me that I ate something rotten, scents that my nose picks up alerts

[28] To give some examples: Neisser, U. (1976), *Cognition and Reality* (San Francisco; W.H.Freeman), Eysenck, M.W. & Keane, M.J. (1990), *Cognitive Psychology*, (Hove, Sussex: Lawrence Erlbaum Association).

[29] Gettier Edmund L. (1963) "Is justified true belief knowledge?" in *Analysis* Vol.23, p121-123.

me that toast is burning in the kitchen, my tongue ... realise that I put salt instead of sugar in my coffee, and from the loss ... a cold night. The question is how reliable are these ... revealing the way the external world is. I will examine three arguments ... idea that perceptual experience reveals the true nature of the external world as it really is. Arguments I present are:

a) The limitation of our senses.
b) Overpowering subconscious cognitive process that distorts content of our experience; and
c) The possibility of pseudo-sensory experience.

1.2.2.1a. The limitations of our senses

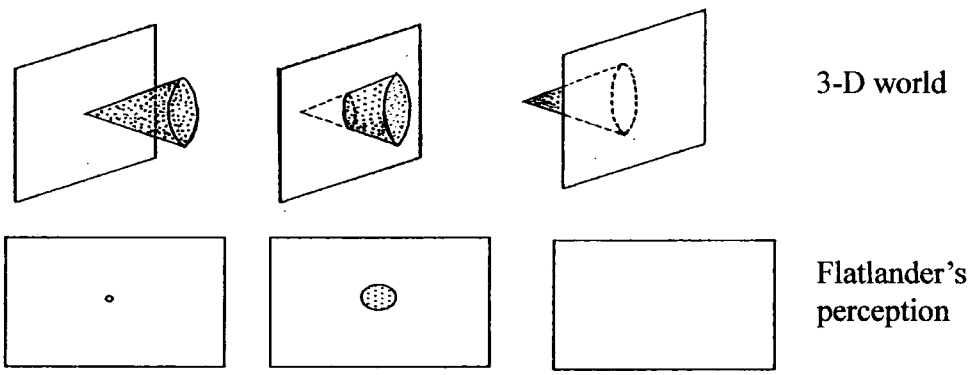
Our sensory organs are, unfortunately, limited in their abilities. In terms of vision, human eyes can only perceive within the narrow portion (390nm-700nm) of the electromagnetic radiation spectrum. Moreover, we cannot see an object at a great distance or an object which is too small for our naked eye. Other sense organs are also limited in their capacities. Our auditory sense is more limited than our vision. We can only hear sound between 20 – 20,000Hz, and we cannot discern different noise. For example we cannot hear the TV when there are people talking in the same room. Our skin cannot tell temperature change within 1 or 2°c, and we do not register slight damage to our body unless nerve impulses caused by the damage exceed our neurotransmitter threshold. Our nose and tongue cannot identify small amounts of chemicals that exist in the air or in food we consume.

It is true that, using external instruments, we are able to go beyond the limitation of our own senses. An infrared camera enables us to go beyond the highest human limit of visible rays and also makes it possible for us to see in the dark. Using Hubble telescope, we can see a greater distance than we could imagine 40 years ago. A microphone can pick up minute sounds or sounds above or below the frequency human ears can detect. Although these instruments expand the limits of our perception, there are and always will be further limits. Improvement of telescopes enables us to see further distance in the universe, but we can never see the entire universe. There always will be sound that occurs too

far away, which a microphone cannot pick up.

Moreover, although an instrument can expands the domain in which we can experience, it does not solve the true limitation of our perception. The true limitation of our perception is that our sense organs can pick up only limited aspects of reality. We experience the world in terms of five aspects; vision, sound, smell, taste and touch. This has serious implication for our ability to understand the way the world really is. "The Flantlander" argument illustrates this point. Suppose there are people who live in a two dimensional world which exists within the three dimensional space. When a conic object moves through three dimensional space, penetrating the two dimensional world, Flatlanders (two dimensional people) perceive it only as growing ellipse which disappears when it reached a certain point.

[Fig.1.1.] Flatlanders



Because Flatlanders have only two-dimensional perspective, they would not understand how this grow-and-disappear-ellipse phenomenon occurs. If this happens time and time again, Flatlanders may come up with false theory of the grow-and-disappear ellipse rather than a theory of how three-dimensional objects penetrate two-dimensional space. We may be in the same position as these Flatlanders regarding our sensory perception. We can only experience limited aspects of the world which our sense or scientific instruments can reveal. And there may be many other aspects beyond the five we can perceive which we are not aware of. This idea appeals to many modern scientists who try to explain counter-intuitive quantum phenomena. They argue that the reason we cannot explain quantum phenomena is because there are unknown dimensions or forces

that operate in quantum level which cannot be comprehended as the extension of the five human senses.

The danger of the limitation is not only about our inability to experience the mind-independent reality as it anyway is, but it creates rooms for the tyranny of 名色 (nama-rūpa) to operate to create discrepancies between the reality as it anyway is. If there is no limitation of the sense, we are able to experience things as they are. But unfortunately this is not the case. Like the flatlanders, we have to guess or assume what may be going on at the level which we cannot experience, and that creates the possibility for us to make a wrong guess. In the next section, we will look at how such mistakes are made at the subconscious level.

1.2.2.1.b. Overpowering subconscious cognitive process

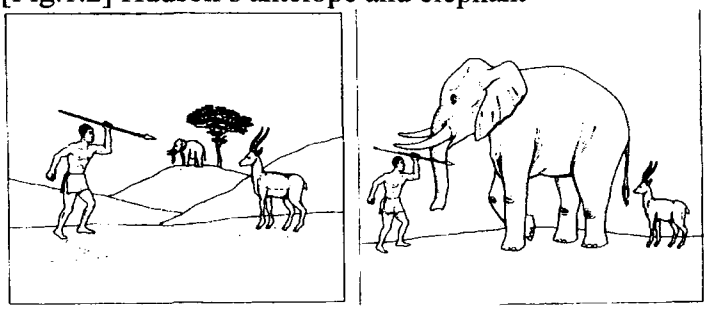
Cognition is often described as top-down mental process of ideas and concepts influencing our experience. This process has to be distinguished from the bottom-up process of perception. According to Gibson[30], perception is a process of 'picking–up information' without referring to other inner processes. Cognition is, on the other hand, a process of sorting the information (sense data) by referring to other faculties of the mind. Marr[31] defined cognition as a computational process, and perception as activity of collecting 'raw sensory form' which the computational process of cognition works on. Cognition is not merely sorting out raw sensory data, but in Ayer's words, it is a process of 'going beyond immediate sensible perception'[32], because through the process of cognition, we experience properties which are not present in bare perceptual experience. For example, if I look at a painting by Monet, what my perception reveals is colour patches in a two dimensional canvas. But what I experience is not only colour patches, but a three-dimensional image of a bridge, trees and water lilies. This illustrates that the process of cognition is related to ideas and concepts we possess added to raw sense data derived from perception.

Cognition is a useful and necessary process for our understanding of the

[30] Gibson,J.J.(1966), *The Senses Considered as Perceptual Systems*, (Boston, U.S.A; Houghton Mifflin)
[31] Marr, David (1982), *Vision*, (San Francisco, U.S.A; W.H.Freeman), p.29ff
[32] Ayer, A.J. (1973), *The Central Questions of Philosophy*, (London; Weidenfeld & Nnicolson), chapter.4 & 5, p.68-111.

world. In fact without it, it is almost impossible to carry on our normal life. For example, raw visual sense data that derives from the retina is two dimensional. Only through the process of cognition we can create a three-dimensional image of our external world. Without spatial awareness of our environment, we cannot walk anywhere because we would be walking into various objects. Studies on depth perception revealed how concepts (名色; nama-rūpa) influence cognitive process. To understand the relation between concepts (名色; nama-rūpa) and its role in cognition many studies are carried out on infants. Studies on infants are important because babies have not yet acquired many concepts or ideas that would influence their sensory experience. What studies on infants show is that, although infants have spatial awareness based on binocular vision[33], when a two-dimensional image, such as a photograph or a painting of a group of objects is presented, the infant cannot understand spatial relationships between objects. Looking at the following picture, we understand that the antelope is the one the hunter is trying to spear and not the elephant. But without possessing concepts concerning the sizes of humans, elephants and antelopes, it is possible to assume it is a small elephant the hunter is trying to spear.

[Fig.1.2] Hudson's antelope and elephant[34]



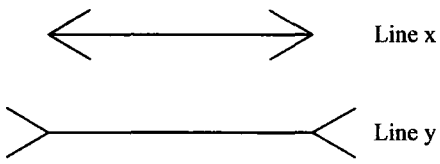
This proves two important points. The first is 名色 (nama-rūpa; concept) is something we form or acquire through learning. The second is how different 名色 (nama-rūpa; concept) lead to different sensory experience. This means an identical sensory input can lead to different kinds of experience depending on different 名色 (nama-rūpa; concepts) percipient possesses.

[33] Infants can understand the spatial relation between different objects based on slight differences between image from left eye and image from right eye.

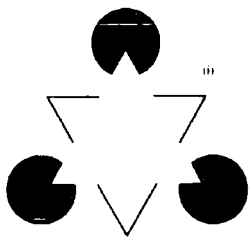
[34] Extracted from Hudson, W. (1960), "Pictorial depth perception in sub-cultural groups in Africa" in *Journal of Social Psychology*, vo.52, p.183-208

Although the process of cognition is normally useful to us, it can sometimes backfire and over-interpret raw sense data and cause incorrect impressions of our external world. Looking at the following two sets of drawing, we understand how overpowering cognition works.

[Fig. 1.3.a.]



[Fig.1.3.b]



In the figure 1.3.a, even though line *x* and *y* are the same length, we experience otherwise. In the figure 1.3.b, although there is no triangle in the middle, we still see a white triangle. These visual illusions are created by the process of cognition. We subconsciously recognise visual clues and add incorrect information to our visual experience. Cognition is useful and necessary process in experiencing things, and 名色 (nama-rūpa) has important role in the process. But in the process of cognition, 名色 (nama-rūpa) can turn tyrannical and prevent us from experiencing the world as it really is. This is the first problem of cognition; the process of cognition can distort raw sense data, so that our sensory experience of the world does not accurately reflect the way the world really is.

The second problem of cognition is that because it is a subconscious process, our conscious volition have no control over the process. This point can be illustrated by ambiguous figures, such as duck/rabbit drawing and a picture of Leeper's ambiguous lady.

[Fig.1.4.] Duck/rabbit and Leeper's ambiguous lady[35]

Can you see duck and rabbit?

Can you see an old witch and a young lady?

Although we rationally understand that each figures contains two different images (duck and rabbit, and young woman facing away and old witch with a crooked nose), we cannot see both images *simultaneously*. This is because our subconscious chooses which figure to see and our conscious mind cannot overpower the choice the subconscious makes. This proves that the subconscious process of cognition is an overpowering conscious process, so that we cannot consciously turn off cognition even if it distorts experience.

There are two arguments that object this claim. The first is an argument that it is possible for us to turn off the influence of cognition at will. If I ask someone to describe his visual experience of a painting "Clair de Lune" by Chagall, he can describe it as 'a picture of a couple under the night sky with a clear moon'. But he can also describe it as a mere collection of colours (e.g. 'upper visual field is blue with a spot of yellow, lower part is mainly red except the left hand side which is blue, and the middle area is a mixture of different colours'). The second statement is certainly cognition-free, in the sense it is a description of his bare sensation. Strawson, however, dismisses the possibility of genuine cognition-free sensory experience. Strawson argues that the person is not having cognition–free experience, although what he claims to experience seems to be cognition-free.

> An Observer, gazing through his window, may perhaps, by an effort of will, bring himself to see, or even willessly find himself seeing,

[35] Copied from Gross, Richard D. (1992), *Psychology –The Science of Mind and Behaviour-*, (London; Hodder & Stoughton), p.242.

> what he knows to be the branches of the trees no longer *as* branches at all, but as an intricate pattern of dark lines of complex directions and shapes and various size against a background of varying shades of grey.[36]

What Strawson is saying here is that even though the observer's sensory experience is not cognition free, he can consciously analyse his sensory experience using his mental faculty of reason and estimate what his sensory experience *would be like* if there is no cognition involved. This can be easily proven by the following experiment. Suppose there is a philosopher who claims that cognition-free sensory experience is possible. We ask him to turn off the process of cognition and to describe his visual experience. When he starts describing his sensory experience, throw a cricket ball as hard as possible towards his head. Because visual spatial understanding is the result of cognition[37], if he is truly having cognition-free sensory experience, he would not react to avoid the ball. I can safely assume that the experiment would proves he is not having cognition-free experience since he will avoid the ball. This illustrates that what seems to be cognition-free sensory experience is not genuinely cognition-free.

The second argument which supports cognition-free experience is related to the sensations of pain, itchiness, hunger, cold and warmth. It argues that having a concept or experience of these sensations does not influence the intensity of sensory experience. Suppose that three days ago I burnt my finger for the first time in my life, so that I acquired a concept of pain. If I burn my finger today, whether I have experienced burning pain before or not does not change the intensity of the pain I feel. Moreover, a new born baby and an adult feel similar acuteness and intensity of colour and light. Studies carried out by Bornstein[38] and

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[36] Strawson, P.F. (1988), "Perception and its objects" in Dancy J (1988), *Perceptual Knowledge*, (Oxford; Oxford Univ. Press), p.98.

[37] Bare sensory perception of such experience is a patch of red area in visual field rapidly increasing in diameter. Depth recognition derives from identifying depth cues.

[38] Bornstein, M.H. (1988), "Perceptual development across the life cycle", in Bornstein, M.H.& Lamb, M.E. (eds.), *Perceptual, Cognition and Linguistic Development*, (Hove; Lawrence Erlbaum Ltd.), Ch19, p.401-19

by Packer et al[39] show that a baby can distinguish colours and intensities of light as accurately as a normal adult. This contradicts the claim I made above that 名色 (nama-rūpa) we acquire influence cognition therefore an adult how obtained 名色 (nama-rūpa) experience the world differently from an infant. It is, however, a shortcoming to make a claim that these sensory experiences are cognition-free. There are mental factors such as attention and expectation which can alter the intensity or degree of sensory experience. One can learn to influence the intensity of sensory experience. We can cope with certain pain when we know what sort of pain and when the pain is coming. Or when one's attention is spent elsewhere, one can seem to forget about toothache or headache, even though the pain is still there regardless of whether the attention is spent elsewhere or not. These illustrate that even though pain as bare sense data is cognition-free, sensation of pain one feels would be influenced by cognition. This can be explained easily according to Zen psychology. As I mentioned earlier, what we directly experience are not 六識 (six-vijiñānas) but 五蘊 (five skandha). Even if 身識 (kāya-vijiñāna; bodily sensation) are identical, a resulting 色蘊 (rūpa-skandha) can be different according to 名色 (nama-rūpa) the percipient possess.

[Eq.1.1]

vijinana + nama-rupa A = rupa skandha A

vijinana + nama-rupa B = rupa skandha B

I agree that not every sensory experience is altered by the process of cognition, and there are some exceptions. I believe experiences of colour and intensity of light are two of these exceptions. This, however, does not harm my argument about the tyranny of 名色 (nama-rūpa) upon the faculty of experience, because of the third problem.

The third and final problem of cognition is that because cognition is a subconscious process, the faculty of experience alone cannot distinguish which sensory experience is distorted by the process of cognition and which is not. Going back to the parallel lines and the invisible triangle, we understand them to

[39] Packer, O., Hartmann, E.E. & Teller, D.Y., (1985), "Infant colour vision; the effect of test field size on Rayleigh discriminations", in *Vision Research*, vol.24, p.1247-60.

be visual tricks because the faculty of reason opposes the faculty of experience. I will discuss the ability of the faculty of reason to distinguish cognition-distorted experience and genuine experience. Before that, let us consider the problem of pseudo-sensory experience which is a direct consequence of the inability of the faculty of experience to distinguish genuine and cognition-distorted experience.

1.2.2.1.c. Pseudo-sensory experience

The problem mentioned above was the problem of cognition-distorted experience. What I mean by pseudo-sensory experience is the experience that does not actually derive from sensory organs, but falsely appears otherwise. A difference between cognition-distorted experience and pseudo-sensory experience coincides with the difference between illusion and hallucination. Illusion is misapprehension of sensory input that derives from our sensory organs, whereas hallucination does not require these sense organs. The latter is apparent or alleged perception of an object not actually present, in other words a fabrication of the mind. Descartes argued that sensory experience is not reliable because we cannot deny the possibility that what we experience is either a dream or an hallucination created by a powerful demon.

> How often, asleep as night, am I convinced of just such familiar events – that I am here in my dressing-gown, sitting by the fire – when in fact I am lying undressed in bed! ... As I think about this more carefully, I see plainly that there are never any sure signs by means of which being awake can be distinguished from being asleep. The result is that I begin to feel dazed, and this very feeling only reinforces the notion that I may be asleep.[40]

There is a similar case of false perception known as "a brain in a vat"[41]. Several neurological experiments show that a direct electric stimulus to the brain triggers sensory experience. Although neurophysiologists have not yet composed a

[40] Descarte, R. *Meditations of First Philosophy*, 1.19. I use the translation by Cottingham, John (1986), *Meditation of First Philosophy*, (Cambridge; Cambridge Univ. Press)
[41] Nozick Robert. (1980), *Philosophical Explanation*, (Oxford; Oxford Univ. Press).

convincing sensory experience, it is theoretically possible in the future to create virtual reality by direct electric stimuli to the brain. Since a brain itself cannot distinguish between electric pulses derived from sensory organs and ones derived from electrodes, it is not possible for the percipient to tell the difference between genuine sensory experience and pseudo-sensory experience derived from electrodes.

Even though the cases of the evil demon and the brain in a vat may be too far-fetched, there still exists a problem that can be exhibited by a simple everyday experience. We all have experienced one time or another that we thought we heard someone call our name, although no one actually did. We cannot distinguish pseudo-sensory perception and genuine one, since as far as sensory experience is concerned, there is no difference between genuine sensory experience and pseudo-sensory experience.

1.2.2.2. The faculty of reason

Arguments in the previous section concluded that the faculty of experience cannot be a reliable source of our knowledge, because what experience reveals is finite aspects of reality which is possibly distorted by 名色 (nama-rūpa) in the process of cognition, or in the worst case, pseudo-sensory experience. This unreliability of the faculty of experience, however, does not directly lead to epistemological scepticism. If the faculty of reason grants us an ability to deduce truth from the distorted sensory experience or an ability to distinguish genuine sensory experiences from false ones, it is theoretically possible for us to obtain knowledge of the mind-independent reality. This section looks into a possibility for the faculty of reason to provide us with such abilities, and aims to conclude that the tyranny of 名色 (nama-rūpa) prevents such a possibility.

In order to examine how the tyranny of 名色 (nama-rūpa) prevents the faculty of reason to provide such abilities, this section look into arguments against *scientific realism*. Scientific realism is an idea that scientific method bestows upon us an ability to deduce truth from empirical evidence and an ability to recognise true theory as true and false theory as false. I will explore the reliability of scientific method, because it is commonly believed that scientific method is the

most reliable or at least a more reliable method than the way we normally apply the faculty of reason. If I can come to a conclusion that even scientific method does not provide us with the ability to distinguish genuine experience from pseudo experience and to deduce the way the world really is from sensory experience, then our mundane knowledge cannot be knowledge of the world as it really is. Arguments for and against scientific realism focus on two separate yet interwoven issues. One is the forming of the scientific theory, and the other is the verification of the scientific theory. I concentrate on the latter issue which concerns the reliability of scientific method to distinguish true theory and false theory. I do so, because even if we possess the ability to form true belief, unless we have some independent method to confirm truth value of the theory, we cannot claim to possess knowledge. I will divide the arguments for and against into two categories, analytical studies on scientific method and socio-historical observation of science and the scientific community. Although, there are many theories in philosophy of science that discredit the scientific method, I focus on just three: under-determination of theory by data, pessimistic meta-induction from past falsity and relativity in choice of scientific theory.

1.2.2.2.1. Analytical argument against scientific realism.

Under-determination of theory by data is, according to Boyd, 'a single, simple, and very powerful epistemological argument that represents the basis for the rejection of scientific realism'[42]. It argues that a theory's compatibility with evidence cannot be used as a criterion to judge the truth value of the theory. According to Duhem-Quine[43] thesis, a scientific theory (T) does not normally lead to a prediction (P) on its own, it always requires an *auxiliary hypothesis* (H). Auxiliary hypotheses are background assumptions or underline principles that are not necessarily manifested in a theory. It is necessary for a scientist to accept certain auxiliary hypotheses since an individual scientist does not have enough

[42] Boyd, Richard, (1984), "Current status of scientific realism" in Leplin (ed.) (1984), *Scientific Realism*, (Berkley, U.S.A.; Univ. of California Press), p.42.

[43] The idea was originally declared by Duhem, P. (1962) in his *The Aim and Structure of Physical Theory* (N.Y.; Atheneum). Then the idea was modified by Quine, W.V., (1961) in his "Two dogmas of Empiricism" (1953) reprinted in his *From a Logical Point of View*, (N.Y.; Harper & Row, p.20-46).

time and resources to check every fact related to the topic of this interest. For example, to understand composition of Neptune, a scientist has no time to assess theories in inorganic chemistry, spectroscopy, Newton's law of gravitation, etc. He has to assume them to be true. In this sense, auxiliary hypothesis can be understood as 名色 (nama-rūpa), since it is an idea or concept which enables us to simplify and to sort out experience and knowledge. The problem of auxiliary hypotheses is that identical empirical evidence (E) can give rise to different theories (T1 and T2) depending on an auxiliary hypothesis.

[Eq. 1.2] Duhem-Quine thesis

$$H1 \neq 2$$
$$(T1 \& H1) \rightarrow P \qquad E \,\&\, H1 \rightarrow T1$$
$$(T2 \& H2) \rightarrow P \qquad E \,\&\, H2 \rightarrow T2$$

This means that no empirical evidence can be used to falsify or justify the legitimacy of any theory, since "any theory can be reconciled with any recalcitrant evidence by making a suitable adjustment in our other assumption [auxiliary hypothesis] about nature"[44]. Compatibility of a theory with empirical evidence is important to scientific method, since what is defined as scientific method is verifying the truth value of theory against the accumulation of empirical evidence under a controlled environment. If empirical evidence is not a reliable criteria to judge the truth value, then scientific method cannot be used to judge truth value of theory.

There is a powerful objection against the under-determination of theory by data, which is called 'no-miracle argument'. Worrall outlined 'no-miracle argument' as follows:

> It would be a miracle, a coincidence on a near cosmic scale, if a theory made as many correct empirical predictions, as say the general theory of relativity or photon theory of light *without* what that theory says about the fundamental structure of the universe being correct or

[44] Laudan, Larry. (1996), *Beyond Positivism and Relativism*, (Oxford; Westview Press), p.36.

'essentially' or 'basically' correct.[45]

No-miracle argument is based on the mathematics of probability. Suppose a false theory *T* which is *accidentally compatible*[46] with empirical evidence *E1*. If a probability for the theory *T* to be accidentally compatible with *E1* is 5%, then the probability for the theory *T* to be accidentally compatible with not only *E1* but also two further events (*E2* and *E3*) is mathematically 5% x 5% x 5% = 0.0125% (multiple of probabilities for the theory to be compatible with each three events). This indicates that the more events are referred to the theory *T*, the less probable for the theory *T* to be accidentally yet repeatedly empirically adequate. Therefore, if the theory *T* is repeatedly compatible with various evidences, it is less likely that its compatibility is purely accidental. This counters the under-determination of theory by data which denies empirical adequacy as a criteria to judge truth value of scientific theory. No-miracle argument claims that empirical evidences can be used as an criterion to judge the truth value of scientific theory, providing that there are fair amounts of evidence in order to reduce the possibility that theory is accidentally compatible with evidence.

No-miracle argument is strengthened further by an argument called *conjunction argument* which was forwarded by Putnam[47]. In science, there are many examples of conjunctions of two or more mutually-independent theories which produce a new empirically adequate theory. If anti-scientific realism is right (in the sense that the success of a theory is merely accidental), the possibility for the resulting theory to be empirically adequate is very slim. The possibility of this happening is equal to probabilities of the original theories of being accidentally empirically adequate multiplied by the resulting theory also to be empirically adequate. It is most unlikely that any accidentally empirically adequate theory can successfully satisfy such minute odds.

The focal point of this section is a question of whether or not is it possible for

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[45] Worrall, J. (1989), "Structural realism" reprinted in Papineau, D, (1996) *The Philosophy of Science*, (Oxford; Oxford Univ. Press), p.140

[46] The theory *T* does not at all correspond with mechanics of why and how *E1* occurred, yet it is compatible with empirical evidence of what occurs.

[47] Putnam, H. (1975), *Mind, Language and Reality; Philosophical Paper Vol.2*, (Cambridge; Cambridge Univ.Press).

us to judge truth value of our belief or theory using the accumulation of empirical evidence. Under-determination of theory by data claims that because any theory or belief can be justified using whatever empirical evidence depending of auxiliary hypothesis, a theory's compatibility with empirical evidence cannot be used as a criterion to judge its truth value. What no-miracle argument and conjunction argument propose is that, although compatibility with a limited number of empirical evidences alone cannot prove or disprove truth value of the theory, the inclusion of the further success of the theory would improve the ability to judge truth value of the theory. Some scientific realists add further criteria of measuring success, such as the absence of ad hoc argument, simplicity, and so forth. These further criteria strengthen the reliability of the scientific method, because the more criteria the more difficult for false theory to be successful. If we can apply the same principle to not only scientific theory but also everyday beliefs, theoretically, the faculty of reason should enable us to measure truth value of every day belief based on its success, even though the degree of reliability may be somewhat lower.

1.2.2.2.2. Historical evidences against scientific realism

The previous section concluded that because the truth value of a theory is proportional to the success of the theory, by employing success of theory as criteria, scientific method enables us to measure and determine the degree of approximate truth. This seems to guarantee reliability of the faculty of reason concerning scientific method. There are, however, two problems with the reliability of scientific method. Firstly, reliability of the scientific method is based purely on probability. This means that although it is highly unlikely, scientific realists cannot deny a remote possibility for false theory to be accidentally successful. The second problem arises from socio-historical studies of science that reveal two things.

a) There are many cases of successful theory that turned out to be false.
b) Often theory choice is determined not by the success of the theory but by social dynamics of the scientific community.

The former objection is simply a list of past successful theories which turned out to be false. This kind of argument against scientific realism is known as *pessimistic meta-induction from past falsity*. The latter is a study of what determines theory choice other than the success of the theory. The latter kind is often known as *value laden theory of science* or *social influence on theory choice*.

1.2.2.2.2.a. Pessimistic meta-induction from past falsity

Historical studies on past scientific theories indicate that there is no link between the success of a theory and the truth value of the theory. There are many examples of successful theories that have turned out to be false. A famous example of this sort is that of *ether theory*. Although there is no such substance as ether, ether theory is considered as the most empirically successful unified theory in the history of physics so far. Ether theory is considered the most successful, because a wide range of physical or chemical phenomena were explained by ether. Caloric ether was used to explain thermodynamics. Fresnel successfully predicted diffraction and polarisation of light, using a theory of optical ether. Ether was used to explain even some medical conditions. If success and truth value of theory are proportional to each other as scientific realism claims, then ether theory could not have been so successful. The fact that ether theory was successful despite it was false theory proves that there is no apparent connection between success and the truth value of a theory. Moreover, because past theories were always proven to be false, historical studies on science implies that current theory will eventually turn out to be false. In other words, history of science implies that success of current theory does not guarantee the theory to reflect the way the world is, and it is likely that in the future it will be proven false.

1.2.2.2.2.b.Social influence upon theory choice.

Socio-historical studies on science indicate that theory choice is not necessarily based on its successfulness, instead it is influenced more from social convention or the social dynamics of the scientific community. In other words, even thought no-miracle argument and conjunction argument guarantee success of theory to be an reliable indication for the truth value of a theory, if theory choice

is not necessary made based purely on the success, less successful theory can be chosen over more successful theory. What this implies is that even if there is the relativity between success and truth value of theory, there is no guarantee that currently accepted theory reflect the reality.

According to Kuhn[48], the history of science is not a steady progress toward truth, but consists of occasional *paradigm* shifts and maturing of scientific theories within each paradigm. Although his definition of "paradigm" is ambiguous, the term is normally understood as an unquestioned set of scientific and metaphysical beliefs or assumptions that make up a framework within which scientific theories can be tested, evaluated and revised. Like auxiliary hypothesis, paradigm is 名色 (nama-rūpa) as a tool; concept or a network of concepts which enable a scientist to carry out a detailed study of a specific topic without evaluating related theories and underline principle. What makes Kuhn's view unique is his claim that paradigms are incommensurable; when there are two paradigms we have no way of knowing or measuring which one reflects reality better. Kuhn argues that paradigm choice is made according to social consensus rather than successfulness of paradigm as a scientific realist supposes.

Longino's book *Science and Social Knowledge*[49] illustrates how *values*, other than successfulness of a theory, influence theory choice. Longino recognises two kinds of value; *constitutive value* and *contextual value*. Constitutive values are what I so far described as successfulness of the theory such as empirical adequacy, simplicity and breadth of the theory, whereas contextual values are funding, social consensus, and other socio-cultural values. Longino recognises two ways contextual value influences science; weak and strong influence. The weak influence is relating to funding. Scientific enquiry require a money, thereby funding is a key to the success of research. Scientists, therefore, are reluctant to upset those who financially support the research. Especially company scientists are unwilling to provide a negative result regarding a product of their own company. What is interesting is that academic institutes which are believed to be independent and do not represent interests of commerce are no longer independent.

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[48] Kuhn, Thomas S. (1970), *The Structure of Scientific Revolutions – 2nd ed.-*, (Chicago; Univ. of Chicago Press).

[49] Longino, H. (1990), *Science as Social Knowledge*, (Princeton; Princeton Univ. Press)

Currently most funding for research in university come from commerce, therefore even academic scientists are reluctant to provide research results which contradict the interest of the benefactor. Ziman[50] called such a university a "post academic university". This corruption of independent judicator of scientific theory is widespread. For example in the United States, even a government body did not provide independent judgement[51]. The weak influence does alter the outcome of scientific enquiry, but it does not necessarily influence the belief of a scientist who carries out research. Strong influence, on the other hand, alters even scientist's belief. The idea is often known as *social constructionist's account of science*. Barnes and Bloor[52] argues that the social position of scientists influence acceptability of theory. For example, when there are two theories with equal constitutive values, the scientific community chooses a theory by a well-known scientist rather than a theory proposed by an unknown scientist. This is exactly what happened to Huygens when he proposed the wave theory of light almost simultaneously to Newton who suggested light was a stream of particles. Despite its superior explanatory power, Huygens' wave theory of light was overshadowed by Newton's particle theory, simply because Newton had an unprecedented influence on the scientific community. There is an another kind of strong influence called "ideology critique". Richardson[53] argues that scientific theory can be rejected or accepted not because of it constitutional value, but because of the social value or ideology it supports. The most obvious case was Galileo's model of the solar system. His theory was rejected and he was even prosecuted, just because his theory contradicted the commonly-held view backed by the religious authority. In this case, the theory of celestial motion was chosen on the

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[50] Ziman, John. (2003), "New Instrumental Roles of Science" in *Science and Engineering Ethics*, Vol.9, p.17-21.

[51] In United States, there is an ongoing case of a ballistic missile sensor developed by TRW. In mid-1990s, Pentagon's Missile Defence Agency carried out test on the sensor which claims to distinguish simulated nuclear warheads and dummy (decoy) warheads. Pentagon sent results to Massachusetts Institute of Technology for verification. Theodore Postol, physicist and weapons expert who works in MIT, claims that MIT intentionally fail to expose original tests to be flaw, since MIT receives vast funding from Pentagon.

[52] Barnes, Barry & Bloor, David. (1982) "Relativism, rationalism and the sociology of knowledge" in *Rationality and Relativism*, Hollis, M & Lukes, S. (eds.) (Cambridge Mass; MIT Press)

[53] Richardson, Robert C. (1984), "Biology and Ideology; The interpretation of science and values" in *Philosophy of Science*, vol.51, 0.396-420.

basis of compatibility with established religious view of the world at the time and not compatibility with observational data. The ideology critique was not just past tendency for science to ignore empirical evidence. Even in the current climate, any theory that supports sexist or racism is often rejected outright without any objective verification. For example, several states in U.S.A. refuse to teach Darwinian theory of evolution in biology class in favour of Christian creationist's belief.

How auxiliary hypothesis, paradigm and contextual value influence the faculty of reason illustrates how the tyranny of 名色 (nama-rūpa) makes it impossible for us to comprehend the mind-independent reality as it anyway is. Although useful, sometimes accepting a socially accepted fundamental view of the world hinders understanding of nature. In the past, 名色 (nama-rūpa) such as Empedocles' five fundamental elements[54], Newton's laws of motion and ether prevent scientists from understanding things as they are and led them to false theories. Although analytically, the problem of under-determination of theory by data can be overcome by no-miracle argument and conjunction argument, socio-historical studies prove that we cannot correctly judge truth value of a theory because of the tyranny of 名色 (nama-rūpa).

Scientific method is believed to be the most reliable method because it is objective and not influenced by unfounded assumption and personal or/and social opinion. But as we have examined, even in science theory choice is influenced directly or indirectly (through paradigm or auxiliary hypothesis choice) by personal or/and social opinion. This makes scientific knowledge to be no better than mere opinion, belief and subject to faith

1.2.3.名色 (nama-rūpa) and our inability to comprehend 寂滅 (nirvāna)

So far in this chapter, I examined two arguments which lead to epistemological scepticism that we are not capable to comprehending 寂滅 (nirvāna). The two arguments are;

[54] Empedocles of Acragas thought that everything in the universe is a compound of fire, air, water and earth. The similar view was held in India and China, too.

1) What we can experience and have knowledge of is limited to 流転 (samsāra) and we have no direct access to 寂滅 (nirvāna).
2) 流転 (samsāra) does not accurately correspond 寂滅 (nirvāna).

Regarding the second premise, 名色 (nama-rūpa) played an important role. 名色 (nama-rūpa) is a useful tool for forming experience and knowledge, but it can turn tyrannical and dominate and structure our comprehension and creates discrepancies between 流転 (samsāra) and 寂滅 (nirvāna). In the faculty of experience 名色 (nama-rūpa) distorts what we experience by influencing the process of cognition to over-interpret sensory inputs or gives rise to pseudo-experience. This itself would not be problem if the faculty of reason could provide abilities to deduce truth from incomplete sensory experience and to distinguish genuine experience from distorted one. Unfortunately, however, the faculty of reason cannot provide neither. In the faculty of reason, 名色 (nama-rūpa) is a template, framework, auxiliary hypothesis or paradigm using which we make sense of what we comprehend. Because choice of 名色 (nama-rūpa) is influenced by human convenience and interest, there is no guarantee that it provide reliable foundation upon which we can built and verify our experience and knowledge. As the result we end up with 名色 (nama-rūpa) as a content or constituent of 流転 (samsāra) which does not accurately reflect the way 寂滅 (nirvāna) actually is.

1.3. 空 (śūnyatā)

1.3.1. A paradoxical statement of the negative 空 (śūnyatā)

So what is 空 (śūnyatā), and how is it related to our inability to comprehend 寂滅 (nirvāna)? 空 (śūnyatā) is often translated as "nothingness", but Chinese and Japanese has a different word for nothingness which is 無 (pronounced "mu"). It is important for *Mādhyamika* school and Zen to distinguish it from 空 (śūnyatā). Nothingness is described using single negation (not exist) whereas emptiness is expressed as a combination of four contradicting statements called

四句 (catus-kotika)[55]. In this thesis, instead of all four statements, I will use the following formula which states the essence of 四句 (catus-kotika);

a) A is 無 (nothing); $\neg \exists x\,(x = A)$.

b) A is 空 (empty); $\exists x\,(x = A) \,\&\, \neg \exists x\,(x = A)$

The classical logic would simply dismiss the formula b) as nonsense, since it is obviously paradoxical. Classical logic considers the formula b) as paradox because it allows only two possibilities; either *x* which *A* refers to exist or not to exist. Zen would agree with classical logic that the formula b) is paradoxical. But Zen thinks the paradox illustrates a very important point. To understand the role of the paradox, we have to go beyond the literal meaning of the formula b) and to analyse the intention of its usage. The paradox is used to demonstrate that *A* is an *empty noun* or an *empty concept* that does not correspond to anything in 寂滅 (nirvāna). If *A* is an empty noun or concept, then neither "A exists" nor "A does not exist" has any truth value. Suppose we replace *A* with the nonsensical word "mbhaaa", then neither "mbhaaa exists" nor "mbhaaa does not exist" is true. But as Gangadean correctly identifies in his paper[56], the paradox does not mean *A* is nonsensical, like "mbhaa" is. *A* may be nonsensical regarding 寂滅 (nirvāna; the mind-independent reality), but it has a meaning in 流転 (samsāra; the relative reality), because *A* refers a 名色 (nama-rūpa), a constituent of 流転 (samsāra) and a tool which is used to simplify the complex affair of reality. "*A* is 空 (śūnya)" means that *A* is 名色 (nama-rūpa) and it is applicable only to 流転 (samsāra) and not to 寂滅 (nirvāna).

Why does the paradox prove such points? The answer lies in a fact that *A*, 名

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[55] Four statements are

1; $\exists x\,(x = A)$,	A exists.
2; $\neg \exists x\,(x = A)$,	A does not exist.
3; $\exists x\,(x = A) \,\&\, \neg \exists x\,(x = A)$ and	A exists and A does not exit.
4; $\neg \exists x\,(x = A) \,\&\, \neg\,(\neg \exists x\,(x = A))$.	A does not exist and it is not true that A does not exist

[56] Gaugadean, Ashok Kumar. (1979), "Formal ontology and the dialectical transformation of consciousness", in *Philosophy East and West*, vol.29, p.21-48.

色 (nama-rūpa), is defined by a boundary or division between *A* and *not-A*. For example, the concept or word "apple" is defined by a boundary between what is apple and what is not. Only by understanding the boundary we can use the concept or the word "apple". To apprehend who "Nelson Mandela" is, we have to be able to distinguish who is and who is not Nelson Mandela. If we cannot distinguish who is and who is not Nelson Mandela, then we cannot claim to know the meaning of "Nelson Mandela" or who Nelson Mandela is. To understand a 名色 (nama-rūpa), we must understand a boundary or an identity condition (what makes object *x* but not *y* to be *A*). This process of comprehending things by applying a boundary that defines 名色 (nama-rūpa) is called 分別 (vikalpa). Chinese characters 分別 (vikalpa) literary means to separate, to discriminate and to distinguished. It is the process of separating into two categories, *A* or *not-A*. If, as this chapter has demonstrated, 名色 (nama-rūpa) is essential for forming knowledge, then understanding the boundary between *A* and *not-A* (i.e. the ability for us to 分別 (vikalpa)) is crucial for forming knowledge.

Mādhyamika school and Zen think the boundary that defines 名色 (nama-rūpa) is not applicable to 寂滅 (nirvāna) because it is not intrinsic to 寂滅 (nirvāna). This belief is demonstrated by a much-used quote;

> 如来は二辺を離れて中道によって法を説く[57]
> The *tathagata* (the enlightened) understand *dharma* (the way the reality is) to be madhyamā-ratipat (middle way) by escaping from dualistic understanding.

Escaping from bi-value understanding means that the mind-independent reality (寂滅; *nirvāna*) is beyond the distinction of *A* or not-*A*. This is the core idea of Mādhyamika school (中観派), the middle school. If the boundary between *A* and not-*A* were intrinsic, only one of *A* or not-*A* can be true, and not possible for both *A* and not-*A* to be true at the same time. For the combination, *A* and not-*A*, to be

[57] 『雑阿含経』, 十二巻 (vol.12), 『大正蔵』, 二巻, p.86, Samyutta-Nikāya (『阿含経相応部』), vol.2, p.76 and Mahāvatsu (大事), III, p.448.

true, the division between *A* and not-*A* must not be intrinsic. This derives from a Buddhist concept of *asvabhāva* (無自性). It is an idea that everything lacks *svabhāva* (self-essence or intrinsic nature). Everything we experience and comprehend is not intrinsic to reality since it is *samskrta* (有為). As I briefly mentioned *samskrta* earlier in this chapter, it means "conditioned" or "created" by us human. In this context it means that the identity condition for *nama-rūpa* is not intrinsic to the mind-independent reality (*nirvāna*) but it is a product of human invention.

What the formula "∃x (x =A) & ¬∃x (x =A)" aim to question is not whether object *x* which *A* refers exists or not. Instead it is about whether *A* inheres in the object *x* or *A* is a mere concept (名色; nama-rūpa) which we project upon *x*. The fact that Zen and the Madhyamika school believe the formula to be an accurate description of truth indicate that they believe in the latter; *A* is not intrinsic to *x*. This is why, in Zen, 如 (tathāta; suchness) "therefore indicates the world as it is unscreened and undivided by the symbols and definitions of thought."[58]

In 大乗仏教 (Mahāyāna Buddhism), 名色 (nama-rūpa) to be 無自性 (*asvabhāva*) and 有為 (*samskrta*) is often explained using 縁起 (*pratītya-samutpāda*). There are many literary evidence to connect 空 (śūnyatā) with 縁起 (*pratītya-samutpāda*).

> 縁起なるものを、われわれは空と説く。それは仮名であって、それはすなわち中道である。[59]
>
> Pratītya-samutpāda is śūnyatā, they are different names for madhyamā

Candrakīrti (月称) also commented on the close connection between *Mādhyamika* school whose central principle is *śūnyatā* (空) and *pratītya-samutpāda* (縁起). In *Madhyamakāvatāra* [60] , he identifies *Mādhyamikāh*, those who follows *Mādhyamika* school with those who thinks everything is product of

[58] Watts, Alan W. (1957), *The Way of Zen*, (N.Y.; Mentor Book), p.75.
[59] 『中論』 (*Madhyamaka-śāstra*)、XXIV, 18
[60] *Madhyamakāvatāra* 『入中論』, p.386, line4-7. It is a widely used text of Mādhyamika school, written by Candrakīrti. The translation of the title means The Entry to the Middle Way.

pratītya-samutpāda.

There is a tendency to interpret pratītya-samutpāda as causation or causal connection, especially regarding so-called twelve causal links (十二因縁). Gaudama Buddha, supposedly, attained enlightenment when he fully realised the truth of the twelve causal links which demonstrates how ignorance (無明; avidyā) gives rise to aging and death (老死; jarā-marana), two chief elements of suffering (苦; duhkha). The causal links are expressed in a simple form of "idam sati ayam bhavati" which translate as "when this exists then that arises". This phrase implies "this" to be a condition for "that" effect to happen. This is why pratītya-samutpāda is often understood as causation. Moreover, historically such interpretation coincides with Indian tradition of believing in existence of *karma* (業), causal connection between deeds in this life and position in the next life he or she will be born in. Nāgārjuna[61] fiercely criticised those who interpreted pratītya-samutpāda as causation. For Nāgārjuna and his followers, pratītya-samutpāda is comprehended as mutual dependency (idampratyayat; 相互依存) and not as causation. If *x* and *y* are in the relation of pratītya-samutpāda, *y* does not have to be caused by *x*. This is obvious from several examples. Candrakīrti worte;

> 「これがあるとき、かれがある。あたかも短があるときに長があるが如くである[62]。」
>
> "This exists thus that exists. It is like there is short only when there is long."

"Long" is not caused anyway by "short", but defining "long" requires its opponent "short". A favourite example used again and again in different texts[63] is

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[61] According to Chinese Buddhist 吉蔵 (Ch; Jí-Zàng) who is better known as 嘉祥大師 (Jp; Kajyou-taishi) in Japan, 『中論』 (*Madhyamaka-śāstra*) is a text in which Nāgārjuna clarified the differences between 縁起 (*pratītya-samutpāda*) as 相互依存 (*idampratyayat*; mutual dependence) and as 因果 (*hety-phla*; causation). The first twenty five chapters discuss 縁起 (*pratītya-samutpāda*) as mutual dependence, and last two chapter compared it with 縁起 (*pratītya-samutpāda*) as 因果 (*hety-phla*; causation)

[62] *Madhyamakāvatāra* 『入中論』、p.10, line 7.

[63] 『百論』 (Catuhśataka), 『大智度論』 (Mahāprajñāpāramitopadeśa-śāstra) vol.32, *Bodhicaryāvatāra*, IX, 114. etc.

a relation between a father and a son. Suppose two people *F* (father) and *S* (son). The existence of *S* is in a sense, caused by *F*, whereas *F* is not caused by *S* (*S* would not have existed if *F* had not existed, but it is possible for *F* not to have a child). But for the person *F* to be a "father", the existence of *S* is required, as well as *F* for *S* to be a "son". It has to be noted here that the mutual dependence discussed here is not an ontological one. It is about what things are recognised *as*;. as something "long", "short", "father", "son", etc.

Unlike other branches of Buddhism, Zen does not mention the close connection between 空 (*śūnyatā*) and 縁起 (*pratītya-samutpāda*). Nakamura[64] thought this was due to mistranslation by Kumārajīva[65] (鳩摩羅什). Kumārajīva translated *pratītya-samutpāda* as 因縁 (cause-effect) or as 因縁法 (laws of cause-effect). Because Chinese and Japanese Buddhists understood it as cause-effect and not mutual dependence, the relation between *pratītya-samutpāda* and 空 (śūnyatā) was not widely discussed in Ch'an/Zen. This, however, does not mean the relation between 空 (śūnyatā) and mutual dependence is alien to Chinese and Japanese. Surprising, the same idea was developed by Taoist completely independent from the development of *pratītya-samutpāda* in India. In 道徳論 (Tao-Te-Ching) we can find a passage;

> When everyone recognizes beauty as beautiful, there is always ugliness;
> When everyone recognizes goodness as good, there is already evil;
> "To be" and "not to be" arise mutually;
> Difficult and easy are mutually realized;
> Long and short are mutually contrasted;
> High and low a re mutually posted;...

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[64] Nakamura Hajime (1981)『仏教思想 6 - 空 (上)』(*Buddhism Philosophy Vol.6 - Śūnyatā*), (Kyoto; Heirakuji Publishing House), p.151-153

[65] Kumārajīva (344-413) One of most influential Buddhist monks who brought Buddhism from central-Asia to China. He translated many important Indian Buddhist texts into Chinese. His translations include 般若経 (Prajñāpāramitā-sūtra), 妙法蓮華経 (Saddharmapundarīka-sūtra), 維摩経 (Vimalakīrti-nirdeśa-sūtra),『中論』(*Madhyamaka-śāstra*),『百論』(Catuhśataka),『大智度論』(Mahāprajñāpāramitopadeśa-śāstra), and so forth.

> Before and after are in mutual sequence.[66]

Like the paradoxical statement of "A and not-A", the above statement indicates that Taoism also thinks *A* and *not-A* is mutually dependent because any division between *A* and *not-A* is a products of human invention. Śūnyatā (空), *pratītya-samutpāda* (縁起), *asvabhāva* (無自性) and *asamskrta* (有為) all describes the same thing that 名色 (*nama-rūpa*) is defined by human values and social consensus and it is not determined by the way the 寂滅 (nirvāna) actually is. What this means is that 名色 (nama-rūpa), everything we experience and comprehend, belong to 流転 (samsāra) and not 寂滅 (nirvāna). In other words, 寂滅 (nirvāna) is devoid of everything we experience and comprehend.

1.3.2. Everything is 空 (śūnya)

We have so far examined what 空 (śūnyatā) is and its plausibility. This section looks into what sort of thing Zen consider to be 空 (śūnya). There is one Zen Buddhist text above all others makes an extent list of things that are 空 (śūnya). The texts is 般若心経 (Prajñā-pāranitā-sūtra) which is sometime known as *Heart Sūtra*. The second paragraph starts as followed;

> 色不異空、空不異色、色即是空、空即是色、受想行識亦復如是
> Rūpa is not different to śūnyatā, śūnyatā is not different to rūpa, rūpa is just śūnyatā, śūnyatā is just rūpa. The same [śūnyatā] applies to vedana-skandha, samjñā-skandha, samskāra-skandha and vijñāna-skandha.

The passage states that all 五蘊 (five skandhas) are 空 (śūnya) and they do not belong to 寂滅. Then, the sutra continues to identify, 六識 (six vijñānas), 六根 (six indriyas) and 六境 (six visayas) to be 空 (śūnya) as well.

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[66] 道徳論 (Tao-Te-Ching), 2. I use a version quoted in Watts, Alan. (1957), The Way of Zen, (N.Y.; Mentor Books), p.116.

是故空中...無眼耳鼻舌身意、無色聲香味觸法、無眼界乃至、無意識界

...in the state of śūnyatā... there is no eye, ear, nose, tongue, body and mind [six indriyas that arise experience), there is no form, sound, smell, taste, bodily sensation, nor any laws of nature [six visayas; attributes of what we experience], there is no sphere of visual attributes and no sphere of mental attributes.

These passages state that every content or constituent of our experience and knowledge is 空 (śūnya). In other words, they indicate that everything we experience and comprehend belong to 流転 (samsāra) and not 寂滅 (nirvāna). The sūtra then talks about 空 (śūnyatā) of various 名色 s (nama-rūpas) that function as tools.

不生不滅、不垢不浄、不増不減

There are neither appearing nor disappearing, neither dirty nor pure, neither increasing nor decreasing.

The passage denies all bi-value or oppositions between A or not-A. They are all 空 (śūnya). they are 有為 (samskrta), products of human invention and 無自性 (asvabhāva), not intrinsic to 寂滅 (nirvāna). The sūtra mention only six oppositions, but different texts denies different sets of oppositions. For example, Nāgārjuna recognised eight. Three additional divisions are between same and different and temporal and permanent. Regardless of different numbers of oppositions, they are all criticisms against all of our bipolar understanding of sorting things into A or not-A. Other things the sūtra describes as 空 (śūnya) are the ignorance (無明; avidyā), aging (老; jāra), death (死; marāna), the Four Noble Truth (四聖諦; catur-ārya-satya) and so forth. They all indicate 空 (śūnya) of 縁起 (pratītya-samutpāda) which I will discuss in Chapter Seven. Basically the sūtra states every possible 名色 (nama-rūpa) to be 空 (śūnya); including both

名色 s (nama-rūpas) as contents of experience and knowledge and 名色 s (nama-rūpas) as tools according to which experience and knowledge are formed.

1.4. Conclusion.

This chapter examined our inability to comprehend 寂滅 (nirvāna) and 空 (śūnyatā). They simply means the same thing. We are not capable of comprehending 寂滅 (nirvāna) because 名色 (nama-rūpa), the content or constituent of our experience and knowledge, is 空 (śūnya). 空 (śūnyatā) is the idea that division which defines 名色 (nama-rūpa) is 有為 (samskrta) a product of human convention and not reflecting 自性 (svabhāva), intrinsic nature of 寂滅 (nirvāna). I recognised that both the inability to comprehend 寂滅 (nirvāna) and 空 (śūnyatā) of 名色 (nama-rūpa) are results of the tyranny of 名色 (nama-rūpa). Because our sensory and mental capacities are limited, 名色 (nama-rūpa) is a useful tool for simplifying what we experience and comprehend. It works as a template to sort things out into simple A or not-A categories or works as paradigm or auxiliary hypothesis to provide a foundation or a framework upon which a theory and understanding can be formed. But it can turn tyrannical and not only dominate and structure our thought but also creates illusion (幻;māyā) and makes us see things in a wrong way (顛倒; viparyāsa).

The relation between the inability to comprehend 寂滅 (nirvāna) and tyranny of 名色 (nama-rūpa) is circular. The tyranny prevent us from apprehending 寂滅 (nirvāna) as it actually is, but at the same time the cause of the tyranny is our inability to comprehend 寂滅 (nirvāna). Since we are not capable to comprehend 寂滅 (nirvāna) as it is, it cannot be 寂滅 (nirvāna) that determines the meaning and extension of 名色 (nama-rūpa). The tyranny occurs because 名色 (nama-rūpa) does not correspond to the way 寂滅 (nirvāna) actually is. We cannot understand the way 寂滅 (nirvāna) actually is using such 名色 (nama-rūpa).

To understand this circular process is very important for the purpose of this thesis, because, as I will discuss in the next chapter, it will liberate us from not

only 幻 (māyā) and 顚倒 (viparyāsa) but also from 苦 (duhkha).

2

Positive 空 (śūnyatā)

2.1. Possible consequences of the negative 空 (śūnyatā)

We have so far examined the negative sense of 空 (śūnyatā). The negative interpretation of "everything is 空 (śūnya)" implies scepticism that everything we experience or comprehend is 幻 (māyā; illustion) and 顚倒 (viparyāsa; misapprehension). This negative interpretation of 空 (śūnyatā) seems to imply nihilism. And there are scholars such as Poussin[1] and Dasgupta[2] who assume Madhyamika and Zen to be such. But as Garfield points out nihilism is "in a straightforward sense, sick[3]." If we regard all concepts and knowledge to be an illusion (幻; māyā), then we lose any regularity and a standard necessary for us to carry out everyday life. For example, when someone asks whether it is raining outside or not, the nihilist always has to reply "I do not know" even though he can see outside through his window. Instead, for Buddhism, scepticism is "a form of philosophical therapy, to cure us of the cognitive and emotional ills born of extreme metaphysical, moral, or epistemological positions.[4]" So what is 空 (śūnyatā) supposed to cure, what is the positive implication of the scepticism? Zen thinks 空 (śūnyatā) cures 幻 (māyā) and 顚倒 (viparyāsa) and brings about 智慧 (prajñā), the ultimate knowledge. The obvious question is how can such conflicting positions be combined? As I stated in the introduction of the Part One, the key to solve this problem is 悟 (bodhi), the enlightenment. For the

[1] Poussin, Louis de la Vallee, "Buddhism", p.186
[2] Dasgupta S. (1930), *History of Indian Philosophy Vol.1*, (Cambridge; Cambridge Univ. Press), p.138.
[3] Garfield, Jay L. (1990), "Epoche and Śūnyatā: Slepticism East and West," in *Philosophy East and West*, vol.40, p.286.
[4] Garfield, Jay L. (1990), ibid. p.285.

unenlightened, everything is 空 (śūnya) means experience and knowledge are 幻 (māyā) and 顚倒 (viparyāsa). Whereas for the enlightened, everything is 空 (śūnya) leads to liberation from 幻 (māyā) and 顚倒 (viparyāsa) and attainment of 智慧 (prajñā). So what is 悟 (bodhi) and how does it make possible for us to overcome 幻 (māyā)?

2.1.1. 悟 (bodhi) and 智慧 (prajñā)

The Popular Buddhism often assumes 悟 (bodhi) to be some mystical superhuman experience of omniscience. What inspires such interpretation of 悟 (bodhi) is extraordinary ability of the enlightened to pay attention to even insignificant details. This ability is not, however, the result of omniscience but of what is called "every minute Zen". Zen believes that there is no same moment twice, therefore, every moment is a precious moment and one should never waste time and chance. This is an idea behind the motto of the Japanese tea ceremony 一期一会 (this time is the last time to meet). We have to pay attention to every thing we do, because it is the only chance we have, and we cannot go back in time and try again. Soyen Shaku taught his students; "Watch what you say, and whatever you say, practice it. When opportunity comes do not let it pass, yet always think twice before acting."[5] This is why the enlightened one can recall things they have experienced much better than us the unenlightened. The following story illustrates this point:

=Every-Minute Zen=

> Zen students are with their masters at least ten years before they presume to teach others. Nan-in was visited by Tenno, who, having passed his apprenticeship, had become a teacher. The day happened to be rainy, so Tenno wore wooden clogs and carried an umbrella. After greeting, Nan-in remarked; 'I suppose you left your wooden clogs in the vestibule. I want to know if your umbrella is on the right or left side of the clogs.'

[5] Rep, Paul. (1957), *Zen Flesh Zen Bones*, (London; Penguin Books), p.36.

> Tenno, confused, had no instant answer. He realized that he was unable to carry his Zen every minute. He became Nan-in's pupil, and he studied six more years to accomplish his every-minute Zen.[6]

If 悟 (bodhi) is not a mystical omniscience experience, what sort of experience is it? Some suggests 悟 (bodhi) is comprehension without influence of 名色 (nama-rūpa). As we learned in the Chapter One, although 名色 (nama-rūpa) is a useful tool for forming and making sense of experience and knowledge, it can turn tyrannical and creates 幻 (māyā). Therefore the way to stop 幻 (māyā) is getting rid of the influence of 名色 (nama-rūpa). Gangadean described 悟 (bodhi; the enlightenment) as a transformation which he calls "transformational dialectic."

> [It] purports to move consciousness beyond any and all conceptual structures, beyond any form of discourse, beyond any natural or philosophical language, beyond any ontology.[7]

What he described as conceptual structure, form of discourse and so forth are exactly what 名色 (nama-rūpa) provides. Nakamura[8] makes comparison between the enlightened mind and a mirror to describe the relation between liberation from 名色 (nama-rūpa) and comprehension of 寂滅 (nirvāna). Only a clean mirror can reflect things accurately, and a mirror would not accurately reflect what is in front of it if the mirror were already clogged by marks, colours and so forth. In the same way, only a mind which is not clogged by 名色 (nama-rūpa) can accurately correspond 寂滅 (nirvāna). This interpretation of 悟 (bodhi) as liberation from 名色 (nama-rūpa) seems to coincide with some of

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[6] Rep, Paul. (1957), ibid., p.43.
[7] Gangadean, Ashok Kumar. (1979), "Formal ontology and the dialectical transformation of consciousness", in *Philosophy East and West*, vol.29, p.22.
[8] Nakamura Hajime (1981), 『仏教思想6 –空 (上)』(*Buddhist Philosophy Vol.6 –Śūnyatā*), (Kyoto; Heirakuji Publishing House), p.65

Zen's mottos such as 不可説[9] (*anabhilapya*), 不立文字[10] (Jp; *furyū-monnji*) and 只管打座[11] (Jp; *shikan-taza*). They all describe that the absolute truth cannot be put into words. If absolute truth is beyond the capability of 名色 (nama-rūpa), then 悟 (bodhi) must be the ability to go beyond capability of language. This interpretation, however, faces a serious difficulty. The difficulty is the impossibility to get rid of 名色 (nama-rūpa) from experience and knowledge. As we have seen in the section 1.1.2, 名色 (nama-rūpa) is strongly related to experience and knowledge in two ways; as a content and constituent of experience and knowledge and as a tool according to which experience and knowledge are formed. Since we are not capable of experiencing 寂滅 (nirvāna) directly, what we can experience and have knowledge of are inevitably 名色 (nama-rūpa) as the content. There is nothing other than 名色 (nama-rūpa) we can experience and comprehend. 名色 (nama-rūpa) as the tool is also impossible to get rid of. As we learned in Section 1.2.2.1.b, cognition, the process of how 名色 (nama-rūpa) influences experience, is not something we can intentionally switch off. This means that the influence of 名色 (nama-rūpa) cannot be eliminated, at the faculty of experience. In the faculty of reason, it is not possible to form and verify theory and belief without some framework or foundation that 名色 (nama-rūpa) as a paradigm or auxiliary hypothesis provide. This leads to a conclusion that even if one has attained 悟 (bodhi), it is not possible to prevent 名色 (nama-rūpa) from influencing our experience and knowlegde and causing the tyranny of 名色 (nama-rūpa) to make our experience and knowledge to be 幻 (māyā) and 顛倒 (viparyāsa).

For Zen, 悟 (bodhi) is considered to be a much more down-to-earth experience rather than an omniscience experience or comprehension without 名

[9]Japanese words 不可説 (Jp; fukasetsu) can be translated to three Sanskrit words *anabhilapya, nirabhilāpya* and *avācya*. It describe the concept of 空 (śūnyatā) that the absolute truth cannot be captured by any language.

[10] "No word can be describe anything". It is Ch'an/Zen's belief that 悟 (bodhi) cannot be achieved though texts, because words cannot capture the way 寂滅 (nirvāna) actually is.

[11] "Just sitting". This is the principle motto of Japanese Sōtō school of Zen. It is an idea that ultimately only through sitting meditation we can discover Buddhahood that exists in everyone of us.

色 (nama-rūpa). In Zen, 悟 (bodhi) is understood as simply as truly awakening to the fact that everything is 空 (śūnya). Zen believes such an awakening experience enables the enlightened to defeat 幻 (māyā) and 顛倒 (viparyāsa). This claim seems to contradict what we learned in Chapter One and what I stated above that our experience and knowledge are inevitably 幻 (māyā) and 顛倒 (viparyāsa). The key to solve this contradiction is recognising two kinds of 幻 (māyā) and 顛倒 (viparyāsa) the unenlightened suffer from. The first kind is the direct result of the tyranny of 名色 (nama-rūpa). 名色 (nama-rūpa) works as a tool like a template or a framework according to which we can simplify and sorting out what we experience and comprehend. But since 名色 (nama-rūpa) is 有為 (samskrta) and it does not reflect the way 寂滅 (nirvāna) is, any experience and knowledge that is formed using of the 名色 (nama-rūpa) as a tool inevitably does not reflect the way 寂滅 (nirvāna) is. This is why what we experience and comprehend are 幻 (māyā) and 顛倒 (viparyāsa) that do not correspond to 寂滅 (nirvāna). Zen thinks this kind of 幻 (māyā) and 顛倒 (viparyāsa) is not a serious problem. The true problem is the second kind of 幻 (māyā) and 顛倒 (viparyāsa) which the unenlightened suffered from. The second kind is 幻 (māyā) and 顛倒 (viparyāsa) of believing the opposite of the first kind. The unenlightened falsely believe 名色 s (nama-rūpas) to accurately reflect 寂滅 (nirvāna), and using such tools it is possible to comprehend 寂滅 (nirvāna) as it actually is. The unenlightened suffer from not only the first kind of 幻 (māyā) and 顛倒 (viparyāsa) but also the second kind, so that they are not aware of the fact that their experience and knowledge are 幻 (māyā) and 顛倒 (viparyāsa). It may not be possible to overcome the first kind of 幻 (māyā) and 顛倒 (viparyāsa), but it is achievable to eliminate the second kinds of 幻 (māyā) and 顛倒 (viparyāsa). This is what 悟 (bodhi) does. 悟 (bodhi), which is the comprehension of 名色 (nama-rūpa) to be 空 (śūnya), liberates us from the false belief in our experience and knowledge to genuinely reflect 寂滅 (nirvāna). 悟 (bodhi) makes us realise that we actually do not understanding anything about

寂滅 (nirvāna; the mind-independent reality).

2.1.2 Positive consequences of 悟 (bodhi)

悟 (bodhi) as a simple realisation of everything we experience and comprehend to be 幻 (māyā) and 顛倒 (viparyāsa) does seem nihilistic and not positive. So why is 悟 (bodhi) regarded as bliss or the goal of practicing Zen? It is bliss and the goal of Zen, because the realisation enables the enlightened to make peace with 名色 s (nama-rūpas) and liberate us from 苦 (duhkha).

For the unenlightened, 名色 (nama-rūpa) is a tool that controls experience and knowledge and causes 幻 (māyā) and 顛倒 (viparyāsa). Whereas for the enlightened, 名色 (nama-rūpa) is 空 (śūnya) yet it is a useful tool for simplifying what we experience and comprehend. To expand the metaphor of a tool, in order to clarify Zen's position comparing to realism and nihilism, realists falsely believe that the tool does what it is supposed to do (i.e. using which they can comprehend 寂滅 (nirvāna)). Or at least, realists believe it is possible to obtain a perfect tool, using which they can comprehend 寂滅 (nirvāna) as it really is. They therefore suffer from the fist kind of 幻 (māyā) and 顛倒 (viparyāsa) as well as the second; their experience and knowledge are 幻 (māyā) and 顛倒 (viparyāsa), but they falsely believe otherwise. Nihilism is the opposition of the realism stated above. Nihilists recognise that the tool not only fails to do what it is supposed to do but also it turns tyrannical and gives a false sense of security. In order to avoid both kinds of 幻 (māyā) and 顛倒 (viparyāsa), nihilists refused to use the tool and give up any attempt to comprehend 寂滅 (nirvāna). The enlightened neither seek a better tool nor reject the existing tool. He is content to use the existing tool as he is fully aware that he can never attain the perfect tool that corresponds exactly the way 寂滅 (nirvāna) is. The difference between nihilism and realism on one hand and the enlightened on the other is that the former assume "in order for words and statement to be meaningful or true, they must correspond to an independent, unconditioned

realm[12]", whereas the enlightened understand 名色 (nama-rūpa) to be 有為 (samskrta) and 無自性 (asvabhāva). The understanding of 名色 (nama-rūpa) to be 空 (śūnya) removes false hope or illusion about 名色 (nama-rūpa), so that the enlightened can use it as it actually is. One possible interpretation to why the enlightened can be content with 名色 (nama-rūpa) is that the enlightened use 名色 (nama-rūpa) to describe 流転 (samsāra; the relative reality) and not 寂滅 (nirvāna; the mind-independent reality) which is beyond the capability of 名色 s (nama-rūpas). This interpretation, however, contradicts some statements by the enlightened that describe how calm nirvāna is. For I am not an enlightened one, unfortunately I cannot say exactly why and how enlightened make peace with 名色 (nama-rūpa).

The second and more important positive consequence of realising all experience and knowledge to be 幻 (māyā) and 顛倒 (viparyāsa) is that it enables the enlightened to be liberated from 苦 (duhkha). In Zen, 苦 (duhkah) is defined as the feeling of dissatisfaction and unfulfillment of craving and desire. But how does realisation of everything to be 空 (śūnya) and all experience and knowledge to be 幻 (māyā) and 顛倒 (viparyāsa) enables the liberation from 苦 (duhkha). The answer lies in the Buddhist concept of 縁起 (pratītya-samutpāda). 縁起 (pratītya-samutpāda) explains how 無明 (avidyā), unawareness of our experience and knowledge to be 幻 (māyā) and 顛倒 (viparyāsa), leads to 苦 (duhkha). 苦 (duhkah) is a result of the false belief in existence of 我 (ātman; self as an individual independent being) and existence of objects and comfort which an individual craves and desires for. Like any other thing which the unenlightened believe to exist in 寂滅 (nirvāna), the self (individual) and the objects of desire are both 名色 (nama-rūpa) that are 空 (śūnya). In other words, there is nothing (or no one) that possess cravings and desire and there is nothing an individual craves and desire for. The unenlightened suffer from 苦 (duhkha) because chasing things that do not exist in the first place only leads to failure. Because 苦 (duhkha) is the result of falsely believing that an individual who

[12] Cooper, David (2002), *The Measure of Things*, (Oxford; Clarendon), p.303

craves and object he craves for exist in 寂滅 (nirvāna), the realisation that they are 空 (śūnya) annihilates 苦 (duhkha). By realising that these things to be 空 (śūnya) a person would no longer feel desire and craving for them.

2.1.3. 悟 (bodhi) as true realisation

If 悟 (bodhi) simply means understanding 名色 (nama-rūpa) to be 空 (śūnya), then any readers of this thesis can claim to be the enlightened one. But unfortunately, this is not the case. One important aspect of 悟 (bodhi) is that it has to be a *true realisation* of 空 (śūnyatā) and it must be distinguished from intellectual understanding or analytical comprehension. According to Takagami[13], Zen recognises three kinds of understanding; 聞慧 (śruta-prajñā), 思慧 (cintā-prajñā) and 修慧 (bhāvanā-prajñā). 聞慧 (śruta-prajñā) is second-hand understanding; understanding derived from reading or listening to others' experience of 悟 (bodhi). 思慧 (cintā-prajñā) is understanding based on analytical reasoning. These two kinds of understanding constitute intellectual understanding. These have to be distinguished from the third kind of understanding called 修慧 (bhāvanā-prajñā) which is the "true realisation" of 空 (śūnyatā). 修慧 (bhāvanā-prajñā) is understanding that arises from within. The difference between the three can be illustrated by different ways of figuring out how a passion fruit tastes. We can ask people who have tasted it or we can analyse chemical components (fruit acid, fructose, vitamin-C, etc.) to find out what it tastes like. But these methods do not provide true understanding of the taste of a passion fruit. The only way one can truly understand its taste is by actually tasting it. Actually tasting a passion fruit gives true understanding of its taste. In the same way 修慧 (bhāvanā-prajñā) is true realisation beyond intellectual understanding.

The other reason which 修慧 (bhāvanā-prajñā) has to be distinguished from intellectual understanding is that only through 修慧 (bhāvanā-prajñā), the liberation from 苦 (dukha) is possible. Even if one intellectually understood that both self as an individual that possesses desire and craving and an object which he

[13] Takagami, Kakushou. (1933),『般若心経講義』in 「世界教養全集 10」, (東京; 平凡社), p.138.

craves and desires for are 空 (śūnya), he could still feel craving and desire. Whereas if one understood these things to be 空 (śūnya) in the sense of 修慧 (bhāvanā-prajñā), he would not feel any craving or desire thereby liberated from 苦 (duhkha). This is similar to the understanding of forbidden love. Suppose you feel desire toward a friend's wife or girlfriend. Even if you intellectually understood that it is wrong to desire her, it would not stop the emotion. In the same manner, even we analytically understand both subject (self that feels desire) and object (what self feel desire for) are 空 (śūnya), we cannot stop feeling the craving and attachment, thereby not being liberated from 苦 (dukha).

Since I have not yet attained 悟 (bodhi), I do not know what experience of 修慧 (bhāvanā-prajñā) is like other than it is beyond intellectual comprehension. Neither can I defend the possibility of 修慧 (bhāvanā-prajñā). The only reason for me to believe in the possibility is because of various stories talking about the Zen masters being liberated from 名色 (nama-rūpa) and 苦 (dukha). Unfortunately I have to leave these questions regarding 修慧 (bhāvanā-prajñā) unanswered.

The intellectual understanding of everything we experience and comprehend to be 空 (śūnya) is not 悟 (bodhi). 悟 (bodhi) is "true realisation", 修慧 (bhāvanā-prajñā), of everything to be 空 (śūnya). This may suggest 聞慧 (śruta-prajñā) and 思慧 (cintā-prajñā) to be totally unnecessary. This is why many critiques wrongly consider Zen to be anti-analytical, at the best, cheap-intuitionism or anti-intellectualism at the worst. Contrary to this widely held view, Zen thinks analytical enquiry is a necessary process in order for one to truly realise 悟 (bodhi; the enlightenment). Analytical enquiry itself does not reveal the world as it really is, but it is the necessary preparation stage for the attainment of 悟 (bodhi). I will discuss this point in the next section.

2.1.4. The three levels of comprehension

So far I have analysed what 悟 (bodhi) is and the positive consequence of 悟 (bodhi). In this section I examine how and what process it takes for the

unenlightened to attain 悟 (bodhi). Understanding the process is important because it clarifies the purpose and methodology of this thesis, that sustaining all metaphysical beliefs is the necessary step toward attaining 悟 (bodhi). The process of how a person can change from the unenlightened to the enlightened is demonstrated by a famous statements made by a Chinese Zen master Wei-hsin[14]. When he was asked about his experience of attaining 悟 (bodhi) he explained it in a following manner;

> Thirty years ago, before I began the study of Zen, I said 'Mountains are mountains, waters are waters.'
> After I got an insight into the truth of Zen through the instruction of a good master, I said 'Mountains are not mountains, waters are not waters.'
> But now, having attained the abode of final rest, I say 'Mountains are really mountains, waters are really waters.'[15]

To understand Wei-hsin's statements we must understand that there are two senses of mountain in his statements; one is a *definite description* (Mountain-d) and the other is a *general term* (Mountain-g). Roles and functions of a definite description and a general term are different. A role of the definite description is to pick up a certain particular, and it is possible to replace it with an indexical term such as "this" or "that". The general term, on the other hand, cannot be replaced with a simple indexical term, because it refers 名色 (nama-rūpa) which includes various concepts such as "a natural elevation of earth surface", "some are volcanic", "Chinese believes some mountains are sacred", "view from the top is normally spectacular" etc. A general term refers 名色 (nama-rūpa) a template using which we can label different geological structures into two categories; mountains or not-mountains.

The first stage is the unenlightened stage. As an unenlightened, Wei-hsin

[14] 青原惟信 (Ch'ing-yüan Wei-hsin; Ch) (Siegen Ishin; Jp) Chinese Buddhist monk in T'ang dynasty.
[15] Extracted from Abe, M. (1985), *Zen and Western Thought*, (Honolulu; Univ. of Hawaii Press.) p.4

suffered from both kinds of 幻 (māyā) and 顚倒 (viparyāsa). He hold the first kind of 幻 (māyā) and 顚倒 (viparyāsa) that 名色 (nama-rūpa) reflects the intrinsic nature of 寂滅 (nirvāna). This leads to the second kind; false belief in our ability to comprehend 寂滅 (nirvāna) using 名色 (nama-rūpa). Because of these false beliefs, his understanding was trapped by 名色 (nama-rūpa). He could understand things only by sorting out into mountain-g or not-mountain-g and water-g and not-water-g. This is why he identified the geological structure, mountain-d with 名色 (nama-rūpa), mountain-g.

The second stage is a sceptic stage in which he recognised that he could not understand anything about 寂滅 (nirvāna) using 名色 (nama-rūpa). He realised that identifying mountain-d with mountain-g leads to 幻 (māyā) or 顚倒 (viparyāsa), because certain truth about mountain-g were not applicable to mountain-d. In other words, he comprehended that mountain-d should not be identified with mountain-g. In this sense he almost attained 悟 (bodhi), since he was able to comprehend 名色 (nama-rūpa) to be 空 (śūnya) and recognise two kinds of 幻 (māyā) or 顚倒 (viparyāsa) that the unenlightened suffers from. But unfortunately, he had not truly realised 名色 (nama-rūpa) to be 空 (śūnya). He may have intellectually grasped 空 (śūnyatā) in the senses of 聞慧 (śruta-prajñā) and 思慧 (cintā-prajñā) and not in terms of 修慧 (bhāvanā-prajñā). He had not yet made peace with 名色 (nama-rūpa) because his understanding was still trapped by 名色 (nama-rūpa); he did not know any other way to understand things other than dividing things into mountain-g or not-mountain-g. This is proven by Wei-hsin's second statement which is a simple negation "x is not-A". If this had been 悟 (bodhi), the true realisation of 名色 (nama-rūpa) to be 空 (śūnya), the second statement would had taken a form of the paradoxical statement of "x is A and not-A".

The third stage is the enlightenment stage. He truly realised 空 (śūnyatā) of 名色 (nama-rūpa) and had no illusion to what a 名色 (nama-rūpa) is. This enabled him to use mountain-g to describe mountain-d. The first and the third statement appeared to be identical, but how he understood mountain-g was

different. In the first stage, he was unaware that mountain-g is 空 (śūnya), whereas he was fully aware of this fact in the third stage. The first statement simply meant mountain-d is mountain-g whereas the third statement means both moutain-d is mountain-g and mountain-d is not-mountain-g are equally true regarding 寂滅 (nirvāna), but as the matter of social consensus and convenience, he called it mountain-g.

The alternative way to understand the third statement to Zen idea of 直指人心 (Jp; chokushi-jinnshinn; direct pointing). It is the idea to interpret Wei-hsin's third statement as "mountain-d is mountain-d", in other words it simply meant "this is this" (i.e. the mountains he saw in front of him was nothing more or less that what he saw). The "direct pointing" is a preferred method used by many Zen masters to transmit his understanding of 空 (śūnyatā).

> 教外別傳、不立文字、直指人心、見性成仏。
> Outside teaching; apart from tradition.
> Not founded on words and letters.
> Pointing directly to the human mind.
> Seeing into one's nature and attaining Buddhahood.[16]

The direct pointing is a way to avoid relating our understanding with 名色 (nāma-rūpa). By stating simply "this is this", there is no room for the tyranny of 名色 (nāma-rūpa) to set in.

What is important to notice is the existence of the sceptic stage between the unenlightened and the enlightened. In Mādhyamika schools and consequently in Zen, it is widely believed that attainment of 悟 (bodhi) is only possible by rejecting everything we believe to know. In other words, only through a sceptical attitude toward our experience and knowledge it is possible to attain 悟 (bodhi). As I quoted Garfield in the beginning of this chapter, scepticism is considered to be the cure for our false understanding of reality. The previous section dealt with three different kinds of understanding and concluded that intellectual

[16] Watts, Alan W. (1957), ibid., p.93.

understanding of 空 (śūnyatā), which composed of 聞慧 (śruta-prajñā) and 思慧 (cintā-prajñā), is not 悟 (bodhi). But these two kinds of understanding are essential for reaching the sceptical stage. In Chakrabarti's words, Nāgārjuna and followers of Mādhyamika believe "the answer dawns on you through silence following a reasoned refutation of all metaphysical views"[17]. The phrase "reasoned refutation" indicates denial of metaphysical views using 聞慧 (śruta-prajñā) and 思慧 (cintā-prajñā). The analytical enquiry into our experience and knowledge enables us to reach the sceptic stage and consequently preparing us to reach 悟 (bodhi). Takagami makes a comparison between intellectual understanding and a boat to explain the relation. Buddhism famously refers attainment of 悟 (bodhi) as "to reach the other shore (到彼岸; pāramitā)". A boat is required in order for us to get to the other shore, but importantly, once we have reached the other shore, the boat is no longer needed. There is no need to carry round the boat on the other shore, and carrying it only hinders the progress we can make on the other shore. In the same manner, rejection of what we believe to know through intellectual analysis is needed for the preparation to reach 悟 (bodhi), but intellectual understanding does not reveal the true understanding of 悟 (bodhi).

There are different opinions among Buddhists about the process of transformation from the unenlightened stage to enlightenment stage. Many Ch'an/Zen masters believe the transformation to be sudden and without the sceptic stage, whereas others, Wei-hsin among them, believe in a gradual transformation which contains the sceptic stage. I think that even though some attainment of 悟 (bodhi) appear to be sudden, the second stage existed without the person realising it. According to Hadamard[18], no inspiration or understanding derives suddenly without the period of wondering or struggling to find solution. He explains that even what appear to be sudden inspiration and apprehension are always preceded by a subconscious *incubation* period of ideas. The only reason

[17] Chakrabarti, Arindam (1995), "Metaphysics in India" in Kim, Jaegwon & Sosa, Ernest (eds.), *A Companion to Metaphysics*, (Oxford; Blackwell), p.319.
[18] Hadmard, J. (1945), *An Essay on the Psychology of Invention in the Mathematical Field*, (Cambridge M.A.; Princeton University Press).

we perceive some inspiration and understanding to be sudden is that the preceding thought process was carried out not consciously but in subconscious without us being aware of it. Hadamard uses many examples mainly from the field of mathematics but also from science to prove this point. Let me put two of his favourite examples, the way Poincaré discovered Hook's function and group and Kekulé's discovery of the structure of carbon. Poincaré discovered similarities between transfomations of Hook's function and of non-Euclid when he stepped onto a horse carriage while he was not consciously thinking about them. Although his discovery seemed promising he struggled to prove it without any success. The answer came suddenly as the later time, while walking on a beach after giving up on the problem. In neither occasion he was consciously thinking about the problem. Similarly, the answer to the mystery of why carbon react certain way, came to Kekulé in his dream. After many failed attempts to solve the mystery, he dreamed a snake which swallowed its own tail. This gave him the idea that carbon atoms form closed hexagonal shape rather than open chain. These discoveries were not the results of accidents that came out of nowhere. If that were the case, anyone could discovered these things. The reason these discoveries occurs to Poincaré and Kekulé and not anyone else was they had thought about these problems beforehand, and their minds had continued to tackled the problem subconsciously. In the same manner although the attainment of 悟 (bodhi) appears to be sudden without the second stage, the attainment is preceded by the second stage, the sceptical apprehension the experience and knowledge. In other words, unless a person has questioned the ability of 名色 (nama-rūpa) to accurately reflect 寂滅 (nirvāna), he would not come to the true realisation that every 名色 (nama-rūpa) is 空 (śūnya).

According to Zen, once a person has reached the sceptical stage, a fairly insignificant thing or event can enable him to the attainment of 悟 (bodhi). There are many stories in Zen where persons suddenly attain 悟 (bodhi) from ordinary experience. Banzan attained 悟 (bodhi) when he heard a butcher saying "everthing in my shop is the best" and Chiyono realised 空 (śūnya) of everything when a pail broke and spilled water. What did they see in the butcher's statement

and the broken pail? How did such experiences enable them to attain 悟 (bodhi)? The process was explained in Dōgen's remark about a bamboo; "the entire universe manifests itself in...a tall bamboo tree."[19] What did Dōgen experience when he saw the bamboo? His apprehension of the bamboo to be 空 (śūnya) made him realised that not only bamboo but everything he experienced and comprehended was 空 (śūnya). It is similar to Newton's experience of the falling apple. What Newton experienced was not only that the apple fell, but also underline principle of gravity that applies to everything in the universe. The difference between Newton's experience and experience of the enlightened is that the former is affirmation, whereas the latter is neither affirmation not negation.

2.1.5. The summary of the positive 空 (śūnyatā)

The Chapter One concluded that because of the tyranny of 名色 (nama-rūpa) we are not capable of comprehending 寂滅 (nirvāna), everything we experience and comprehend is inevitably 幻 (māyā) or 顛倒 (viparyāsa). Yet, Zen thinks it is possible to overcome 幻 (māyā) and 顛倒 (viparyāsa) by attaining 悟 (bodhi). This leads to the questions of what is 悟 (bodhi) and how does it make it possible to combine the two opposing positions regarding our experience and knowledge? These two opposing views are compatible because Zen recognises two kinds of 幻 (māyā) and 顛倒 (viparyāsa). The first kind is our experience and comprehend that do not correspond 寂滅 (nirvāna). What we experience or comprehend is said to be 幻 (māyā) and 顛倒 (viparyāsa), because it does not correspond the way 顛倒 (viparyāsa) actually is. The second kind composed of two false beliefs. One is false belief that 名色 (nama-rūpa) genuinely reflects 寂滅 (nirvāna). This generates the other false belief that we are capable to comprehend 寂滅 (nirvāna). The unenlightened suffers from both kinds of 幻 (māyā) and 顛倒 (viparyāsa). They do not comprehend the way 寂滅 (nirvāna) is, but falsely believe that they do. 悟 (bodhi) does not enable a person to be liberated from the first kind, but at least it get rid of the second kind

[19] Dōgen, Shobogenzo, II 89.

幻 (māyā) and 顚倒 (viparyāsa).

Relating to the distinction between the enlightened and unenlightened, there are two levels of truth called 世俗 (samvrti-satya; mundane truth) and 勝義 (paramārtha-satya; absolute truth) as well as two kinds of knowledge, 愚癡 (maho; mundane knowledge) and 智慧 (prajñā; the ultimate knowledge). 世俗 (samvrti-satya) and 愚癡 (maho) are what pragmatists think as truth and knowledge; they are defined as a matter of convenience and social agreement and not defined by the way the mind-independent reality anyway is. 智慧 (prajñā) is often considered to be the ultimate knowledge of 寂滅 (nirvāna) as it really is, but as we have learned because experience and knowledge are limited to 流転 (samsāra) it is not possible even for the enlightened to understand 寂滅 (nirvāna) as it really is. Instead, I believe 智慧 (prajñā) is simply an apprehension of 愚癡 (maho) to be 幻 (māyā) or 顚倒 (viparyāsa). 勝義 (paramārtha-satya) is the truth of 空 (śūnyatā) that everything is neither *A* nor *not-A*, (i.e. the truth is beyond the bi-polar nature of 名色 (nama-rūpa), thereby 中道 (madhyamā; the middle way)). This raised a question of why such comprehension is considered to be positive rather than nihilistic. I answer this question by explaining that it allows the enlightened to be in peace with 名色 s (nama-rūpas) and to be liberated from 苦 (dukha).

2.2. The aim and methodology of this thesis

Relating to what 悟 (bodhi) is, I emphasised the importance of the second stage, the sceptic stage. This is because it related to the aim and methodology of this thesis.

2.2.1 The aim of the thesis.

I started this thesis aiming to present Zen's fundamental metaphysical view of the world in order to make sense of Zen's which appear to be illogical and puzzling. But because of the nature of 空 (śūnyatā), it is not possible to understand Zen's ultimate view without attaining 悟 (bodhi), the comprehension

beyond capability of analytical enquiry. This means that this thesis cannot express Zen's ultimate view. Instead the aim of the thesis is to transform us to the second stage towards 悟 (bodhi) by making us to "suspend any metaphysical beliefs" and "leave us positionless[20]". In other words, to makes us realise that, because any 名色 (nam-rūpa) according to which we construct experience and knowledge is 幻 (māyā) or 顛倒 (viparyāsa), we do not know anything about 寂滅 (nirvāna). As we learned in this chapter that being sceptical about our experience and knowledge is a positive thing. It is an essential step toward attainment of 悟 (bodhi). This is where Zen differs from nihilism. For nihilists, not committing to any perspective is the end, so that faced with the inability to commit, the nihilists "shrug one's shoulders in indecision"[21]. But for Zen, not committing to any perspective leads to the liberation from the tyranny of 名色 (nama-rūpa). The aim of this thesis is therefore described as preparing myself and the readers for the attainment of 悟 (bodhi) by making us realise that all we can experience and comprehend are 幻 (māyā) and 顛倒 (viparyāsa)

It is easy to make a statement that many metaphysical concepts are 空 (śūnya), but it is a completely different matter to actually prove each one of them to be 空 (śūnya). The rest of the thesis (except the Chapter Eight) are dedicated to prove how plausible it is to regard commonly held metaphysical concepts to be not only 空 (śūnya) but also to delude us and our experience and knowledge to be 幻 (māyā) and 顛倒 (viparyāsa).

2.2.2. 帰謬論法 (prasanga) methodology of this thesis

Because an unenlightened person like myself cannot make any positive comment about what 寂滅 (nirvāna) actually is, I will use a method called 帰謬論法 (prasamga) in order to deny existing metaphysical views. 帰謬論法 (prasamga) is a method of disproving rivalling ideas and doctrines by showing how their premises lead to undesirable and implausible conclusion. It was a

[20] Garfield Jay L. (1990), "Epoche and *Śūnyatā*: Skepticism East and West", in *Philosophy East and West*, vol.40, p.286 and p.290.
[21] Garfield, Joy L. (1990), ibid, p.290

method widely used by Āryadeva [22], Candrakīrti [23], Śāntideva [24] and Buddha-pālita[25]. This method did not make an obvious and direct impact on Ch'an/Zen. But the fact that works of Candrakīrki and Buddha-pālita strongly influenced Ch'an/Zen implies that it must have made a not obvious but subtle impact on Zen. I believe the use of 公案 (Jp; kouan) in Zen is the proof. 公案 (Jp; kouan) are riddle-like questions that are given to pupils in order to help them to attain 悟 (bodhi). A famous example of 公案 (kouan) is the "what is the sound of one hand?". It works in two different ways. One is a practical use, which is to prevent a pupil's mind to wonder off during meditation. If a pupil is preoccupied with a riddle, his mind is less likely to wonder off to think of so many other things especially things that could tempt him, such as cravings for sleep, comfort, food, sex, etc. The other use is to illustrate the 空 (śūnyatā) of 名色 (nama-rūpa) by making a pupil to realise that it is merely a tool that confuses us and prevent us from understanding the way the world really is.

帰謬論法 (prasanga) I will use in this thesis to examine the plausibility of existing metaphysical theories is based on three criteria; 1) compatibility with facts, 2) philosophical plausibility and 3) economy of theory. Obviously the theory must be compatible with observable facts. For example theory of numerical identity must explain and define what an individual is and how can something undergo change yet remain numerically identical. Theory of mind and body must explain what they are and why they seem to interact with each other. Philosophical plausibility means the rationality of a theory, what exactly the theory implies. A theory may concentrate too much on a particular aspect and neglect to examine the undesired implication. Philosophical plausibility also

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[22] Āryadeva (聖提婆) (2nd century CE), Indian Buddhist, a disciple of Nāgārjuna. Famous for his work; *Catuhşataka* 『四百論』.

[23] Candrakīrti (月称) (7th century CE), Among three Buddhists I named here, he is famous for the method of argument stated above. His works include *Prasannapadā* and *Madhyamakāvatāra* 『入中論』.

[24] Śāntideva (寂天) (685-763), Buddhist scholar who taught Mahāyāna doctrines at Nālandā University. Only two of his works survived; *Śīksā-samuccaya* 『学処集成』 and *Bodhi-cāryāvatāra* 『入菩提行論』.

[25] Buddhapālita (仏護) (470-540), A Tibetian Buddhist of Mādhyamika school. His works is considered to be important since it is believed that his understanding closely represent that of Nāgārjuna.

involves absence of self-contradiction. Any theory that contains self-contradiction cannot be true. Because the reality itself cannot be self-contradictory, the contradiction must exist in the way we understand reality. The third category, economy of theory, in this context means simplicity. The theory should have fewer fundamental claims and it should not have many additional claims in order to accommodate different circumstances. Some theories make *ad hoc* modifications or reinterpretations of a theory, or arbitrarily narrow their domain of applicability. According to Occam's razor, those theories tend not to represent a true picture of reality. Using this method, the rest of this thesis (except Chapter Eight) examine plausibility of 空 (śūnyatā) against various existing metaphysical theories that claims certain thing we experience or comprehend to accurately reflect the way the mind-independent reality actually is.

Part 2

The Denial of Intrinsic Divisions

In both Chapter One and Chapter Two, I explained that 名色 (nāma-rūpa) is 空 (śūnya), because the division between A and not-A, which defines 名色 (nāma-rūpas) is 有為 (samskrta) and such division is not 自性 (svabhāva). In other words, any division that defines 名色 (nāma-rūpas) is a product of human convention and not derived from the way the mind-independent reality is actually divided.

> For the boundaries of physical objects are not given by nature, not are the classes of events that count as "of the same type" that underline the generalizations that vouchsafe the attributions of explanatory significance involving words like "because." The canonizations of sortals and of object-boundaries drawn in space, time, and composition require social and linguistic conventions.[1]

The problem of 名色 (nama-rūpa), which the negative 空 (śūnyatā) illustrates, is that even though divisions are human inventions for the purpose of convenience, somehow we end up falsely believing that these divisions have objective legitimacy or that these divisions exist in the mind-independent reality. For example, we believe each human being is an ontologically or metaphysically distinct and separable entity, and we believe apples and oranges to be two distinct species. In order to defend 有為 (samskrta) and 無自性 (asvabhāva) of 名色 (nama-rūpa) I will examine legitimacy of Zen's belief against realism which believes the division actually exists in the mind-independent reality and it is something we discover.

Regarding identity condition, there are two issues, one is being identical and the other is being judged or regarded as identical. In other words the two issues are the issue of *identity* and the issue of *identity judgement*. Realists believe they are not two separate issues; they believe that we judge two things to be identical, because they are identical, as well as we judge two things to be distinct, because they are distinct. Zen on the other hand believes that there is no direct connection

[1] Garfield, Jay L. (1990), "Epoche and *Śūnyatā*: Skepticism East and West," in *Philosophy East and West*, vol.40, p.293.

between the two issues (i.e. the former does not necessarily determine the latter). Even if two things are identical, we may not recognise them to be identical, as well as we may falsely judge things to be identical, even though they are not. Zen thinks identity judgement is matter of human convenience and social convention, therefore identity judgement is arbitrary and not necessarily based upon facts.

There are two kinds of division between being the same and different; one is numerical division and the other is qualitative division. These two kinds of division have to be distinguished because a condition for qualitative identity and a condition for numerical identity are different. This is clear from the fact that being numerically identical and qualitatively identical do not necessarily coincide with each other. A numerically identical thing can be qualitatively different or perceived as being so, as well as two numerically distinct things can be qualitatively identical, so that they are referred to by the same word or concept. This thesis deals with the objective legitimacy of qualitative divisions and numerical divisions separately. As numerical identity is often defined in relation to qualitative identity, in order to analyse the objective legitimacy of numerical identity, this thesis tackles qualitative identity in the Chapter Three before analysing numerical identity in the Chapter Four.

3.

Qualitative division

As mental capacity of human is limited, in order to simplify what we experience and comprehend, we categorise things into different classes or types, such as natural kinds (human, water, ball), action (running, throwing), properties (blue, soft, agitating), events (party, seminar). A qualitative division defines qualitative identities of these classes and types by determining the boundary between what are "of the same type" and what are not. Zen thinks these classes and types are 名色 (nama-rūpa) thereby they are 空 (śūnya). In other words, these qualitative divisions that defines classes and types are products of human inventions and they are not the way in which 寂滅 (nirvāna) is actually divided.

As I explained in the Chapter Two, 空 (śūnya) can only be demonstrated by 帰謬論 (prasanga), I will argue against the realist who believes certain qualitative divisions are intrinsic and that they are something discovered.

3.1.Zen versus realism

A realist thinks that general terms and concepts reflect the way the world is, because reality determines where qualitative divisions lie. Zen opposes this realist belief. It thinks human values specify where a qualitative division lies and not reality. Garfield wrote;

> [the realist] argues that there are particular semantic facts which constitute or determine the meanings of words and which we grasp when we know word meaning...
> [Buddhist on the other hand thinks that] word meaning and the assertability of correctness regarding word use rest not upon such facts

but upon a network of social conventions regarding word use.[1]

Because realism assumes qualitative division to be intrinsic to the mind-independent reality, realism can be identified as supporting following two claims.

- Qualitative divisions exist in 寂滅 (nirvāna), so they are something we discover rather than something we invent.
- Disagreement and discrepancies in the judgement of where a qualitative division lies is a result of ignorance or misapprehension of 寂滅 (nirvāna)

Zen opposes this view. As Watts[2] describes, Zen thinks there are no ready-made boundaries (so-to-speak) in reality. But as we need to communicate with each other and organise our thoughts, we invent qualitative divisions to simplify the complex affair of reality. Qualitative divisions thereby reflect social and cultural agreements and not objective facts. Huntington writes;

a) "The *truth value* of a collection of words or concepts derives from its being used in a manner that may be seen as somehow consistent with the conceptual matrix of the socio-linguistic community in which it occurs."
b) "The *meaning* of a word or concept derives from its usage in some particular socio-linguistic community, and not from its reference to any real object".[3]

To further clarify the difference between Zen and realism, let me refer to Dupré's description of realism. Dupré describes realism as believing (scientific) concepts

[1] Garfielf Jay L. (1990), "Epoche and Śūnyatā; Skepticism East and West", in *Philosophy East and West*, vol. 40, p.290. A similar comparison is made by Hashizume, Daizaburo, (1985), 「仏教の言語戦略」("Linguistic tactics of Buddhism"), in 『現代思想』(*Modern Thouht*), p.272-291
[2] Watts Alan W. (1957), *The Way of Zen*, (N.Y.; Mentor Book), p.19-21
[3] Huntington, C. W. Jr. (1983), "A 'nonreferential' view of language and conceptual thought in the work of Tson-kha-pa", in *Philosophy East and West*, vol.33, p.326.

to "curves the nature by its joint[4]" (meaning a division we recognise matches with the divisions exists in mind-independent reality). Zen's position can be expressed as "we curve the nature in any way convenient for us". Our *choice* of qualitative division reflects human values, such as interest, convenience and social agreement. There may be infinite numbers of alternative ways to divide, classify or categorise the world. Among those infinite ways available to us, we choose a certain boundary, because it reflects our interest and convenience, and there is no rational or scientific reason to why a certain boundary should be chosen above all other possible divisions. This means that disagreement or discrepancy regarding a qualitative division arises because our choice of where the qualitative division lies is arbitrary.

3.2.Realist's theories and their problems

In order to address the implausibility of the realist belief, I choose to prove 空 (śūnyatā) of so-called natural kinds. Zen does not believe natural kinds to be special, it believes their qualitative division to be as 有為 (samskrta) as any other divisions. Whereas realists believe that even though some qualitative divisions may be products of human convention, at least qualitative divisions of natural kinds are unlikely to be human inventions, therefore they are something we discover in nature. The task of the realist is to establish a theory which proves that a qualitative division that defines a natural kind is intrinsic to the mind-independent reality. Of the many realist's theories of qualitative division, I will concentrate upon just two; one-over-many theory[5] and essentialism. My task is to critically examine the plausibility of these realist's theories in order to test the sustainability of the realists belief in qualitative divisions.

3.2.1. The one-over-many theory

This theory has been one of the most influential realist's theories of qualitative division. The idea of the one-over-many theory originated in Plato's idea of "Form" (eidos). For Plato, Form is a template which particulars exemplify

[4] Dupré, John. (1993), *The Disorder of Things*, (Cambridge, U.S.A; Harvard Univ. Press), p.70.
[5] The term is used by Aune in his Aune, Bruce. (1985), *Metaphysics – The Element* -, (Minneapolis, U.S.A.; Univ. of Minnesota Press).

or materialise in various degrees. There are many literatures written on Plato's form, so I will concentrate upon a more generalised one-over-many theory. The one-over-many theory explains qualitative sameness in terms of being one and the same *universal*, or having the same or similar relation to one and the same *universal*. Two numerically different objects x and y can be both denoted by "Q", when x and y exemplify or have a relation to one and the same universal Q. For example, two particular objects are recognised to be cows, if they instantiate the same univiersal, namely cow. An animal which we call a horse is not cow, because it does not manifest the same universal. Those who support the one-over-many theory believe that the world is made out of two kinds of basic elements or beings; *particulars* and *universals*. The difference between the two is normally explained as that the former is restricted by space and time, whereas the latter is not. What this means is that there can only be one particular which exists at any given moment, whereas the latter can be manifested in several places simultaneously. Providing space and time as criteria to distinguish particulars and universals is problematic. Lowe provides two examples where a particular can exist in two distinct locations. The first is an example of a dismantled watch[6]. The watch can exist in two locations if the casing is in a drawer and the mechanism is on a table, for example. He also recognises that if time travel is possible, the same person (John) from the future, present and the past can stand side by side. Then, according the spatio-temporal account, John must be a universal for he exists in three different locations. There are further developments[7] in distinguishing particulars and universals. For example, Lowe offered an solution to the dismantled watch example by providing a restrictions. He defined universal as something that is instantiated as well as instantiate another entity, whereas a particular instantiates another entity, but itself cannot be instantiated by something else.

The arguments for the modern one-over-many theory are *subject-predicate discourse* and the *abstract singular term*. The both arguments are based upon the assumption that, in order for a sentence such as "a is b" to have any truth value,

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[6] Lowe E.J. (2002), *A Survey of Metaphysics*, (Oxford; Oxford Univ. Press), p.349.
[7] Lowe E J (1998), *The Possibility of Metaphysics*, (Oxford; Clarendon), p.155 and also his (2002), *A Survey of Metaphysics*, (Oxford; Oxford University Press), p350.

both *a* and *b* must denote something. This assumption derives from a simple analysis of a sentence "a is b" where both *a* and *b* refer to particulars. For example a sentence "the morning star is the evening star" is true because "the morning star" and "the evening star" describes one and the same heavenly body Venus. Whereas a sentence "the moring start is mbaa" does not have truth value, since "mbaa" does not refer to anything. In the same way, in order for sentence such as "Socrates is courageous" and "this chair is blue" to have true values not only particulars (Socrates and this chair) but also universals (courageous and blue) must exist.

Universal can be not only a predicate but also be a subject of a subject-predicate sentence[8]. When a universal is the subject of a sentence, it is called an *abstract singular term*. Sentences which include abstract singular terms are "courage is an important virtue" and "blue is a soothing colour". These sentences consist entirely of universals (courage, virtue, blue and colour). These sentences have truth value even if there is no particular that actually exemplifies courage or blue. What a subject and a predicate denote are not particulars and they do not require the existence of particular. There are further debates regarding the general terms to denote universals (such as between Ramsey[9] and Quine[10]) which I would like to omit in this thesis, for they do not have significant influence upon the outcome.

The first problem of the one-over-many theory is that the truth value of both subject-predicate discourse and abstract singular term sentence can be explained without postulating universal. Predicate can be understood to denote a group of particulars rather than universal. For example, "Socrates is courageous" can be translated as "Socrates is one of the particulars denoted by the word courageous". In a similar way, a sentence that includes an unexemplified abstract singular term as a predicate can be translated to be an conditional sentence about particular or particulars. For example, "blue is a soothing colour" means ""if something is blue, it is one of the particulars that has a soothing effect". I do not believe it is an

[8] Loux, Michael J. (1978), *Substance and Attribute*, (Dordrecht; Reidel), chapter 4.
[9] Ramsey, F P. (1925), "Universals", in Mellor, D H. & Oliver, Alex. (eds.), (1997), *Properties*, (Oxford; Oxford Univ. Press.).
[10] Quine W.V. (1948), "On what there is", reprinted in Mellor, D H. & Oliver, Alex. (eds.), (1997), *Properties*, (Oxford; Oxford Univ. Press.)

effective way to prove or disprove ontological independence of the universal by analysing the truth value of a sentence. I think there is a fundamental problem in using the truth value of a sentence to indicate existence of what they denote. It is possible for a sentence to have truth value, even though a particular which the sentence denote does not exist. Imagine a sentence "Hera is a wife of Zeus". There is no concrete particular which "Hera" denotes, but the sentence is true and "Hera is a wife of Cronos" is false.

Other two main objections against the one-over-many theory concern what is known as problems of regress. One is the problem of infinite exemplification and the other is the problem of semantic regress which is also known as Bradley's regress. If every truth about an particular is explained in terms of exemplifying corresponding universals, then a particular must be exemplifying infinite number of universal. Consider a Yorkshire man. Being a Yorkshire man implies further natural kinds which he belongs to or exemplifies, such as Caucasian, British, Homo sapiens, mammal, vertebrate, animal, organic being, carbon-based entity, and so forth. This regress can go on forever, thereby kinds that an object belongs to or exemplifies can mounts up to infinite. This leads to the absurd implication of the one-over-many theory that even a simple object exemplifies or be composed of an infinite many universals.

The problem known as Bradley's regress derives from the fact that the one-over-many theory is not clear about the relation that is supposed to exist between the universal and the particular. If relation is explained in the form of universal, then, the relation between the particular and the universal require further universal. According to one-over-many theory, a sentence "this ball is red" is understood to be true if the particular "this ball" exemplifies the universal "red (or being red)". But if exemplification is considered as a relation, then further exemplification emerges, namely exemplify the relation of exemplification that exists between the ball and red. This leads to infinite regress regarding exemplification;

This ball is red
This ball exemplifies red.
This ball exemplifies "exemplification of red".
This ball exemplifies "exemplification of the exemplification of red".

I believe the one-over-many theory goes to unnecessary lengths to explain simple qualitative distinction. There are many alternative theories that are simpler and capable of explaining qualitative division without introducing the problematic concept of the universal as an ontologically independent entity. The theory explains how two or more objects can be identify to be the same kind, but it does not clarify how we can identify universals. In other words, it does not specify the criteria of qualitative identity judgement.

3.2.2. Essentialism

According to essentialism, the qualitative division is determined by the presence or the absence of a certain property, or a set of properties. An object is said to have the qualitative identity of Q, if it has a certain property or set of properties P which defines Q. Whereas if the object does not have the property P, then it is recognised to be *not-Q*. Therefore, numerically distinct objects x and y can be qualitatively identical if they both possess the same property or the same set of properties, but they do not have to share every property in common. They only have to share an *essential* property P which defines the qualitative identity of Q. Suppose a fish, a bird, a cat, and a human. They all belong to a kind; vertebrates, because they all have the essential property of having a backbone. In other words, the kind vertebrate is defined by the essential property of having a backbone. Other properties these creatures possess or exhibit are *accidental* with regards to being vertebrate, because they do not influence whether these creatures are vertebrate or not.

The first problem essentialism faces is the difficulty in identifying a primary essential property which defines the qualitative identity of a natural kind. Take the example of an elephant, we can write a long list of properties which the elephant possesses, such as "a long and nimble trunk", "thick grey skin", "big ears" and so forth. But none of these seem to be the essential primary property that defines being an elephant because some elephants that lack one of or all of these properties, due to mutilation or genetic mutation, can still be recognised as elephants.

The second problem derives from the progress of science. With scientific

development, the definition of the term changes and the boundary of the qualitative division shifts accordingly. To solve the problem, it is possible to argue that the past qualitative division was false or a mistake which arose from ignorance. But this leads to the pessimistic meta-induction from past falsity (see section 1.2.2.2.2.a). If all the qualitative divisions that past scientific theories proposed turned out to be false, the current qualitative divisions are most likely to be false again.

To combat these problems, a new theory was proposed by Kripke and Putnam which is commonly known as the Kripke-Putnam theory of natural kind term. In this thesis, I would like to concentrate on Putnam's theory. This theory claims that a qualitative division of natural kind is defined by *microstructural* (or theoretical) truth and not by a *stereotype*. What Putnam calls a stereotype consists of properties that we normally associate the natural kind with. For example, to use Putnam's favourite examples, a stereotype of water is a transparent liquid which does not have any specific taste, freezes at 0°c and boils at 100°c, it is not sticky or dense like syrup. Another example is gold which is yellow coloured shiny metallic material. He argues that what defines natural kinds such as water and gold is not the stereotypes, but microstructural truth; water is something composed of two hydrogen molecules and an oxygen molecule and gold is something whose nucleus consists of seventy nine positrons. To illustrate this point Putnam provides his famous Twin-Earth argument[11]. To summarise the idea, he imagined a planet similar to Earth in almost every way, but there is one difference; what the people of Twin-Earth call "water" has a different molecular structure called XYZ and not H_2O. The problem is that the stereotype of Twin-Earth-water (hereby twater) and the stereotype of Earth-water are identical, (i.e. twater looks and tastes like water, it freezes and boils like water, it has the same consistency as water, etc.). If the qualitative division of natural kind is defined by stereotype, we end up including twater into the type water. But twater should be distinguished from genuine water. The only way to distinguish between the two is to use the microstructural truth as the criterion for establishing a qualitative division of natural kind. Regardless of how twater fits with the

[11] Putnam, Hilary. (1975) "The meaning of 'meaning'", in Harnish, Robert M. (ed.) (1994), *Basic Topics in the Philosophy of Language*, (Hertfordshire; Harvester Wheatsheaf), p.228-234.

stereotype of water, since it does not consist of two hydrogen atoms and an oxygen atom, it cannot be included in the natural kind of water. What the Twin-Earth argument shows is that even if an object fails to match the appearance or properties of the stereotype, as long as it possesses microstructural (or theoretical) truth that defines the natural kind Q, the object can be identified as Q.

The obvious question that arises from Putnam's theory of natural kind terms is how did we recognise water before the molecular structures of water or gold were discovered. Putnam believes that the qualitative division of natural kind is determined by the way the world is, but not by the way we perceive it. So that if water is H_2O, then water has always been H_2O regardless of whether or not we are aware of its microstructural truth. It is a mistake to identify twater as water even if we are ignorant of the microstructural truth of water. In the same manner, he explains all disagreement and discrepancy regarding qualitative division in terms of "the division of linguistic labour[12]." It is a division between experts and laypersons; those who know microstructural truth and those who are ignorant of it. According to the division of linguistic labour, because microstructural truth defines natural kinds, disagreement does not occur among experts. The only chance for disagreement to occur is where a layperson is present, because he is ignorant of the microstructural truth of water. And such disagreement can be solved by an expert educating the layperson about the microstructural truth.

There are many problems with Putnam's theory of natural kind. Firstly there is a doubt as to the expert's ability to recognise the microstructural truth. Putnam's argument assumes that that experts have the ability to comprehend reality as it as. However, as we saw in Chapter One, even scientists suffer from 幻 (māyā) and 顛倒 (viparyāsa) because their understanding are influenced by 名色 (nama-rūpa) of auxiliary hypothesis (section 1.2.2.2.1), paradigm and contextual value (section 1.2.2.2.2.b). These arguments demonstrated that the definitions of scientific terms and outcomes of scientific judgements are influenced by those values, and even experts are not capable of escaping from them. This proves the point that qualitative divisions in science are not defined purely by objective fact as Putnam wishes.

[12] Putnam Hilary (1975), ibid. p.232.

The second problem is that of applicability. Certain natural kinds such as water and gold can be defined in terms of microstructural truth, but there is a serious doubt to the existence of fundamental microstructural truths regarding natural kinds outside of pure chemistry and physics. Dupré argues that Putnam's theory cannot explain qualitative divisions of natural kinds in biology and taxonomy. Taxonomy seems to indicate that scientific qualitative divisions are influenced by the qualitative divisions of everyday life rather than the way Putnam suggests. For example, scientifically, birds should not be a class called Aves, but an order that belongs to Reptilia alongside Chelonia (tortoises and turtles, Crocodilia (alligators and crocodiles) and Squamata (snakes, lizards, etc.) This is because the microstructural truth that defines Reptilia is also applicable to all birds. The only reason Aves is considered as a class and not an order is that the ordinary language laypersons use has influenced science and not the other way round as Putnam assumes.

Dupré[13] argues further that essentialism fails to explain not only the qualitative division in taxonomy but also the most fundamental qualitative division between natural kinds of male and female. There is no genetic essence or sex specific behaviour common to everything that is recognised to male. There is no anatomical sameness. For example the male Ginko tree has no anatomical similarity to male mammals. The qualitative division between male and female is not determined by microstructural truth but rather by stereotypes or the general similarities that exists among members of male or female. Interestingly there is a passage 維摩経[14] (Vimalakīrti-niradeśa-sūtra) which deals with 空 (śūnyatā) of the qualitative division between male and female. When Śāriputta[15] (舎利子) met *devakanyā* (天女; a celestial maiden), he asked why she took the female form and not the male form. To answer his question using her superhuman power she changed Śāriputta into a female and replied "the enlightened one understand that everything is neither male nor female", because such division is 空 (śūnya).

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[13] Dupré, John. (1993), *The Disorder of Things*, (Cambridcge, M.A., U.S.A; Harverd Univ. Press), p.68-84

[14] 『維摩経』(Vimalakīrti-niradeśa-sūtra), VI.

[15] Śāriputta (舎利子) is athe cheif diciple of Gautama Buddha. In many Buddhism texts were written in a form of Gautama Buddha talking to Śāriputta.

There is also what Brown calls "the composition problem[16]." The problem arises from the fact that natural kinds normally exist in impure forms. For example "the stuff in rivers and lakes etc. typically contains not only H_2O, but also D_2O, H_2O_2, salt and other minerals etc."[17] Including the impure liquid as water is not a problem for Putnam's theory, as long as the liquid contains H_2O. The problem is that this allows blood, coffee and tea to be water as well. I believe this also illustrates another problem in that the qualitative division is not as clear or definite as Putnam wishes. Even if I add a pinch of salt, a half glass of water remains to be water. If I keep adding a pinch of salt, then at some point there is more salt than water in the glass, and it becomes saturated salt rather than salt water. But at which point does the content of the glass cease to be water? If we do not regard the glass of dampened salt as water, then there must be some definable point at which the content of the glass turns from water to salt. Moreover, according to Putnam because a qualitative division is something to be discovered, this point must be agreeable to all experts. Some may argue that the boundary is whether salt or water composes more than 50% of the content of the glass. But a question is how to define 50%. Chemistry uses different way of measuring percentage. Percentage can be based on weight, mass or mole (atomic weight). One solution to the problem may be as Abbot[18] concluded, to allow only the pure form of water to be known as water. This, however, makes the kind "water" useless, because it cannot be applied to many liquids referred to water in common language.

A problem of Putnam's theory which is relevant to 空 (śūnyatā) is his idea that disagreement and discrepancy regarding a qualitative division of a natural kind can be solved by experts. Let me express the problem using an example of cross-breeding between a tiger and a lion.

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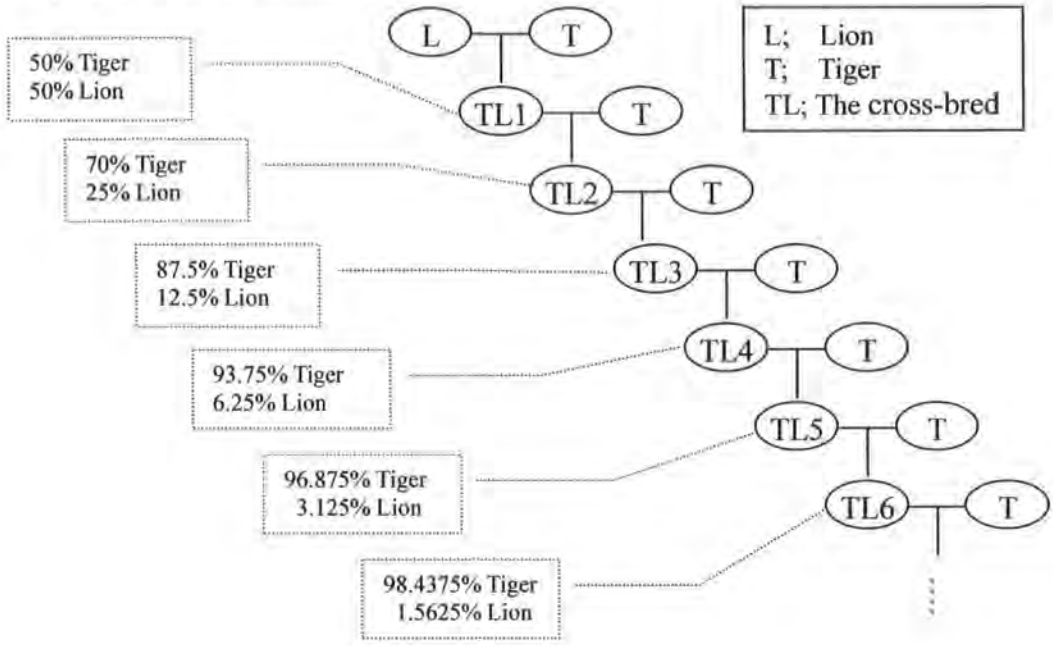
[16] Brown, Jessica. (1998), "Natural kind terms and recognitional capacities", in *Mind*, vol.107, p.280.
[17] Brown, Jessica. (1998), ibid. p.281
[18] Abbot, Barbara. (1997), "A note on the nature of water", in *Mind*, vol.106, p.313-319.

[Fig.2.1.] Cross-breeding.



Regarding the qualitative identity of cross-breeding between lion and tiger, contrary to what Putnam claim, disagreement can arise even among experts. A disagreement can derive from difference in the choice of criteria. Qualitative identity judgement can be determined by different criteria such as appearance, behaviour, genetic structure (DNA), ancestry, and so forth. Depending on which criteria a taxonomist uses, the outcome of qualitative identity judgement differs. For example, if the taxonomist chooses ancestry as the criterion of qualitative identity, then the cross-breed is neither tiger nor lion, but a new species called "liger" or "tigon". Whereas if appearance or genetic make-up is chosen, TL6 may be recognised to be a tiger (since TL6 is more than 98% tiger). This is the first kind of disagreement, the disagreement concerning criteria of qualitative identity judgement.

Even if taxonomists could agree upon the criteria according to which a natural kind is determined, experts may disagree on where the qualitative division lies. Genetically TL6 is 98.4375% tiger which appears to be within the allowance of genetic diversity prevalent in the entire population of tiger. Supposing we compare TL6 with a tiger which suffers a genetic mutation. It is possible that even though its parents are both 100% tiger, the mutant has a lower number of genetic

properties of a tiger than TL6. In this case, essentialism has to choose one of the following two options. If we recognise the mutant as a tiger then we must recognise TL6 as a tiger, too. If we regard TL6 as a new species and not a tiger, then we cannot classify the mutant as a tiger. These essentialist interpretations, however, contradict with normal taxonomic practice. In taxonomy, the mutant is still regarded as tiger (a mutant tiger), whereas TL6 would be regarded as a separate species from a tiger, a cross-breed of the lion and the tiger. Moreover, the case of cross-breeding illustrates the fact that our qualitative divisions are often blurred and ambiguous. There is a discrepancy as to where people draw the boundary of qualitative division between the mutant tiger and the cross-breed. For example, some may refuse to classify any off-spring of cross-breeding as a tiger at all, even though it may be 99.999....% tiger. Some may classify any off-spring with 90% or more of a tiger's properties to be a tiger (i.e. from the fourth generation onwards), whereas others would claim only the sixth generation onwards (in excess of 98% tiger) can accurately be regarded as a tiger. Putnam would argue there is no disagreement among experts with sufficient knowledge regarding the qualitative identity of TL6. This implies that there must be one definite percentage which all capable experts would agree upon. Such an idea seems to be implausible. We cannot dismiss the discrepancy in qualitative identity judgement as simply a result of ignorance. The discrepancy is rather the result of a difference in individual opinion, preference, and convenience. This indicates that the qualitative division is 有為 (samskrta) and not 自性 (svabhāva; intrinsic) to 寂滅 (nirvāna).

Since realists believe that there must be a definite qualitative division between being a tiger and not being a tiger, some decisions must be more objectively legitimate or more accurately correspond with the way in which the world is structured, and the disagreement and discrepancy would be resolved by the progress of our knowledge. Contrary to what the realist believes, it is difficult to dismiss these disagreements among taxonomists simply as results of ignorance or miscomprehension of reality. The above arguments indicate that the choice of criteria and where the boundary lies appears to be a matter of opinion rather than particular essence or microstructural truth.

I may be accused of being unfair towards Putnam. Putnam uses the term natural kinds to denote a much narrower spectrum of things than I do. According to Putnam, natural kind term is a *rigid non-descriptional term*. This means that my argument against realism may not be applicable to Putnam's theory, but I have doubts as to the benefit of such a narrow field of definition. For example, Deutch [19] states that Kripke-Putnam's theory may be philosophically well-founded but it is rarely mentioned in linguistics, as the theory cannot explain the ordinary use of language.

3.3. 空 (śūnyatā) of qualitative divisions

3.3.1.Qualitative divisions and human values

As we have seen above, it is not plausible to defend the realist's idea of natural kinds that their qualitative divisions are intrinsic to the mind-independent reality and they are something we discover. Contrary to what realists suppose, discrepancy, disagreement and diversity regarding where qualitative division is drawn cannot be dismissed simply as results of ignorance. Like the example of the cross-breeding between lion and tiger illustrated, disagreement is a result of personal choice and preference and not result of ignorance, because there is no definite and universal answer to where the qualitative division between tiger and not-tiger lies. This conforms with Zen's concept of 空 (śūnyatā). According to the concept, every qualitative division which 名色 (nama-rūpa) suggests is a product of human invention (有為; samskrta), so that it is determined by human values such as preference, convenience and social consensus and not by the way mind-independent reality (寂滅; nirvāna) actually is. In other words, even though we may divide, categorise and label what we comprehend in terms of the qualitative division between A or not-A, there is not such division exist in the mind-independent reality. This is because every qualitative division is something we project upon what we experience and comprehend. As quotations from Garfield and Huntington indicated, meaning, assertability and truth value of concepts or words which Buddhism calls 名色 (nama-rūpa) derives from human

[19] Deutsch, Harry. (1993), "Semantic for natural kind terms", in *Canadian Journal of Philosophy*, vol.23, p.389-412.

value and not from the way the mind-independent reality actually is.

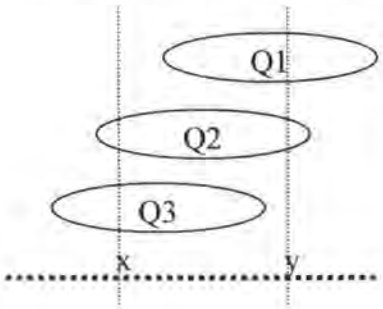
The way qualitative divisions derives from human values can be explained as follow. At a micro level, an individual divides, classifies and labels the world in the way he or she finds useful. For example people organise their bookshelves in the alphabetical order of authors' names or of titles, size or category according to personal convenience. At a macro level, a certain invented qualitative division is accepted by society because other members of the society find it useful or they themselves have made a similar qualitative division. People try to agree on the definition or scope of a certain concept or how the world should be divided, because it is useful for people to communicate and understand each other. If people cannot agree on a definition or meaning of a word or a concept, the conversation is comparable to two people speaking in different languages. Once the qualitative division is accepted by the society, members of the society learn to classify the world accordingly, as Watts' stated;

> Just as people speaking the same language have tacit agreements as to what words shall stand for what things, so the members of every society and every culture are united by bonds of communication resting upon all kinds of agreement as to the classification and valuation of actions and things.
> Thus the task of education is to make children fit to live in a society by persuading them to learn and accept its codes – the rules and conventions of communication whereby the society holds itself together. There is first the spoken language. The child is taught to accept "tree" and not "boojum" as the agreed sign for that (pointing to the object). We have no difficulty in understanding that the word "tree" is a matter of convention. What is much less obvious is that convention also governs the delineation of the thing to which the word is assigned. For the child has to be taught not only what words are to stand for what things, but also the way in which his culture has tacitly agreed to divide things from each other, to mark out the boundaries

within our daily experience.[20]

Where we choose to draw qualitative division influences qualitative identity judgement. Supposing there are three different definitions of a concept *Q*. To say *x* and *y* are qualitatively identical, we have to specify in what sense or in terms of which 名色 (nama-rūpa).

[Fig.2.2] Qualitative identity judgement



In this example, qualitative identity of x and y are different according to which definition of the Q is used.
Q1; x is not Q but y is Q, therefore x and y are qualitatively different.
Q2; x is Q, and y is also Q, therefore x and y are qualitatively identical.
Q3; x is Q but y is not, therefore x and y are qualitatively distinct.

Qualitative division plays a necessary part in our comprehension of reality, because seeing something in the bi-value manner of Q or not-Q is the way in which we simplify the complex affair of reality. The problem is that, as we learned in the Chapter One, the bi-value perspective (A or not-A) of the world causes the *tyranny of 名色 (nama-rūpa)*. We see something in the wrong way (顚倒; viparyāsa) or see an illusion (幻; māyā) because we falsely believe qualitative divisions we use are determined by the way the mind-independent reality is actually divided. As I explained in Chapter Two, understanding of 名色 (nama-rūpa) to be 空 (śūnya) is important because it is the only way to be liberated from 幻 (māyā) and 顚倒 (viparyāsa), and consequently from 苦 (duhkha). I have therefore spent a substantial part of this chapter in the critical analysis of realist theories.

3.3.2. Why we falsely believe qualitative division?

Let us now move onto a question of why we falsely believe the existence of

[20] Watts, Alan (1957), *The Way of Zen*, (N.Y.; Mentor Books), p.18-19.

qualitative divisions which 名色 (nama-rūpas) implies, and if not reality then what determines our choice of a certain qualitative division over others.

The commonly held belief in intrinsic nature, 自性 (svabhāva), of qualitative division between natural kinds is strongly related to religious belief. Religions, especially ones that have faith in a creationist view, assume that qualitative divisions between different natural kinds are objective fact because they are God given. These religions think a human being is created as a human being, and a cow is created as a cow, a bird as a bird. For example in Genesis;

> God commanded, "Let the earth put forth vegetation, plants, yielding seed, and trees bearing fruit in which is their seed, each according to its kind."- and it was done…
> God commanded, "Let the water bring forth swarms of living creatures, and let birds fly across the heavens." So God created the great sea monsters and every living creature with which the waters swarm, and every winged bird…
> God commanded, "Let the earth bring forth living creatures: cattle and creeping things and beasts of the earth." So God made the beasts of the earth, and the cattle, and everything that creeps upon the ground according to its kind…
> Then God said, "Let us make man in our image, after our likeness; and let them have domination over all the earth." So God created man in his own image, in the image of God he created him; make and female he created them. And God blessed them, saying, "be fruitful and multiply, and fill the earth and subdue it;…

This explains why people with the creationist's religious faith believe in objective qualitative division, but it does not fully clarify why many of us who do not hold a strong religious view still falsely assume objective legitimacy in qualitative divisions. Even though religious beliefs are no longer upheld by the majority, the way in which religions have divided the world is passed down to us, and we do not change this, because changing something which people have already agreed

upon would make communication difficult. Even though there may be an infinite number of alternative ways to divide and classify things, we stick with the widely accepted division as it is the most convenient one. We choose a certain way of dividing and classifying things not because it is objectively more legitimate, but because it conforms with the way in which society has previously divided and classified things. This phenomena is called *social conformity* and it is widely studied in social psychology. Various experiments carried out by Sherif[21], Asch[22], Larsen[23] and Crutchfield[24] indicated that the choices an individual make follow what a majority has chosen. In Asch's experiments, subjects were given the simple task of identifying which of three lines on a card matched the standard line. Subjects were put into groups where others were impostors who were instructed to give wrong answer. In such environment, the subjects agreed with the group decision. This indicates that humans are social animals who are reluctant to invent or use a qualitative division which contradicts the opinion and tradition of the majority. This is why we are stuck qualitative divisions derived from religions and falsely believe them to be intrinsic to the mind-independent reality.

3.4. Conclusion

In this chapter, in order to demonstrate 空 (śūnyatā) of 名色 (nama-rūpa), I have looked into plausibility for qualitative division which defines the natural kind to be 有為 (samskrta). I did so by setting up arguments against the opposing view held by the realist that qualitative divisions of natural kinds are intrinsic to the mind-independent reality and it is something we discover rather than invent. I came to the conclusion that the realist's theory of a qualitative division is not plausible because disagreement regarding the qualitative division cannot be dismissed as a result of ignorance as the realist suggests.

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[21] Sherif, M. (1966), *Group Conflict and Co-operation*, (London; RKP). He devised an experiment which asked a subject to make assessment of how far a red light moved in the dark. The subject's decision was influenced to favour the group decision.

[22] Asch, S.E. (1956), "Studies of independent and submission to group pressuer, 1", in *Psychological Monographs*, vol. 70.

[23] Larsen, K.S. (1974), "Conformity in the Asch experiment", in *Journal of Social Psychology*, vol.35.

[24] Crutchfield, R.S. (1954), "A new technique for measuring individual differences to group judgement", in *Proceedings of the Invitational Conference on Testing Problem*, p.69-74.

If the qualitative divisions that define natural kinds are 空 (śūnya), then other 名色 s (nama-rūpas) according to which we divide things into different types would also be 空 (śūnya). To list few examples, the differences between running and walking, black and white, hard and soft, and so forth. It is important for us to realise that all 名色 s (nama-rūpas) that are defined by qualitative divisions are 空 (śūnya) and our judgement of being different or being the same type is 有為 (samskrta). I believe I have covered sufficient ground to refute a realist's perspective of qualitative divisions, concepts and general terms. But to truly understand the 空 (emptiness) of 名色 (concepts) we must proceed to the next chapter which explains the root of 空 (emptiness), which causes us to misapprehend reality.

4.

Numerical divisions

The previous chapter examined the qualitative divisions that define 名色s (nama-rūpas) that are used to categorise and label things into different types. There is an another kind of division which defines 名色 (nama-rūpa) which can be called *numerical division*. In order to make sense of our experience and knowledge we divide the world not only into different types, but also into countable individual objects. While qualitative divisions define 名色 (nama-rūpas) that used to categorise and label things into different types, *numerical divisions* define 名色 (nama-rūpas) that are used to divide the world into countable objects. For example, we perceive the world to be composed of individual persons, various creatures and organic beings such as amoebas, dogs, trees, natural inanimate objects such as mountains, islands, rocks and man-made objects such as tables, chairs, cars and so forth. In this example, "person", "dog", "chair" and so forth are 名色 (nama-rūpas) that are defined by numerical divisions. Zen thinks that not only qualitative divisions but also numerical divisions are 有為 (samskrta) and 無自性 (asvabhāva). In other words, Zen believes that the 名色s (nama-rūpas) defined by numerical divisions are also 空 (śūnya). In order to defend this Zen's position, I will employ the same method which I used in the previous chapter. It is 帰謬論法 (prasanga), against realist's view on numerical division that is held by the unenlightened. As quotations from Garfield[1] and Huntington[2] indicated, realists believe that where numerical divisions lie are determined by the way the mind-independent reality (寂滅;

[1] See the Introduction to Part Two and Chapter Three (section2.1.)
[2] See section 2.1. in Chapter Two

nirvāna) is actually divided. In other words, they believe the mind-independent reality is actually divided in the way 名色 s (nama-rūpas) suggest. As previously examined this is the realist's belief that qualitative divisions are intrinsic to the mind-independent reality. The realist's belief also implies that there must be a definitive answer to questions of numerical identity, so that any disagreement and discrepancy regarding numerical division must be a result of ignorance. If Zen is right about numerical division, then this realists belief is not sustainable.

4.1. Numerical divisions and 無我 (anātman)

To understand numerical divisions to be 有為 (samskrta; products of human invention) is particularly important for Buddhism, since it leads to idea of 無我 (anātman) which is often translated as "Non-Self". Although no such distinction exists in Zen, I believe it is useful to break down the idea into two components; the denial of subjective/objective distinction and the denial of ordinary countable objects as genuine individual entities. In order to distinguish the two components, I will use "non-self" for the former and the "Non-Self" for the latter. The difference between "self" and "Self" is that "self" signifies what we perceived as "I", a human individual in first person sense, whereas "Self" encompasses everything which we believe to be an individual being, including animated objects, organic object, artefacts and so forth. In other words, "self" is a narrowed and specific case of "Self".

The first and the most fundamental division we make is the subjective-objective division, the division between 'self' and the world around us. We assume that:

> Physical things, other living beings are "out there" – objective reality; we – our true selves – are forever separated and different from the "things" and "person" that we think about, feel toward, analyze, describe by word and distinction...[3]

[3] King, Winston L. (1964), *In the Hope of Nibbāna – an Essay on Theravāda Buddhism Ethics*, (La Salle, U.S.A.: Open Court).

We commonly believe ourselves to be genuine individual beings that are metaphysically or ontologically independent and separable from each other and from the environment. To put it an another way, we normally believe there is a definite division between the individual 'self' that is a subject of experience and thought, and the world, an object of experience and thought. Once a person believes he is a genuine individual, then that belief is extended to other things which we perceive as a individual beings. If I am a genuine individual entity, then other human beings which appear to be similar to myself must also be genuine individual entities. This belief in self and Selves to be genuine individuals is the realist view held by the unenlightened.

self; self (I) appear to be distinguishable from others and from the environment, therefore self (I) must be a genuine individual

Self; we perceive Self (any individual being) to be distinguishable from others and from the environment, therefore Self (any individual being) must be genuine individuals.

Zen objects to this realist's view. Zen does not believe in the numerical division between subjects and objects, as well as numerical divisions between 'Selves' (ordinary objects). Zen considers the idea of separable and distinguishable 'Selves' to be 空 (śūnya), in the sense that separable and distinguishable 'Selves' are 有為 (samskrta) and do not exist in 寂滅 (nirvāna). Contrasting to the above characterisation of the common belief, Zen's position concerning numerical division can be described as:

non-self; self (I) appear to be distinguishable from others and from the environment, but self (I) is not a genuine individual.

Non-Self; We perceive Self (individual being) to be distinguishable from others and from the environment, but it is not a genuine individuals.

These two meanings have to be recognised, because the idea of 無我 (anātman) is often misunderstood to deal only with "self" as an individual human being. The

無我 (anātman) is not just a human individual in the first person sense, but every countable object we consider to be a genuine individual. 無我 (anātman) is strongly related to the topic of numerical division because the idea can be understood as the denial of the false belief the unenlightened hold regarding numerical divisions. I will come back to examine the idea of 無我 (anātman) after I have demonstrated numerical divisions to be 有為 (samskrta) and how they do not reflect the mind-independent reality.

Traditionally, 無我 (anātman) has been explained using 空 (śūnyatā) of 五蘊 (five skandhas). To state briefly the argument takes the form of 我 (ātman; self) is composed of 五蘊 (five skandha) and the 五蘊 (five skandha) are 空 (śūnya), therefore 我 (ātman) is 空 (śūnya). But this approach is not easily comprehensible to western philosohers who has no knowledge of Buddhism, therefore I will use a different method to prove 空 (śūnyatā) of 我 (ātman).

Please note that this chapter only deals with composite individual and not the microscopic individual. Composite individuals include humans, animals, houses, rocks, rivers, mountains and others which are divisible because they are made out of smaller units or parts. Whereas microscopic objects are so-called simples or mereological atoms that have no parts, they are the simplest existing units.

4.2. Two Problems of numerical identity

Recognising the problems or difficulties of making a numerical identity judgement is important. These problems are the minimum requirement for any numerical identity theory to solve, and if the realist's theories fail to do so, these problems and difficulties become proof that numerical divisions are 有為 (samskrta) and 無自性 (asvabhāva). If numerical divisions are intrinsic to 寂滅 (nirvāna) as realists claim, then there should be a definite answer to every numerical identity judgement. But if numerical identity is 空 (śūnya), then disagreement and inconsistency regarding numerical identity judgement is inevitable. This section of the chapter looks into various difficulties and inconsistencies that cannot be dismissed simply as the result of ignorance. Problems and difficulties can be divided into two kinds, the problem of natural

unity and the problem of change. The problem of natural unity deals with the difficulty of defining differences between what is an single individual, what is a constituent of an individual and what is a composite of individuals. The problem of change deals with the division between changes that alter the numerical identity and changes that do not. In both kinds of problem, the difficulty lies in finding universally applicable criteria of numerical identity of what makes x to be a single individual, and what makes x and y to be numerically identical. Together with stating problems and difficulties, I will also examine the possible criteria of numerical identity and argue why they cannot be used to define numerical identity. After listing various difficulties regarding numerical identity, I will examine theories of numerical identity which aim to overcome these problems and difficulties. In order to demonstrate numerical divisions to be 空 (śūnya), I will show that these theories fail to provide definitive answers to these problems.

4.2.1.Problem of natural unity

As I stated earlier, ordinary objects are physically divisible to smaller parts or constituents. We somehow regard a collection of things to be a single individual rather than a collection of individuals. In order to defend the idea that a composite entity is a genuine individual, there must be something that metaphysically or ontologically unites these constituents. This is a topic which van Inwagen[4] called the *composition question*; what unites constituents (*x*s) to make up a single entity (*y*). Philosophers have tried to find criteria of "natural unity"; what unites constituents, but there has not been much success. This chapter aims to argue that there is no natural unity, that it is simply 有為 (samskrta) a product of human convention.

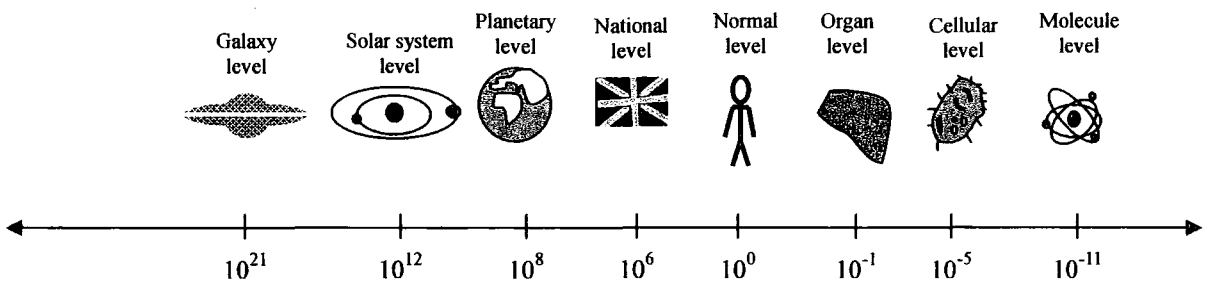
Because a human being has mass and the body is three-dimensionally extended it is physically divisible into smaller parts. For example a body is made out of cells, fibres and bones, and in turn they are made out of atoms and those atoms are made out of electrons, neutron, positron, those subatomic particles are made out of quantum particles. We somehow regard a mass of those constituents to be a single human being. The same thing can be said about everything that has

[4] van Inwagen, Peter. (2002), *Metaphysics -2nd ed -*, (Colorado U.S.A.; Westview Press)

mass. A plant is made out of stems, leaves, a flower or a fruit, roots, etc. A car consists of cylinders, a fuel tank, a radiator, windscreen, doors and so forth. We somehow consider a collection of matter be a single being, regardless of whether the object in question is natural, organic or artificial.

An ordinary individual being is not only a composite but also a constituent of a bigger composite. Individual human beings make up a nation, such as Great Britain. The sun, the earth, Mars, Jupiter, and other satellites and moons compose the solar system. Many solar systems make up a galaxy. The universe is made out of galaxies and nebulas and so forth. If I position a human being as a composite and as a constituent, then I will come up with the following diagram.

[Fig 4.1.] Infinite levels to divide the universe



This indicates that the galaxy is a part of the universe, the solar system is a part of the galaxy, the earth is a part of solar system, each individual human being is a part of the earth and a nation, a cell is a part of the human being, atoms are parts of cells, and subatomic particles are parts of atoms. As it can be seen in the above diagram, the world can be divided at different levels, and recognising a human being as an individual being is only one of these infinite ways to divide the universe. In order to defend the idea that a human being or ordinary objects are genuine individuals, the realist has to argue that a dividing at a particular level is ontologically and metaphysically more significant than others. Zen argues that such a way of dividing the universe is not significant at all, and the choice of the division is made according to human values of preference, convenience and social consensus. To illustrate this point, let me make a comparison between a human body and a colony of ants. A human body is made out of different parts, such as a

brain (right and left hemispheres, cerebellum, brain stem), organs (kidneys, liver, intestines), heart, lungs, muscles, bones, bone marrow, blood cells, etc. Each part contributes to the sustenance of the body as a whole, and each part can survives because it belongs to the body as a whole (a kidney or a heart cannot survive on a vat by themselves). This relationship that exists between a whole body and its parts is similar to the relationship between individual ants and the colony as a whole. Even though the ability and intelligence of each individual ant is limited, the ant's colony displays a remarkable level of purpose and intelligence. For example, the construction of the colonial home involves a vast and sophisticated engineering planning. But clearly no individual ant carries a mental conception of the overall design. Moreover, it is clear from the fact that a single ant cannot survive by itself, that ants are interdependent on each other. The colony is sustained by individual ants as well as each ant being sustained by the colony it belongs to. If we consider a human being as a genuine individual rather than an aggregate of individuals, then why should we not regard a colony of ants as an individual and not an aggregate of individuals? If, on the other hand, we consider a colony of ants as an aggregate of individuals (individual ants), then why should we not regard a human being as an aggregate of body parts or cells which are individuals in their own rights? Realism has to prove that there is something that unites human body parts which does not exist amongst a colony of ants.

The problem of natural unity is not limited to the three-dimensionally extended object, the same problem can be applied to the mind. Many neuro-psychological studies have indicated that mind is also divisible, therefore a composite. These neuro-psychological studies are carried out on split brain patients (those whose corpus callosums are destroyed by accidents or surgically removed as a treatment for severe epilepsy). As the left and the right hemispheres of a brain cannot communicate with each other, in some cases, patients behave as if two separate minds occupy one body. Preilowski[5] reported that one person buttoned his shirt with one hand while the other hand unbuttoned it. Dimond asked split brain patients how they felt. One patient described the simple daily

[5] Preilowski, B. (1975) "Bilateral motor interaction: Perceptual-motor performance of partial and complete split-brain patients", in Zülch, K.J., Greutzfeld, O. & Galbraith, G.C. (eds.) (1975), *Cerebral Localization*, (N.Y.; Springer-Verlag), p.115-132.

task of turning the pages of a book as follows:

> "If I'm reading I can hold the book in my right hand; it's a lot easier to sit on my left hand, than to hold it with both hands.... You tell your hand – I'm going to turn so many pages in a book – turn three pages – then somehow the left hand will pick up two pages and your're page 5, or whatever. It's better to let it go, pick it up with the right hand, and then to the right page. With your right hand you correct what the left has done."[6]

These studies indicate that not only the physical body, but also the mind, is not a single entity but a composite. Realism must, therefore, provide proof that there is something which unites the divisible mind to make it a single entity.

So far, we have considered the possibility of regarding a human being as a composite of individual constituents. Now let us consider the other possibility that an individual human being can also be an indistinguishable constituent of a composite individual. Like a colony of ants, human society is made out of individual human beings who do not necessarily carry the grand plan of the society. Moreover, most of us are not self-sufficient but our lives depend on the society. This seems to suggest that there is no significant difference between a colony of ants and a human society. Suppose that there is an extra-terrestrial intelligence observing the earth. The extra-terrestrial intelligence may perceive the human society to be no more sophisticated than a colony of ants or an aggregate of organs and cells. We can therefore imagine that to the extra-terrestrial intelligence, a human society may appear to be a single entity with interdependent parts rather than a collection of genuine individual entities.

The same thing can be said about our minds. There are no boundaries between minds. In a society, people share and influence each others' ideas and feelings. In a discussion group, the final decisions of each individual are the result of interactions between their minds. As we have seen earlier, an individual mind is a composite where different parts of the mind collectively make a decision.

[6] Dimond, S.J. (1979) "Symmetry and asymmetry in the vertebrate brain" in Oakley, D.A., & Plotkin,H.C. (eds.) *Brain, Behaviour and Evolution*, (London; Methuen), p.189-218.

Therefore, there seems to be no fundamental difference between the way a committee makes decisions and the way an individual makes decisions. Supposing we put a group of people in one room, and one person in the other room, and ask them both to come up with a solution to a complicated political or managerial problem. From the solutions offered we would not be able to tell which room contains the single person or the group. This proves the point that we are not capable of telling whether the mind is a single concrete particular or a collection of concrete particulars. This is damaging to realism since what appears to be a concrete particular may not be a genuine concrete particular at all.

In order for realists to defend the idea that human individuals are genuine individuals, they have to come up with a plausible argument for this particular of dividing the world to be metaphysically and ontologically significant than other alternative ways. In other words, any theory which supports the realist's view must prove the significant difference between the individual human, a colony of ants and human society. The failure to provide such evidence would indicate that world is not actually divided in the way 名色 (nama-rūpa) suggest.

4.2.2. Problem of change and identity

One of the philosophical questions that has persistently troubled many thinkers is the problem of change and numerical identity. What puzzles philosophers is the fact that something can be different as a result of change, yet, remains to be numerically one and the same thing. If no change takes place, the numerical identity of an object can be judged easily using Leibniz's law[7]. Unfortunately, reality is not that simple. Everything experiences change, and change by definition means that what exists after the change is different from what it was before the change occurred. The problem is that some changes alter the numerical identity and other changes do not. On some occasions we recognise objects before and after the change to be numerically distinct, yet on other occasions we recognise what was before and after the change to be numerically identical. If realists are correct, there is definite and intrinsic difference between

[7] For x and y to be numerically identical, everything that is true to x must be true to y. The idea was expressed in Leibniz's letter to Clarke. A quote can be found in H.W.B.Joseph (1949), *Letters on the Philosophy of Leibniz,* (Oxford; Clarendon), p.17.

these two kinds of change so that every question regarding numerical identity judgement has a definite answer. If a question turns out to be insolvable or there is no consistency in what degree and sort of change and degree causes numerical identity to alter, then numerical identity must be 有為 (samskrta) and not intrinsic as realists believe.

4.2.2.1. The problem of constituent change.

It is true that the identity of certain physical objects can be determined by their constituents. For example, the identities of a lump of clay or a stone are determined by their constituents. Unfortunately there are objects whose identities are not determined simply by their constituents. Different cases of the ship of the Theseus given by Lowe[8] illustrate this point. A ship belonged to a hero Theseus in Greek legend was preserved in a harbour for many years after his death. Like many ships do, the ship named Theseus underwent continuous repairs and replacement of its parts, such as changing the masts, sails, wooden decks, and so on. Let us call the very ship that left the port for its maiden voyage as T1 and the ten years old Theseus as T2α. Ten years was quite long time, so that, in order for the Theseus to remain seaworthy, it needed extensive repair, so much so that the original parts that T1 consisted of were all replaced. Despite the fact that T1 and T2α did not share the same physical parts, people would still considered T1 and T2α to be one and the same ship. This case-α indicates that constituents do not define numerical identity since the materially different T1 and T2α were considered to be numerically identical.

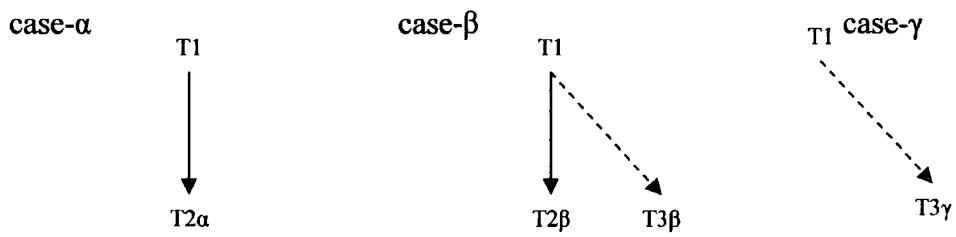
Suppose further that those old parts which were replaced had not been destroyed but had been stored away in a warehouse. Then one day, those original parts were brought together to build a ship, let us call this reconstructed ship the Theseus T3β. In this second case (case-β) there were two resulting ships, the repaired ship T2β which was in the harbour and the reassembled ship T3β which was in the warehouse. The first difficulty of change is to determine which of the two was numerically identical with the original ship T1. T1 and T3β are qualitatively identical in every sense. So logically T3β should be considered as

[8] Lowe, E.J. (2002), *A Survey of Metaphysics*, (Oxford, Oxford Univ. Press), p.25

numerically identical with T1. But the case-α suggests it is T2β and not T3β that is numerically identical with T1. Why do we normally regards T2β to be numerically identical with T2?

To make the matter more complicated, let us suppose an another case, case-γ, in which the repaired ship does not exist. The numerical identity judgement we made in case-α and β suggest that T3γ is not numerically identical to T1. But in case-γ we would recognise T3γ to be numerically identical with T1. This is because, as Lowe[9] points out, like a camping tent which goes through the same process and maintains its numerical identity, case-γ is simple dismantling and reassembling.

[Fig. 4.2] Three basic cases of the Theseus



This case indicates inconsistency in numerical identity judgment. Despite the fact there is no difference between T3β and T3γ, only T3γ was recognised to be numerically identical with T1 but not T3β. If realists are right, there would be a solution that finds a consistency among these case.

This problem of constituent change and numerical identity is not limited to artefacts. The same problem can be applied to humans and other organic beings. Everyday, a human individual intakes the necessary materials, such as protein, carbohydrate, fat, water, vitamins and minerals, from the environment in order to sustain its existence. A human intakes those materials by eating and drinking. Once the materials are consumed, they turn into parts of one's body; the flesh, bones, blood and so forth. As a result they are no longer distinguishable from the body; they are now parts that make up the body. On the other hand, materials are also constantly disposed from the body in the forms of excrement, sweat, and the shedding of skin cells and hairs. Hundreds of dead cells are discarded from the

[9] Lowe, E.J. (2002), ibid, p.27.

body everyday. The following scientific data gives an idea of how intakes and discard of materials at a molecular level.

[Tabel 4.1] Elements and periods that minerals stay in the body[10]

Elements	Volume (gram)		Location	Half life	Sources
	In body	Daily intake		(days)	
Carbon	16000	300	All tissues	40	Any foods
Phosphorus	780	1.4	Direct excreted	0.5	
			Cells	2	Food additives
			Soft tissues	19	
Sodium	100	4.4	Bones	10-500	Table salt
			Other tissues	10	
Potassium	140	3.3	All tissues	30	Vegetables, fruits & nuts
Calcium	1000	1.1	All tissues	no-data	Daily products, beans
Chloride	95	5.3	All tissues	10	Table salt

*Volume in standard-man (70g) + volume of daily intake

** Length of time it takes for an amount of molecules to become half of the original volume

The above three cases of the ship Theseus and half lives of various material illustrate that, in some cases, two different sets of material are considered to be numerically identical, while in other occasions, the identical sets of matter can be regarded as numerically distinct. Any theory that regards ordinary objects to be concrete particulars has to be able to distinguish between a case where two different collections of matter are considered to be numerically different things and the other case where two different collections of matter are numerically one and the same thing.

4.2.2.2. The problem of qualitative change

The changes that things experience are not only constituent change but also qualitative change. What I refer as qualitative change includes structural change, change of properties and kind to which the object belongs. What I refer as structural change is topological change, change in the arrangement of constituents. A collection of matter can be rearranged to change its shape. Imagine the Theseus sailed out into an open ocean for a war, but it was separated from its fleet and lost its bearing. A hundred days later food was running low and seeing neither enemy

[10] *International Commission on Radiology Protection*, Publication 30, Part1-4.

ship nor allied ship, crews turned the ship into a fishing vessel using some of ship's existing parts. Although the original ship T1 and the restructured ship T2δ were made out of the same collection of matter, they had different structures. In a such case, although the ship T2δ had changed its structure, T2δ may had still be judged as numerically identical with T1. Imagine a different scenario, case-ε, in which the Theseus had been washed up on a beach. Because the crews had been unable to free the ship, they gradually rearranged the ship's structure into a building. The ship T1 and the building T2ε were made out of the same collection of matter, yet it is debatable whether they can be considered as a numerically identical objects. It is possible for an object to experience gradual yet extensive structural change which leads to no structural similarity between the object before and after the change. These examples indicate that some structural changes alter numerical identity but others do not. If realists are correct, there must be a definite boundary between structural change that alters numerical identity of the object and one that does not.

Normally constituent change and structural change would bring changes in properties. Let us reconsider the second case of the Theseus again. The second case (case-β) is where there were two resulting ships, the repaired ship T2β and the reconstructed ship T3β. Being a warship, the Theseus had upgraded its armours and equipment in order to match the effectiveness of enemy ships. Therefore it is possible that T1 and T2β were different not only in their material constituents but also in their properties such as durability, manoeuvrability, and so forth. Moreover, if T3β had been constructed using the exact same parts and the original design of T1, T3β would had been qualitatively identical to T1 in every aspect. This increases the difficulties regarding cases α, β and γ. Why would we judge T1 and T3β that were materially and qualitative identical ships to be numerically distinct, yet T1 and T2 that were neither materially and qualitatively identical to be numerically identical? Why T3γ but not T3β to be numerically identical to T1 even though T3γ and T3β are identical in every aspects?

Traditionally, location is also considered to be a criteria for numerical identity. It is based upon the idea that two objects cannot share or exist in the same location. Imagine two identical toys come out from the same mass production line one after

the other. It is possible that they have identical structure and identical intrinsic properties, but the two toys are numerically distinct because they do not and cannot occupy the same location. Disagreement and agreement of location, however, do not define numerical division. Wiggins illustrated this point using the following example:

> during the Festival of Britain the stone in Meriden, inscribed to show that it marks the reputed centre of England, was removed from Meriden to London to be put on show... Well, during transport it will have remain the same stone but not the same landmark as the Meriden stone. Moreover, after its return to Meriden, it is questionable whether it is any longer that same landmark. After its return, old villagers alleged that it was put back some yards away from its old site.[11]

In this example, change of location (i.e. moving the stone from Meriden) did not alter the numerical identity of the stone. We have already looked at the problem of location as a criterion of individual in section 3.2.1. The dismantling watch and the possibility of time travel making it possible for the same individual to be in more than one location at the same. Again, any theory of numerical identity must be able to distinguish between the two kinds of disagreement of location, one which defines numerical division and the other which does not.

The change of kind to which an object belong to is related to all of the changes mentioned above. With the structural change of the Theseus we saw the ship change the kind which it belongs to from a warship to a fishing vessel or to the building. As the case-ε indicated, there are some changes in kind that alter the object's numerical identity, and others, such as case-δ, that do not. Therefore, some changes of kind alter the numerical identity of the object, and others do not. For any theory of numerical identity to be plausible, the theory must be able to distinguish between the two types of kind change.

So far I have analysed the problems of change regarding inanimate objects, but these qualitative changes are not limited to inanimate objects. In fact,

[11] Wiggins, David (2001), *Sameness and Substance Renewed*, (Cambridge; Cambridge Univ. Press), p.34.

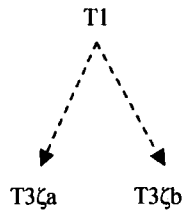
qualitative changes that a person goes through in his life may be more noticeable. Physical appearance, such as height, weight, colour of hair and skin complexion do not remain the same all through one's life. Properties such as personality, habits, mental capacity, and preferences and so forth would also change with age. For example, a restless child can grow up to be a calm person, and a shy person can grow up to be an outgoing person. Tastes in music and clothes also change over the years. Relational properties of a person and the kind the person belongs to can also change. A kind to which the person belongs normally changes according to the person's relational properties, such as social position and function, so that a change of relational property and a change of kind often coincide with each other. In our lives, we learn and gain the ability to perform new skills, and according to attained skills and knowledge our status as student, butcher, doctor, engineer and so forth change. Some time we also change our social status without gaining any ability. For example, we can become a father or an uncle and so forth. As a result of these changes, it is possible that ten years old Richard (R10) has more things in common with 10 years old Simon (S10) than himself in his forties (R40). If the shared properties are determined by numerical identity, then R10 would be considered to be numerically identical with S10 rather than with R40. But our common numerical identity judgement contradicts that. So why in some cases does similarity define numerical identity but in others it does not. If realists are right, there must be a definite boundary between two kinds of similarities.

4.2.2.3. The problem of fission and fusion

The problem of fission and fusion is a combination of the above three problems of numerical identity; the problem of natural unity, constituent change and qualitative change. Let us firstly consider fission where one object is split into numerically two or more objects. The second example of the Theseus (case-β) illustrated this point. In the original example, the repaired ship (T2β) and the reassembled ship (T3β) had different relationships to the original ship (T1). But imagine a similar case (case-ζ) where T1 was put in a dry dock and dismantled into bits, and the dismantled parts are separated in two. At the later date, using the two bundles of parts, additional parts and the original drawing of T1, two identical

ships (T3ζa and T3ζb) were built.

[Fig.4.2] Case ζ of Theseus

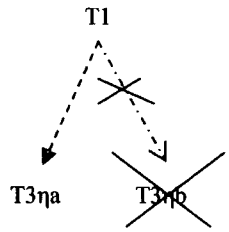


The case-ζ is more difficult to determine the numerical identity than case-β, as the both of the resulting ships had an identical relation to the original ship T1. In such a case, there are three options;

1) Only one of the resulting ships is numerically identical with the original ship T1;
2) Both T3ζa and T3ζb are numerically identical with T1; and
3) Neither T3ζa nor T3ζb is numerically identical with T1.

If we take the first option, then the realist has to find the difference between T3ζa and T3ζb in order to explain why one of them is numerically identical with T1 but not the other. This is not possible because they are identical in every aspects. The second option faces *the problem of transitivity*. If T1 = T3ζa and T1 = T3ζb are true, then it follows that T3ζa = T3ζb. T3ζa and T3ζb are, however, two numerically distinct ships capable of existing in two different locations. In order to take the second option, the realist must come up with a solution as to why the logic of transitivity does not work. The third option is to consider when the original ship was taken apart, a part which was a constituent of Theseus ceases to be a part of Theseus and becomes 'a part which used to be a constituent of Theseus'. The resulting ships that were constructed from 'parts that used to be Theseus' were not numerically identical with Theseus. The third option, however, also faces a problem similar to the problem case-γ illustrated. Imagine case η where the second bundle of parts is not used to build a ship. In this case we would recognise the reassembled ship (T3ηa) to be numerically identical to the original ship T1.

[Fig.4.4] case η of Theseus



If the realist's belief in numerical identity were correct, there would be a definite distinction between T3ζa and T3ηa; one that is not recognised as numerically identical with T1 and the other that is regarded to be numerically identical with T1.

Wiggins provided a thought experiment[12] which illustrates a similar problem to case-ζ. Inspired by cases of split brain patients, Wiggins imagined an operation in which a brain is divided and each half is housed in a brainless body. Let us call the original individual Andy. If the operation is successful, there would be two distinct bodies and consciousness that equally demonstrate Andy's memory and characteristics. To determine the numerical identity of the resulting two people, there are three options available to the realits that are same options available in case-ζ of the Theseus. The options are:

1) Only one of the resulting people is numerically identical with Andy;
2) Both resulting people are numerically identical with Andy; and
3) Neither of the resulting people are numerically identical with Andy.

Regarding personal identity, the first two options face the same difficulties mentioned earlier, but the third option faces further problems. Parfit provides a problem that derives from memory. Imagine Andy has a memory of listening to Beethoven's Symphony No.9. After the operation two resulting people are asked whether or not they have heard the music before. If we take the third option seriously, then even though the resulting people have a memory of the music, they have to answer they have not, because it is Andy who has heard the tune and they are not numerically identical with Andy. There is also a practical problem with the third option. If the resulting people were regarded as numerically distinct from the

[12] Wiggins, David. (1967), *Identity and Spatio-Temporal Continuity*, (Oxford; Blackwell), p.50.

original person, then anyone can escape criminal prosecution. Imagine that Andy committed murder and before he was caught he underwent Wiggins' operation. If we consider the resulting people to be numerically distinct from the original Andy, then he can escape criminal prosecution. Even though the two resulting people have the memory of committing the crime, they can claim that it is Andy who committed the crime and not them. Parfit pointed out a further problem of fission in the following example.

> Suppose that the bridge between my hemispheres is brought under my voluntary control. This would enable me to disconnect my hemispheres as easily as if I were blinking. By doing this I would divide my mind. And we can suppose that when my mind is divided, in each half, bring about reunion.
> This ability would have obvious uses. To give an example: I am near the end of a math exam, and see two ways of tackling the last problem... There were two features of the case of the exam that made us want to say that only one person was involved. The mind was soon reunited, and there was only one body. If a mind was permanently divided and its halves developed in different ways, the point of speaking of one person would start to disappear.[13]

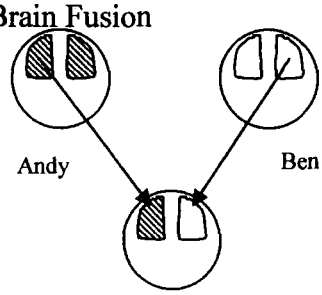
The question which Parfit's thought experiment provokes is what is the difference between this case and Wiggins' case? In Wiggins' case, the experiment results in two numerically distinct individuals, whereas in Parfit's case, two streams of consciousness still belong to one and the same person. The realist must be able to explain why the former results in two distinct individuals, but not the latter.

Let us now move onto the problem of fusion using a thought experiment similar to those provided by Wiggins and Parfit. If brain hemispheres can be separated and housed into different bodies, then we can imagine an experiment involving not only Andy but also a second person Ben. Both Andy and Ben

[13] Parfit, Derek (1971), "Personal Identity" in *Philosophical Review*, vol.80. I use reprinted version in Honderich, T. & Burnyeat, M. (eds.), *Philosophi As It Is*, (London; Penguine Books), p.189

undergo the first part of Wiggins' operation, so each brain is divided into two halves. Instead of housing four hemispheres into four different bodies, let assume that the left half of Andy's brain and the right half of Ben's brain were connected and put into a brainless body.

[Fig. 4.5] Brain Fusion



In such a case of fusion, what is the identity of the resulting person? Parfit gives an explanation of what will possibly happen to such person.

> To give examples – first, of compatibility: I like Palladio and intend to visit Venice. I am about to fuse with a person who like Gitto and intends to visit Padua. I can know that the one person we shall become will have both tastes and both intentions. Second of incompatibility: I have red hair, and always vote Labour. The other person loves red hair, and always votes Conservative. I can know that the person we shall become will be indifferent to red hair, and a floating voter.[14]

As we can see from these examples, unlike cases of fission, fusion would bring a change of personality which makes numerical identity before and after the operation more difficult to determine. In the case of fusion, because it can bring a change of personality it is more likely that the resulting person will be recognised as numerically distinct from the original. A similar problem is demonstrated by Parfit's thought experiment which I mentioned earlier. At the end of solving the maths problem, he fuses the two streams of thought. If the separation of the two streams of the consciousness is over a short period, it does not cause any difficulty in determining the numerical identity. If, however, the separation is over a long

[14] Parfit, Derek. (1971), ibid. p.199.

period, long enough for the two streams of consciousness to develop different opinions or preferences, then it is quite complicated to make a numerical identity judgement about the consciousness before and after the fusion. In order to overcome this problem, the theory of numerical identity has to define how long the separation must be in order for the person to alter his numerical identity.

4.2.3. Summary of numerical identity problems

All problems of numerical identity can be considered as problems of unity. The problem of natural unity is about what unites constituent parts to make up a single concrete particular. The problem of change is what unites temporal parts that are different from each other to compose a single concrete particular. If the realist is correct, there must be something in reality that unites different temporal parts, and there must a clear division between a temporal part that belongs to the numerically identical concrete particular and a temporal part that does not. Any theory of numerical identity must be able to provide evidence that such objectively legitimate division exists and our judgement of numerical division is based on the way mind-independent reality is and not products of human invention.

As we have seen there are so many ways for things to change; constituent change, structural change, change of intrinsic property, change of relational property, and change of kind they belong to. Each of these different types of change is divided into two; one that alters numerical identity and the other which has no influence upon numerical identity. In order to defend the plausibility of realism, realists' theory of numerical identity has to prove that there is definite division between the two kinds of change in all of these problems mentioned above. In other words, the realist must produce a plausible theory which gives definite answers to these problems. So let us now look at theories of numerical identity to see whether any theory can answer these questions.

4.3. Theories of numerical identity

So far we examined difficulties and problem of making definite numerical identity judgement. These problems seems to suggest that there is no particular

criteria according to which we make numerical identity judgement. This finding seems to oppose realist's belief in numerical divisions that there should be no ambiguity and inconsistency in correct numerical identity judgement because numerical divisions are intrinsic to the mind-independent reality. Contrasting to realists, it is easy for Zen to accommodate the problems of numerical identity and existence of inconsistency. According to Zen, the inconsistency are results of the fact that human values, such as preference, convenience and social consensus, influence our numerical identity judgement. This section of the chapter looks into various theories of numerical identity to see whether they can solve problems and find underlining consistency in our numerical identity judgement. It has to be noted that theories I will describe below are "realist's interpretations of" theories of numerical identity, and the theories in their original forms do not necessary imply numerical identity to be intrinsic to the reality. It is possible to accept a theory of numerical identity as a matter of convenience without believing what we perceive as individuals to be genuine individuals. These theories simply analyse how we can make judgement about numerical identity. This is why I have to emphasise that theories described below are realist's interpretations of theories of numerical identity.

4.3.1. The substratum theory of identity

The basic concept of the substratum theory of identity was introduced by Aristotle[15]. However, what is known as the substratum theory is an anonymous theory that different philosophers from different points in history supported and developed. The substratum theory I present here is not the theory proposed by one particular philosopher, it is rather what I consider to be the most plausible form of the theory. Concerning the problem of natural unity, there are disagreements amongst substratum theorists. Some argue that there is no natural unity, so that only the simplest or mereological atoms possess a proper identity and a complex or composite object is not an ontologically single united entity. Others argue that there are ontological or metaphysical foundations for a complex object to be a single entity. Since we are interested in the plausibility of ordinary objects to be

[15] *Metaphysics*, 1017a22 and 1038b10

genuine individual entities, this section of the essay concentrates on the latter version of the substratum theory.

The basic idea of the substratum theory is that different stages of the object's career and different constituents of the object are united by belonging to one and the same substratum. As long as the object remains to be one and the same substratum, even if it undergoes extreme changes and its attributes or material constituents change, the object remains numerically identical. This enables substratum theorists to solve the problems of change, because it allows a substance to possess or be associated with different and sometimes contradicting attributes. The substratum theory can support realism since it explains numerical identity, to be defined simply by whether or not x and y are the same substratum, and there is no room for human values to influence numerical identity judgement. This is how the substance theory successfully solve the problem of change illustrated by the examples of Richard and Simon. R10 and S10 are two distinct substance, whereas R10 and R40 are numerical identical because they both belong to one and the same substance that is referred by a word "Richard".

Although the substance theory solves the problem of change and numerical identity concerning animate objects, it is not quite clear whether the idea of substance can be extended to artificial objects such as the ship Theseus. It does not provide definite boundary between what are numerically identical with T1 and what are not. Another damaging problem for the substance theory of numerical identity is the problem of *inconceivability*. In order to avoid the problem of change and identity, substratum must not be associated with any attribute. The substratum has to be allowed to change any attributes without altering its numerical identity. Substratum is therefore defined as "something I know not what[16]". All we directly experience or are aware of are its attributes, and not the substratum. Then, it is a mystery or even absurd to think that we can ever make an correct identity judgement based upon substratum which we cannot know anything about. Descartes argued even thought we have no perception of substance, it is still possible to make correct identity judgement appealing to reason. It may be possible for to make identity judgment of wax based on reason,

[16] Locke, John (1690), *Essay Concerning Human Understanding*, Vol.II, 23.2 and 23.6

but it is difficult to see how reason can solves difficult cases of numerical identity judgement I mentioned in section 4.2.

4.3.2. Essentialism

Like the essentialism we have seen in the Chapter Three (section3.2.2.), the essentialist's view on numerical identity are that numerical division is determined not by entire property, but by a certain essential property or properties. In order for *x* and *y* to be numerically identical, they have to be qualitatively identical only in their essential property, and they can be different in their non-essential properties. The theory argues that numerical identity is determined solely by an essential property or a set of essential properties the individual possesses and there is no room for human values, such as preference, convenience and social consensus to influence numerical identity. An essential property can be summarised as follows:

Def-1) An essential property must be present at all time in an object in order for it to retain its numerical identity. In other words, any property whose absence does not alter the object's numerical identity is not an essential property, but an accidental property.

In addition to the above definition, some essentialists also assume the following definition:

Def-2) If a certain property Px is an essential property for being x, then at any given moment, there is only one object which possesses Px. In other words, there cannot be two or more objects that share essential property.

Like Lowe[17], I refute Def-2, based upon the following reason. If numerical identity is always defined by a single property, then Def-2 is true, but it is possible that numerical identity is defined by a set of properties. Let's take three properties, being Japanese (Pj), being a post graduate student in Philosophy (Pp) and being a

[17] Lowe, E.J. (2002), ibid. p.98.

martial artist (Pm). Independently, each property picks up more than one individual, but the combination of the three properties picks up only one individual, Yasushi Ihara. I believe that our common way of comprehending numerical identity is not based upon a single property, but upon a combination of properties. I do not dismiss the possibility that some numerical identities may be determined by a single essential property, but in most cases it is a set of essential properties which defines numerical identity.

If essentialism is true, then there must be at least one property or aspect of the object which remains true to the object through out its entire history. But is there such a property? What is the essential property that defines the numerical identity of the Theseus? Is there such a property which the original Theseus (T1) shared with the repaired Theseus (T2β) but not with the reconstructed Theseus (T3β)? Is there such a property which remains true through out my entire life? The objection against essentialism is that it may be specific about the definition of the essential property, but in most cases of change no actual property fulfils the criteria of essential property which essentialism defines.

Another problem is that sometimes, qualitatively identical objects are not regarded as numerically identical. This problem can be addressed using an example which I would called "the problem of the reunited candle" which was inspired by Lowe's example of a tree[18]. Imagine a jasmine-scented candle which is pale blue, spherically shaped and made out of 1000 atoms; a1, a2...a1000. It was lit one night and it burned away. In our eyes, it seemed to disappear, but in fact the atoms that composed the candle were simply scattered. Although it is unlikely, it is theoretically possible that after a million years, these 1000 atoms happen to be gathered to make a spherically shaped jasmine-scented pale blue candle. Let's call the original candle C1 and the reunited candle C2. We can imagine that they are identical in every aspect. According to the essentialism, C1 and C2 should be recognised as a numerically identical candle, since they are identical not only in their constituents and structures but also in their intrinsic

[18] "Suppose, for instance, that all of the atoms composing a certain tree where to be dispersed throughout the universe for many years, becoming parts of various other objects during that time, but that at some much later time they were to come together again by chance to form a tree, exactly similar to the original tree. Would this original tree be numerically identical with the much later tree? Surely not." Lowe, E.J. (2002), ibid., p.31.

properties. Our common sense, however, would contradict this decision and to say C1 and C2 are numerically distinct candles. This seems to suggest that our numerical identity judgement is not based on essentialism, and there are some other criteria that define numerical identity. If numerical identity is determined by essential property as essentialism claims we must dismiss our common judgement simply as a result of ignorance or mistake. But would it be possible to dismiss them as such?

A similar point is addressed by he change Theseus underwent. If possession of the identical intrinsic property or properties determines numerical identity, since T3β and T3γ are qualitatively identical in their intrinsic properties, not only T3γ but also T3β should also be judged as numerically identical with T1. Some may suggest that although T3β and T3γ are qualitatively identical in their intrinsic properties, they may differ in their relational properties. For example, T3β and T3γ may not be different in themselves, but their environments and their relations to T1 are different. But could a relational property satisfy the criteria of the essential property? I believe it cannot since there are many examples that show that a change in relational property does not alter an object's numerical identity. For example, changing the relational property of who the commander of the ship is, does not alter the numerical identity of the ship. It seems that essentialism is plausible as a theory, but since it fails to provide an answer as to which actual property can be an essential property, it is not a practical solution to the problems of numerical identity.

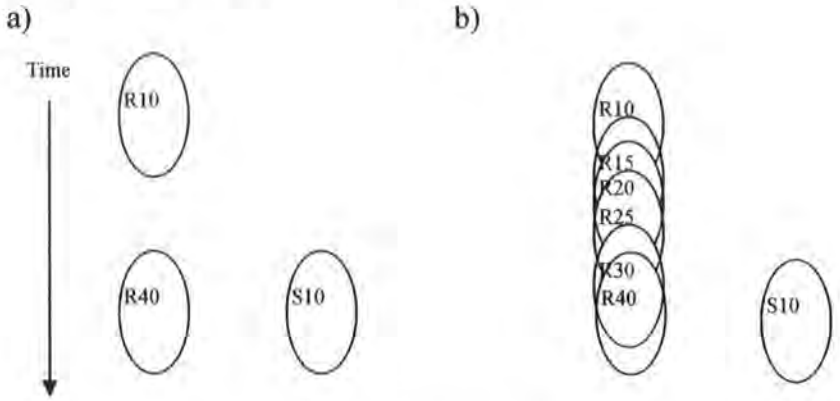
Other difficulties that essentialism faces is that it does not offer any answers to the problems of natural unity, and the problems of fission and fusion. In this sense again essentialism fails to be a practical theory of numerical identity.

4.3.3. The continuity theory

The continuity theory assumes spatio-temporal continuity to be a necessary criterion for numerical identity. Continuity theory can allow an object to change its entire constituents, structure and properties yet remain numerically identical, providing that the existence of the object before and after the change is continuous. The idea of the continuity theory is based upon an assumption that change is

gradual. Let me explain this using the example of Richard and Simon.

[Fig.4.6] Continuity and discontinuity



The continuity theory can correctly acknowledge R40 to be numerically identical with R10 and numerically distinct from S10 because there is a continuity which exists between R10 and R40, but not between R10 and S10. Although R10 and R40 possess more differences than similarities, at least R10 and R11 (eleven years old Richard) would have more things in common than difference, so that they are easily perceived as numerically identical. In the same manner, R11 and R12 (twelve years old Richard) can be identified as the same concrete particular. Then according to the transitivity of numerical identity, we can confirm that R10 and R40 are numerically identical, (R10 = R11 = R12 = … = R38 = R39 = R40). The Continuity theory can also accommodate the problem of fission illustrated by case-ζ. According to the logic of transitivity, if T1≡T3ζa and T1≡T3ζb are both true, then it follows that T3ζa ≡T3ζb. This conclusion does, however, contradict our common sense that T3ζa and T3ζb cannot be numerically identical (e.g. the port authority would never let the owner to get away with one marine licence between two ships). According to the continuity theory, even though T1≡T3ζa and T1≡T3ζb are true, there is no direct continuity existing between T3ζa and T3ζb, therefore they are two distinct ships. This allows the continuity theory to judge both T3ζa and T3ζb to be numerically identical with T1, yet they themselves are numerically distinct from each other. It also accommodates the problem of dismantling and reassembling, illustrated by case-γ of the Theseus. According to the continuity theory even though the Theseus was dismantled, its parts never ceased to be parts of the Theseus as long as they do not become parts

of something else. In other words, although those parts do not constitute a ship, they do not cease to be parts of the Theseus. This argument is reinforced by the case of the reunited candle. The original candle (C1) and the reunited candle (C2) are numerically distinct, based on two reasons. Firstly, their existences are not continuous. Secondly, during the discontinuous period, the molecules that compose C1 became parts of something else and cease to be parts of the candle. In this way, the continuity theory successfully explains why T3γ is numerically identical with T1 but C2 is not numerically identical with C1.

The continuity theory can allow changes to occur without altering numerical identity, but the theory may be too generous. Supposing that a mouse died in an isolation tank, and before it did, the mouse ate a spore. As the result, a mushroom starts to grow from within the mouse's decaying body. Although the change from the mouse to the mushroom is gradual and their existence is spatio-temporally continuous, we would not recognise the mouse and the mushroom to be numerically identical. In other words, the continuity theory fails to distinguish, the mouse-mushroom change from cases of metamorphosis such as caterpillar into butterfly or tadpole into frog in which the organism before and after the change is numerically identical.

Moreover, the continuity theory, like essentialism, fails to provide any answer to the problem of natural unity. It has nothing to say about what makes certain composite objects to be single entity and others to be collections of entities. In this sense the continuity theory is not a plausible theory of numerical identity.

4.3.4. The sortal Dependency Theory

According to the sortal theory of numerical identity, we cannot simply ask whether or not x and y are numerically identical. We have to specify in what context the numerical identity of x and y is questioned. In other words, according to the theory, all identity statements must take the form of "x is the same f as y." The advantage of defining numerical identity in this way is that it allows x and y to be different in some respects, yet be numerically identical since it is acceptable for x to be same f as y, yet x is a different g as y. There are two kinds of sortal

theory; the sortal relativity theory proposed by Geach[19] and the sortal dependency theory put forward by Wiggins[20]. According to Geach, there is no definite answer to numerical identity because x and y can be numerically identical as well as distinct at the same time depending on in what sense identity of x and y are questioned. Unfortunately, the realist would not be satisfied with sortal relativity theory, since it allows the existence of an infinite number of numerical divisions that are equally legitimate. For example, the theory fails to recognise the difference between "x is the same collection of matter as y" and "x is the same ship as y" and considers the numerical identity these two statements express as being equally valid.

Wiggins comes up with a sortal dependency theory which solves this problem. The sortal dependency theory argues that the numerical identity between x and y is defined only by the *substance-sortal noun*. According to Wiggins, "Among the best candidates to play the roles of sortal and substantial predicates...are natural kind words." [21] This enables the theory to differentiate between the caterpillar-butterfly change and the mouse-mushroom change that the continuity theory fails to distinguish. In the former case, "caterpillar" and "butterfly" are both *phase-sortal nouns* of the same substance-sortal nouns taxonomically classified as insect (Insects)", order "Lepidoptera (butterfly)" or species "Maniola Jurtina (meadow brown)". In this way we can correctly identify a caterpillar and a butterfly to be numerically identical. Whereas in the latter case, "a mouse" and "a mushroom" are not phase-sortal nouns that share the common substance-sortal noun, therefore they are considered to be numerically distinct. The advantage of defining numerical identity with a substance-sortal noun is that the noun expresses a possible change which the object may experience. This allows an object to change its attributes and constituents completely, yet remain numerically identical providing that the change is implied in its substance-sortal noun. For example sortal noun "butterfly" implies the change from caterpillar to butterfly, but "mouse" does not permit the change into a mushroom. This enables the sortal dependency theory to correctly recognise the butterfly and the caterpillar to be

[19] Gearch, P.T. (1962), *Reference and Generality*, (N.Y.; Cornell Univ. Press),
[20] Wiggins, David. (2001), ibid., p.77.
[21] Wiggins David. (2001), ibid., p.77.

numerically identical, and the mouse and the mushroom to be numerically distinct.

The problem of the sortal dependency theory is that it alone cannot solve the problem of change and numerical identity, since it is possible that the same substance-sortal noun can be applied to more than two numerically distinct objects. For example, even if the same substance sortal noun "person" can be applied to *x* and *y*, this does not mean they are numerically one and the same person, since there are billions of people in the world. In order to overcome this problem it is necessary for the sortal dependency theory to involve the continuity theory, and it seems that there is a happy marriage between the sortal dependency theory and the continuity theory. The continuity theory requires some way of distinguishing between the mouse-mushroom change and caterpillar-butterfly change which the sortal dependency theory can provide. And continuity theory provides the way to distinguish two numerically distinct objects that can be referred by the same sortal noun.

> "all it is necessary...is the following truth-condition, T, for an identity statement 'a=b'. If one locates each of the particulars a and b [under covering concept or concepts] and, where appropriate, sc. in the case of 'identity through time', traces a and b through space and time [under covering concepts], one must find that a and b coincide [under some covering concept *f*]."[22]

I believe, that the sortal dependency theory is in fact a truth condition for continuity theory, and not the other way around, because the sortal dependency theory can only be used when the spatio-temporal continuity between x and y is established. The theory should therefore be formulated as "*x* and *y* are numerically identical if and only if their existences are spatio-temporally continuous and they can be referred to by the same substance-sortal noun."

Even in conjunction with the continuity theory, the sortal dependency theory is far from being a plausible and problem-free theory. It does not provides what

[22] Wiggins David, (1967), *Identity and Spatio-Temporal Continuity*, (Oxford; Blackwell), p.35.

realists crave, the definite distinction between change that alter numerical identity and change that does not. Price's example of Rover-Clover illustrates this point.

> To determine the effects of the Martian atmosphere on higher animals, NASA sends Rover [a dog] to Mars. After a successful Mars landing and take-off, Rover returns to Earth, where he is continuously observed for six months. Film cameras recorded every moment of his existence. During this time, Rover undergoes a gradual change, so that by the end of the isolation period he is an amorphous mass of cells. Even the chromosomal constitution of his cell has changed: its nature is not identifiable as the sort of be found in members of any known kind of organism. To ascertain that it was something in the Martian environment that produced this transformation, NASA rockets other dogs of different breeds and ages – even a pregnant dog – to Mars. The result is the same in each case.
>
> No one can deny that the entity in the isolation unit at the end of interval in question, call it "Clover," is Rover, the object confined there six month earlier. That is, one cannot claim that Rover ceased to exist at some time during that period. For no organism *died*: the cell composing the spatiotemporally continuous Rover and Clover never ceased functioning. Yet, we cannot justifiably classify Clover as a dog. For the only biological significant property Clover shares with any dog that ever lived is the property of being composed of cells. And, as was just mentioned, even Clover's cells are unlike those of any dog (or anything else) in point of genetic make-up.[23]

The Rover-Clover case illustrates a problem of defining sortal noun "dog". If numerical divisions are as definite as realists hope, then there must be a clear-cut division between what kind of change ceases the creature to be a dog and what kind of change allows a creature to remain a dog. Let assume two kinds of change.

[23] Price Marjorie S. (1977) "Identity Through Time" in *The Journal of Philosophy*, vol.74, p.201-17

The first kind is a radical change such as described above, the change that makes Clover to be nothing like a dog. It removed all characteristics of a dog (e.g. Clover is a man-eating spider-like creature which is not recognisable as a dog). The second kind of change was a less radical change, a change that was a result of over-exposure to radiation or a chemical agent (e.g. the unrecognisable appearance of Clover as a dog was due to massive tumours all over its body and the break-up of its DNA). If we allow both Clovers to be numerically identical with Rover, then the sortal noun "dog" has to be abandoned. According to Price, if we allow Rover and Clover to be numerically identical, terms which can be used in f are limited to 'entity' or 'thing'. This denies the ability of the sortal dependency theory to solve the problems of Theseus, "T2β is the same *thing* as T1" and "T3β is the same *thing* as T1" are equally true.

Alternatively, if we assume Clover to be numerically distinct from Rover, then, the problem of determining how much change Clover has to experience in order for the substance sortal category of "dog" to be not applicable to Clover. Moreover, if Rover and Clover are numerically distinct, at which point in time does the biological mass in the isolation tank ceases to be a dog? The Rover-Clover case is different from the mouse-mushroom case because in the latter, the mouse ceased to exist and its corpse became the mushroom, whereas in the former case Rover did not cease to exist. But to say Clover is not a dog, there must be some point in time at which the entity in the isolation tank ceases to be a dog. The creature (Rover) which was put in the tank on the first day was a dog, but 183 days later the creature (Clover) in the tank is not a dog. We can divide the six months into 4392 hours and into 263520 minuets, and yet we cannot pin point at which point the creature in the tank ceased to be a dog. There seems to be no definite objective difference between the mutation of an unknown kind and the mutation as the result of radiation. This obviously contradicts realists who believe numerical division to be intrinsic and definite. The problem of the sortal dependency theory comes down to the problem of natural kind which this thesis discussed in the previous chapter. Wiggins assumed that there is a special class of category called the natural kind which defines the substance-sortal category. Contrary to what Wiggins assumed as we have seen in the previous chapter, there

is no such category called natural kind. What we considered to be natural kinds are 有為 (samskrta) and 空 (śūnya). They are something we invented in order to simplify the complex matters of the reality. As the result, numerical identity judgement is also matter of preference, convenience and social consensus.

4.3.5. Numerical division as 有為 (samskrta)

I have examined four theories of numerical identity to see whether any of them can support the realist's belief in numerical divisions. Realists believe numerical divisions that define 名色 (nama-rūpa) are determined by the way 寂滅 (nirvāna) is actually divided and not by human values. This implies numerical divisions are definite and any disagreement and discrepancies are result of ignorance. In order to defend such a view, four theories of numerical identity were tested to see whether any of them can provide definite answers to problems of natural unity and of change. All theories fail to resolves these problems or to demonstrate numerical divisions that define 名色 s (nama-rūpas) to be definite. The question now is if not 寂滅 (nirvāna) then what determines numerical divisions? Zen thinks all divisions between A and not-A we perceive are products of human invention. As Garfield and Huntington described, numerical divisions are drawn in accordance with human values such as preference, convenience and social consensus. Shoemaker and Swinburne[24] provided an example which defend a relativist's view of numerical identity similar to that of Zen. Suppose two halls; Alpha Hall where Smith has his office and Beta Hall in which Jones has his office. Historically Alpha Hall and Beta Hall were independent buildings, but five years ago a foyer was built to connect the two structures. For those who know the history, a phrase "the building in which Smith has his office" means Alpha Hall, whereas for others who do not know the history, the phrase denotes the entire structure rather than just the Alpha Hall. If realists were right, then only one of these two meaning would be correct. It is, however, not possible to say one is the correct and the other is the incorrect use of the phrase "the building in which Smith has his office". If fact, meaning and truth value of the phrase is determined

[24] Shoemaker, S. & Swinburne, R. (1984), *Personal Identity*, (Oxford; Blackwell), p.146.

by knowledge of both a speaker and a listener, and not by the way the mind-independent reality is actually divided. For those who have worked in the university for long time the phrase "the building in which Smith has his office" means Alpha Hall, but for those who have just joined the university the phrase means the entire building structure that contains both Alpha and Beta Hall. Numerical identity judgement is influenced not only by knowledge but also by convenience. Different numerical identity conditions applied to different things reflect their relation to us. The numerical identity of the Theseus is related to its function as ship, as a warship or as a memorial to the war hero. As a ship, Thesesus ceases to be numerically identical with T1 when it ceased to be seaworthy (for example dismantled or turned into a building on the beach). As a warship, it ceases to be numerically identical with T1 when it turned into a fishing boat. As a memorial to the war hero Theseus, it can remain to be numerically identical with T1 even when it ceases to be seaworthy (its ladder was bolted and the keel was removed) but not when it turned into a fishing boat. The numerical identity of a person is related to his ability to interact with others, to take responsibility for his or her actions, and so forth. There are no definite answers to whether a split brain patient is a single individual or two individuals occupying a single body, whether a person who underwent Wiggins' operation is numerically identical to both resulting people or not, and so forth. There is no definite universal answer to whether people who suffer from amnesia or split-personality who commit crimes should be punished or not. Each case is judged differently according to our opinion about offender's mental health, awareness of his responsibility, memory of the crime, likeliness to re-offend and so forth. The important point here is that although the degree or severity amnesia or split-personality may influence judgement, there is no definite degree of amnesia or split-personality that determine whether the person should be punished or not. That is determined by human value of preference and opinions.

4.4. 無我 (anātman)

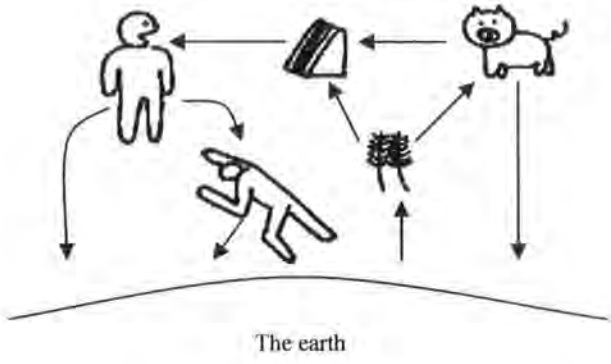
4.4.1. Is a section of a river a pond?

I have spent much of this chapter defining the problems of numerical identity

because they are exactly the arguments which support 空 (śūnyatā) of ordinary individuals (我; Selves). Concerning natural unity, the above realist's theories of numerical identity fail to show that dividing the world at the certain level is ontologically or metaphysically more significant than infinite numbers of alternative ways of dividing the world. This gives rise to an suspicion that the idea of natural unity may not have any metaphysical, ontological or even rational basis, rather it is a product of human invention. We bundle constituents together and assume the existence of some kind of unity in order to simplify the complex matter of reality. Based on such an assumption, we distinguish what does and does not belong to a certain object as its constituent parts, and we also draw a boundary between the composite object and its environment.

The problem of constituent change strengthens the view that there is no natural unity that draw the boundary between the individual and its environment. The continuous change of constituents which we looked at section 4.2.2.1. has a much wider implication regarding the identity of composite objects, than just the difficulty of determining the identity. A molecule which was a part of my body few days ago can now be a part of a plant, or a creature or whatever exists in the environment. The reverse is also true that what was once part of another organism or environment can be a part of my body. For example a bacon-lettuce-sandwich I had for lunch yesterday is now integrated into parts of my body. At t2 (before I ate the sandwich), the sandwich was not a part of me. I could clearly distinguish myself from the sandwich. But at present (t3), molecules that made up the sandwich are now part of me; my blood, my muscle and my cells. Let us now expand the time scale wider. At t1 (before the sandwich was made), the bacon in the sandwich was a part of a pig, and the lettuce and wheat that made the bread were parts of different plants. Also three hundred days from now (t4), all molecules which made up the sandwich are no longer in my body through excretion, shedding skin cells and hairs. Those molecules can well be parts of different objects; animals, insects, plants, inorganic objects or the environment.

[Fig.4.7.] The cycle of material exchange



This constant exchange of material between an individual and its environment indicates that whatever exists in the world may eventually be incorporated into my body, and what constitutes my body can become part of anything that exists in the world. This fact makes it difficult to draw a clear boundary between an individual being and its environment. To distinguish my body from its environment is as absurd as thinking a section of a flowing river to be a pond, as if it is somehow independent from the river. This is why Zen thinks 我 (Selves) are 空 (śūnya). What we perceive as individuals are not genuine individuals, and the numerical divisions we perceive are 有為 (samskrta) products of human invention. Therefore it is 幻 (māyā) and 顚倒 (viparyāsa) to believe in 名色 s (nama-rūpas) to reflect the way the mind-independent reality (寂滅; nirvāna) actually is.

Zen's idea of all numerical divisions to be 有為 (samskrta) appears to fit with an western philosophical idea called monism[25]. Monism is an idea that the entire world is one single entity and what we perceive as individuals are merely parts of the all encompassed entity. Despite similarities between Zen and monism, it is incorrect to identify Zen as monism. Zen is not monism because it does not affirm the entire universe to be a single entity, it only indicates that numerical divisions are 空 (śūnya) and not intrinsic to 寂滅 (nirvāna). As we saw in the

[25] There are two types of monism. One is the idea that there is only one *kind* of thing and the other is the idea that there is only one entity. The relation between these two types is contingent since it is possible to deny the latter without denying the former (there are many entities and they belong to one and the same kind of entity).

Chapter Two, the aim of analytical enquiry in Zen is to make us realise that what we experience and comprehend are 幻 (māyā) and 顚倒 (viparyāsa), so that we can be liberated from the second kind of 幻 (māyā) and 顚倒 (viparyāsa), our false belief in our ability to comprehend the mind-independent reality as it actually is. Analytical enquiry can only be used to deny our false beliefs and it can never reveal the way 寂滅 (nirvāna) actually is. So that Zen only denies the idea of world to be composed of individuals we believe to exist, and does not make a further step like monism to say that there is only one single entity in the universe. Moreover, to describe the entire universe to be a single entity violates the paradoxical statement to 空 (śūnyatā). As we saw in section 1.3.1., 空 (śūnyatā) is always expressed using paradoxical statement of "A and not-A" or "neither A nor not-A". According to this paradoxical statement, Zen denies monism as well as its opponent pluralism, because 空 (śūnyatā) should be expressed as "the universe is a single individual and a composite of individuals" or "the universe is neither a single individual nor a composite of individual". Monism is only half of what Zen aims to describe as the way 寂滅 (nirvāna) is.

4.4.2. 無我 (anātman; Non-Self) as a positive concept.

Despite the overwhelming amount of evidence most western thinkers try to defend the numerical identity of ordinary objects, because they believe that the denial of this only leads to non-productive nihilism. Lowe wrote;

> The whole world, for the conventionalist, seems doomed to merge into an amorphous lump in which there is no real individuality or distinctness, no genuine differntiation into multiplicity of particulars, apart from the divisions which we or people of other cultures impose or project upon the world through the filter of our thought and language. And then we must ask: what place can we ourselves have in such a world, seemingly so much of our own making? For we can hardly be supposed to make ourselves, in the objects of which we speak. If the only way to avoid the 'amorphous lump' conception of the world is to

> embrace essentialism, then at least essentialism has common sense on its side, for what that is worth.[26]

Why are people so scared of accepting that the world is in fact an amorphous lump and there is no genuine individuality or numerical distinctness? Zen actually agrees with them on one level but disagrees on another. Individuality and numerical distinctness that 名色 (nama-rūpa) suggests are useful and essential for us to carry out every day tasks. Therefore denying them will have devastating consequences and lead us to non-productive nihilism. What Zen aims to show is that they are useful and essential tools to simplify the complex matter of reality, but as the same time, it illustrates the importance of realising they do not accurately correspond with the way the world really is. The world is an amorphous lump, but we need to divide it into manageable chunks. We invent 名色 s (nama-rūpas) so that we can agree on how to divide the amorphous lump. But we must correctly understand that the individuality and numerical division which 名色 (nama-rūpas) suggest are not the way 寂滅 (nirvāna) actually is. Zen does not wish to deny the usefulness of individuality and numerical distinctness, but it aims to make us realise that they are merely tools. Like Parfit, Zen thinks the importance of numerical identity judgement surpasses the objective legitimacy of numerical identity. In other words, although numerical identity judgement may not be objectively legitimate, it is something useful and necessary for us to carry out our daily tasks.

The comprehension of 無我 (anātman; Non-Self) is of particular interest to Zen and Buddhism in general, because the comprehension is strongly related to liberation from 苦 (duhkha; suffering). It is believed that unawareness of 無我 (anātman) causes 苦 (duhkha) which derives from impermanence of Selves. One of the 苦 (duhkha) the unenlightened suffer from is the fear of death. Zen argues that the comprehension of 無我 (anātman) can liberate us from the fear of death or in fact death itself. Death is feared because it is the annihilation of an individual. An individual exists between two points in time; birth and death. Between these

[26] Lowe, E.J. (2002), ibid., p.113-114

two points despite the changes it undergoes, an individual maintains its numerical identity. For example an individual, Joan Miró, came into existence at his birth in 1893, and ceased to exist at his death 1983. Obviously Miró did not exist before 1893 and he has not existed since 1983. Between these points in time, Miró grew up, changed his appearance, personality, style in painting and sculpture, and even molecular constituents of his body, yet remained numerically identical. He can remain numerically identical despite these changes because numerical division maintains him to be separable and distinguishable from others and from his environment. Unfortunately, existence of an individual as a separable and distinguishable entity from others and its environment does not last forever. Nothing and nobody we perceive as an individual can exist forever. Impermanence arise from the death or the annihilation of individuality is inevitable. The impermanence of an individual is discussed frequently in Buddhism. In *Suttanipāda*, for example;

> For everything that is born, there is no escape from death...
> The young, the old...the wise and the foolish surrender to death,
> Everything certainly reaches death.[27]

Similarly *Darmapada*[28] mentions the inevitability of death in many places. What comprehension of **無我** (Non-Self) does is to make us realise that what we perceived to be an individual is **幻** (māyā) and **顛倒** (viparyāsa). What we perceive as an individual is not a genuine individual because it has never been separable or distinguishable from others or from its environment. This reveals that the matter of death arises from **幻** (māyā) and **顛倒** (viparyāsa). Cessation of an individual never occurs because the genuine individual has never existed in the first place. The relation between our false belief in an individual to be a genuine individual and the problem of death is expressed by **諸行無常**

[27] *Suttanipāda*, III, 8.
[28] *Dharmapada* (**法句経**), one of three most important texts for Theravāda (**上座部**). There are many passages that mention inevitability of death are, 41-48, 135, 147-152, 170, 235, 237, 240, 287-288.

(sarva-samskārā-anityāh), one of 三法印[29] (trilaksana; Three Marks of Buddhism). It means everything which is conditioned or created by us is impermanent. In other words, impermanence is applied only to 有為 (samskrta), things we invent or assume to exist. If we understand 無我 (Non-Self), then we realise that 不生不滅 (anutpāda-anirodha), nothing comes into existence and nothing goes out of existence, i.e. nothing is impermanent. In other words, there is neither birth or death, they are both 有為 (samskrta), products of human invention derived from 幻 (māyā) and 顛倒 (viparyāsa). This realisation liberates us from death, because we understand that there is no such thing in the first place.

4.5. Conclusion

This chapter and the previous chapter defend the idea of all divisions that define 名色 (nama-rūpa) to be 空 (śūnya), i.e. all divisions are 有為 (samskrta) products of human invention and no such divisions exist in the mind-independent reality (寂滅; nirvāna). Such understanding is important because 名色 (nama-rūpa) plays a crucial role in forming experience and knowledge. As we have seen in the Chapter One, in order to make sense of what we experience and comprehend we divide what it into different types and countable individuals using 名色 s (nama-rūpas) that are defined by qualitative divisions and 名色 s (nama-rūpas) that are defined by numerical divisions.

Because the unenlightened falsely believe in a division that defines 名色 (nama-rūpa) to reflect the way the mind-independent reality actually is, they suffer from 幻 (māyā) and 顛倒 (viparyāsa) in that the way they comprehend reality to be is the way the mind-independent reality actually is. In order to overcome such 幻 (māyā) and 顛倒 (viparyāsa), it is crucial for us to understand 空 (śūnyatā) of division which is directly linked to the 空 (śūnyatā)

[29]三法印 (trilaksana; Three Marks of Buddhism) is consist of sarva-samskārā-anityāh (諸行無常; everything which is samskrta (有為) is impermanent), sarva-dharmā-anātmānah (諸法無我; the absense of self and anything we perceived as an individual) and śāntam-nirvāna (涅槃寂靜; there is calmness and peace in nirvāna)

of 名色 (nama-rūpa).

Recognising numerical division to be 空 (śūnya) is of particular interest to Buddhism, since it is related to the concept of 無我 (anātman) and consequently the liberation from death. I explain practical implication of 無我 (anātman) in Chapter Eight.

Part 3

空 (śūnyatā) and metaphysical concepts relating to science

It is not possible to discuss metaphysics without mentioning space, time, causation and substance, because they are keys to our fundamental prospect of our surroundings. Since Zen recognises everything we comprehend to be 空 (śūnya), what we comprehend as space, time, substance and causation should also be 空 (śūnya). This part of the thesis therefore examines the plausibility of 空 (śūnyatā) regarding the above fundamental metaphysical topics and conclude that they are 名色 s (nama-rūpas) that are useful tools to make sense of our experience and knowledge but they are 有為 (samskrta) and 無自性 (asvabhāva) and they are both causes and consequences of 幻 (māyā) and 顛倒 (viparyāsa). As I stated above it is important to understand them to be 空 (śūnya) because they form the foundation for our view of reality.

To help demonstrate 空 (śūnyatā) of space, time, fundamental substance and causation, I will look into modern physics. I believe it is appropriate to employ modern physics because modern physics contradicts our commonly held views on these topics. Modern physics make us realise that everything we think we know about space, time, substance and causation is 幻 (māyā) or 顛倒 (viparyāsa) and it traps and distorts our understanding of 寂滅 (nirvāna). *Special relativity theory* and *quantum entanglement* contradict our comprehension of space and time. *The wave/particle duality* and *Heisenberg's uncertainty principle* suggests what we considered to be material substance is likely to be 空 (śūnya). *Probability density formula* and *Heisenberg's uncertainty principle* of quantum physics implies there is no such thing as causation and all events happen at random. In order to make modern physics comprehensible I will deal with all the above topics of modern science in Chapter Five. Although the chapter is titled as space and time, a substantial part of the chapter will be about modern physics and quantum interpretation, and not specifically about space and time. At least, once all relevant issues arise from modern physics are explained in Chapter Five, Chapter Six and Seven can be kept short and precise.

I must make absolutely clear that what I aim to do in this part is not justifying Zen's metaphysics using modern physics as evidence. Zen monks and scholars did not have some mystical precognition about modern physics, therefore it is absurd

to employ modern physics as proof of the plausibility of classic Zen. Instead I offer Zen concept of 空 (emptiness) as an inspiration for an alternative metaphysical theory. It is modern Zen I am presenting and not the Zen of past masters.

5.

Space and Time

名色 (nāma-rūpas) of space and of time play important roles in our comprehension of the world. Our ideas regarding space and time provide a framework within which we sort out what we experience and comprehend. As the unenlightened, we tend to assume space and time to be intrinsic nature of 寂滅 (nirvāna). In other words, we believe that three-dimensional space, distance, flow of time and simultaneousness to be intrinsic to 寂滅 (nirvāna). But according to Zen, everything we experience and comprehend is 空 (śūnyatā) and this should include both space and time. In order to prove that both space and time are 空 (śūnya), this chapter looks into modern physics which contradicts with our understanding of space and time and concludes that both space and time are 空 (śūnya). In other words, the mind-independent reality is not spatio-temporal.

5.1. 空 (śūnytā) of time

Time is something very familiar to us yet very puzzling. Everyday, we talk about time (what time the lecture starts, how long the lecture takes), we feel time (we get excited when the weekend arrives, we panic when deadlines are in a few days time) and we can even organise time (we can move appointments, we make time to go to the gym). Yet, when we are asked what actually is time, most of us fail to define what it is. St Augustine wrote in *Confessions* that "what then is time? If no one asks me I know: if I wish to explain it to one that asketh, I know not". Similarly, 道元 (Dōgen) wrote "The leaving and coming of the directions and traces [of time] are clear, and so people do not doubt it. They do not doubt it, but

that does not mean they know it."[1] This section looks at this puzzling nature of time and aims to conclude that we know nothing about time and what we comprehend as time is 名色 (nama-rūpa) which is 有為 (samskrta) and not intrinsic to 寂滅 (nirvāna).

5.1.1. Relativity of time.

There is no consensus among different schools of Buddhism regarding time. Sarvāstivādin school (説一切有部) affirmed the existence of three distinct times, the future, the present and the past. Mādhyamaka school (中観派) opposed such a position and claimed that even time is 空 (śūnya). It argued that what we understand as time (future, present and past) is 有為 (samkrta), a product of human invention and not intrinsic to 寂滅 (nirvāna). Zen's idea of time derives from this Mādhyamaka school's idea of time. Like Mādhyamaka, Zen argues what we comprehend as time is 空 (śūnyatā), so that what we think as flow and sequence of time are not intrinsic to 寂滅 (nirvāna) and they are 有為 (samskrta), products of human invention and something that are conditioned by human values such as preference, convenience and social consensus. This idea can be defended by demonstrating what we perceived as flow and sequence of time are relative to function of mind. Austin[2] provides two psycho-physical experiments that shows how our mind influence our understanding of time. Lehmann's study[3] showed that what we consider as a moment of *now* is not scientific sense of now as a non-stretched point in time, but it has certain duration spread anything between 10 and 100 millisecond. What this means it that our judgement of which events are simultaneous is not definite and what we judge as simultaneous may not be actually simultaneous. Suppose an event B occurred 50 millisecond after an event A. Some may consider A and B to be simultaneous while others think they are not. Milner[4] analysed how the brain damage

[1] 道元 (Dōgen)『正法眼蔵』(*Shōbōgenzō*),「有時」(being-time).
[2] Austin, James H. (2000), *Zen and the Brain*, (Cambridge MA, U.S.A.: The MIT Press).
[3] Lehmann, H. (1967), "Time and psychopathology", in *Interdisciplinary Perspectives of Time: Annals of New York Academy of Science*, vol. 138, p798-821.
[4] Milner, B. (1971), "Interhemispheric differences in the localization of psychological processes in man", in *British Medical Bulletin*, vol.27, p.272-277.

influences the comprehension of time sequence. Study showed that brain damage patients could not often put event in right chronicle order. They got muddled up about sequence of which event came after which. This indicates that our judgement of time sequence requires brain process and what we see as a sequence of event is actually a mental image or a memory of the event reconstructed in our mind and not actual sequence of the event. What these psychological studies of time prove is that there can be inconsistency between what we perceive as flow and sequence of time on one hand and actual flow and sequence of time on the other. In other words, flow or sequence of time we comprehend is not intrinsic or the way actually time works, and we have no idea of what time is or whether there is such thing call time.

名色 (nama-rūpa) of time (flow and sequence of time) and of change are useful tools for us to simplify the complex affair of reality. But like any other concepts, they cause "the tyranny of tools". It prevent us from comprehending the world as it really is. It is therefore important to acknowledge that our understanding of time does not reflect the way the world really is.

5.1.2. Special relativity theory

The idea that time is 空 (śūnya) is not a too far-fetched idea thanks to Einstein's special theory of relativity, which is represented by the most well-known (but not necessary widely understood) equation $E = mc^2$. The relativity of time Einstein talked about is obviously different from the relativity of time Zen addresses. The former sees the relativity between time and the motion of object, whereas the latter regards relativity between what we perceive as time and function of mind or human values. Despite this difference, it is relevant for the purpose of this thesis to mention the special relativity theory. Since the purpose of the thesis is to demonstrate whatever we believe to know does not reflect the way the mind-independent reality (寂滅; nirvāna) actually is. The special relativity theory illustrates actual time is not something we assume it to be. In our ordinary life, we think of time as definite in the sense that it flow exactly the same way for everyone. Einstein's special theory of relativity contradicts this commonly held belief. According to the special relativity theory, the faster the object moves, the

slower time flows for the object, (i.e. flow of time is relative to the object's motion). The idea of a special theory of relativity was published by Einstein in 1905. The idea was developed to explain a bizarre implication of Maxwell's electromagnetic equation. What the equation entails is that electromagnetic waves including light travels at a fix speed regardless of the motion of the light source. Unbeknown to Einstein, empirical evidence for his special relativity theory had already been discovered by Michelson and Morley[5]. Albert Michelson and Edward Morley devised an experiment in order to measure the speed of the Earth, by observing how fast or slow light travels. The result of the experiment contradicted the prediction. Regardless of the direction of the apparatus, time of day or season, all results came out to be equal to *c*, the constant speed of light. In other words, light does not change its speed regardless of how fast and which direction the light source is moving. Lorentz and FitzGerald thought that the result of the Michelson-Morley experiment was due to the fact that the distance changes with speed (*Lorentz-FitzGerald contraction*). The reason the speed of light appears to be constant is because an object (in this case the apparatus) shrunk according to the speed it travels. Imagine an object which is moving with relative speed *v* to the observer. If the observer perceives the length of the object to be *x*, then the length of the object from its own perspective is x0.

[Eq.5.1.] Length contraction

$$x_0 = x \cdot \underbrace{\left(1 - \frac{v^2}{c^2}\right)^{-\frac{1}{2}}}_{\text{Lorentz factor}} = x \cdot \gamma$$

This theory explains the result of the Michelson-Morley experiment, but it does not explain anything other than that. Einstein's special relativity theory, on the other hand, not only explains the Michelson-Morley experiment, but is also compatible with Maxwell's electromagnetic equation. Einstein's theory, however, contradicts our common belief of time. Even nearly a hundred years after its publication, many people still assume the flow of time to be absolute. According to Einstein's special relativity theory, time flows differently relative to the

[5] Michelson, A.A. & Morley, E.W. (1887), "On the relative motion of the earth and the luminiferous ether", in *American Journal of Science*, vol.34, p.333-345.

movement of the observer, and there is no definite time. For two objects whose difference in speed is v, while object A experiences a certain length of time $\Delta t'$, and object B experiences a different length of time Δt. The difference of how the time flow for object A and B (known as *time dilation*) can be calculated using the Lorentz factor.

[Eq.5.2.] Time dilation

$$\Delta t' = \Delta t \left(1 - \frac{v^2}{c^2}\right)^{-\frac{1}{2}} = \Delta t \cdot \gamma$$

Lorentz factor

What Einstein discovered was not just a hypothesis; it has been proven by several experiments. A particle accelerator at CERN boosted particles called muons so close to the speed of light that their half life was stretched twenty times that of normal muons at rest. This happened because for the muons that travel close to the speed of light, time flow much slower than observers who are in rest. Similarly, using a device called an electron synchrotron in Daresbury Laboratory in Cheshire, it was discovered that wave length of electrons increase when they are travelling close to the speed of light (because for them time is flowing slowly).

There are two more important elements to Einstein's special theory of relativity. The first of the two is that not only time but mass of the object changes relative to its speed. If an object with rest mass of m_0 moves with the velocity v, then its mass changes to m. The resulting mass m can be calculated using the similar equation to the time dilation.

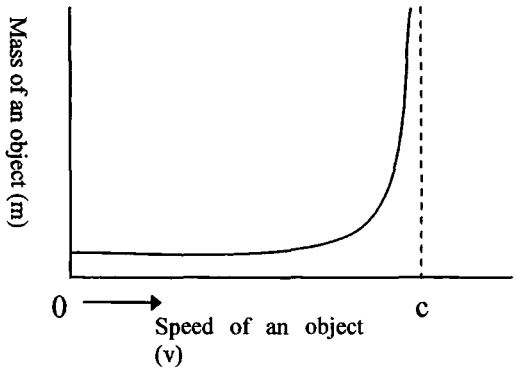
[Eq.5.3] Relativistic mass formula

$$m = m_0 \cdot \left(1 - \frac{v^2}{c^2}\right)^{-\frac{1}{2}} = m_0 \cdot \gamma$$

The implication of this formula is that anything moving close to the speed of light increases its mass to an infinite value (see Eq.5.4. and Fig. 5.1.). The moving object of infinite mass requires infinite energy, so no object with mass can reach the speed of light. In other words, nothing can exceed the constant speed of light c. This becomes important when we discuss the quantum entanglement later.

[Eq.5.4. & Fig 5.1.] If the object's velocity gets close to c

$$m = \lim_{v \to c} \left(m_0 \left(1 - \frac{v^2}{c^2} \right)^{-½} \right) = \infty$$



The other important element to Einstein's special relativity theory is that the stretch of time and shrinkage of distance postulated by Lorentz-Fitzgerald contraction are one and the same thing. According to Einstein, both the time and distance we measure are relative to the speed an observer or an object travels. Imagine an alien civilisation some 2 million light years away. In possession of a spaceship which can travel at almost the speed of light (at 0.999 999 999c). According to the equation of time dilation, for alien astronauts, it would only take 89.3 years to reach the earth.

[Eq.5.5] Space travel

$$\Delta t' = 2000000 \cdot \left(1 - \frac{(0.999999999c)^2}{c^2} \right)^{-½} = 89.3$$

The distance between points A and B is equal to the speed multiplied by the time it takes. For us, the distance between the alien planet and the earth is 1.89 x 10^{22}(m)[6]. For the alien astronauts, however, the distance between the two planets is only 8.34 x 10^{17} (m)[7]. How can the distance between the two planets vary so much? According to Einstein, since there is no absolute time or absolute rest, there is no absolute distance. This indicates that space (distance) as well as time is relative to the speed of the observer. This intimate relation between space (distance) and time contradicts our common perception. In everyday life, we conceive space and time to be distinct and mutually independent, but the theory of

[6] 299792458 (m/sec) x 31449600 (sec/yr) x 2000000 (yr)
[7] 299792455 (m/sec) x 31449600 (sec/yr) x 89.3(yr)

special relativity states that they are manifestations of one entity called space-time.

Psycho-physical experiments and Einstein's special relativity theory provide evidence that what we perceived as time is not necessary what the time actually is

5.2. Quantum physics and 空 (śūnyatā)

Quantum physics consists of three elements; quantum phenomena, quantum mechanics and quantum interpretation. The quantum phenomena are the observable facts of what occurs in the quantum world or what quantum effects have in observable events. What is unique about quantum phenomena is that they contradict with our common conception of reality or the laws of classical physics. Quantum phenomena are, however, tested under strict conditions, so that there is no room to deny that these strange phenomena exist. The second element, quantum mechanics is the result of formalising quantum phenomena. Formalisation is the process of analysing phenomena and finding an equation or a formula that is empirically adequate. Quantum mechanics is important because it gives us not only an ability to calculate and predict outcomes, but more importantly it states relations between different variables and clarify what those variables mean. The third element, quantum interpretation, is an interpretation of quantum mechanics which explains why the variables are related in certain ways or why certain mathematical formulae can explain or predict quantum phenomena. The quantum interpretation is the part of quantum physics relevant to metaphysics. Different quantum interpretations give different views on what the true nature of the reality is. In order to demonstrate 空 (śūnyatā) of space, substance and causation, I will carry out 帰謬論法 (prasange) against existing quantum interpretations that assumes our ideas of space, substance and causation actually reflect the way 寂滅 (nirvāna; the mind-independent reality) anyway is. The quantum interpretations I will look into are the Copenhagen interpretation, hidden variable theories (de Broglie's pilot wave theory and Bohm's quantum potential theory) and Evert-Deutsch's many-worlds interpretation.

Although the main focus of this section is 空 (śūnyatā) of space, I will look into quantum interpretations in terms of all space, time, substance and causation.

This is because these topics are interrelated and it is not possible to separate them. This chapter examine how these quantum interpretations deals with these topics. And later in Chapter Six and Seven, I will re-examine the implication of quantum physics on substance and causation. Because of this, the section 5.2. tends to be descriptive and not focused on 空 (śūnyatā) of space. I believe it is important to include this chapter since this establishes the framework on which the next two chapters are based. I defend the plausibility and impact of what I conclude in this chapter in Chapter Six and Seven. I also regret that I use many mathematical equations. To me an equations makes a brief and precise point.

5.2.1. Puzzling quantum phenomena and quantum mechanics

By the end of the 19th century, many believed that all major discoveries in science had been made, so that all that was left for science to study were the minor details. However those small details changed science completely, because classical physics could not explain what scientists thought to be minor and insignificant details. Those small details that did fit classical physics are known as quantum phenomena which gave birth to a new kind of physics called quantum physics. According to classical physics, quantum phenomena and mechanics are paradoxical or counter-intuitive (many texts uses the term "quantum paradoxes" to describe them). Reality, however, cannot be paradoxical. Paradoxes must lie within our understanding of the universe, not in reality. Classical physics was replaced by quantum physics because according to quantum mechanics what were known as quantum paradoxes for classical physics could no longer be seen as paradoxical (although currently available quantum interpretations are far from paradox-free).

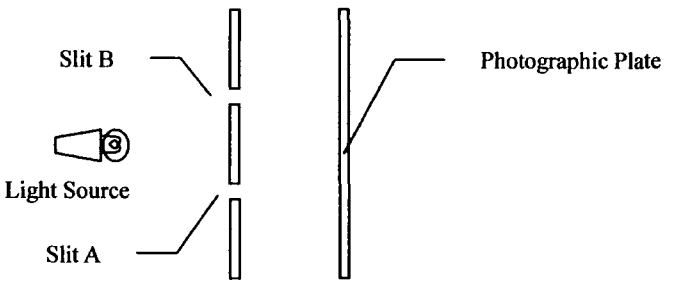
Regrettably, since there is not enough space to cover the entire field of quantum physics in this thesis, I can only mention three quantum phenomena and their related mechanics that are relevant to the purpose of this chapter. Other important discoveries in quantum physics, such as Bohr's model of atomic structure, QED (Quantum Electric Dynamics), the matrix description of wave function, super symmetry, super string theory and so forth, will have to be discarded. The three topics of quantum phenomena and their related mechanics

that this chapter looks into are 1) the wave/particle duality, 2) probability and uncertainty and 3) entanglement. In order to demonstrate the plausibility of its claim, any quantum interpretation must be able to accommodate the above quantum phenomena and quantum mechanics as its minimum requirement. If any interpretation fails to do so, then it is not worth examining its philosophical plausibility.

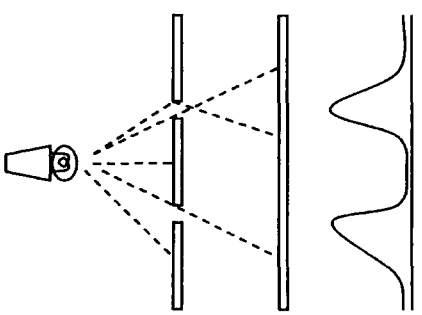
5.2.1.1 The wave/particle duality

One of puzzling phenomena that gave rise to quantum physics is the wave/particle duality of light. Scientists have known for a long time that light possesses both wave-like properties as well as particle-like properties. The problem is that nothing can be both wave and particle because their properties are mutually exclusive. This strange fact can be demonstrated by the so-called double-slit experiment. The original experiment was carried out by Young between 1797 to 1799 and was designed to prove light to be a wave and not a particle. The setting of the experiment was as followed;

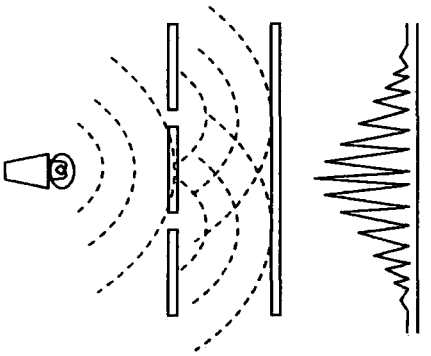
[Fig.5.2.a] Young's Double-Slit Experiment



[Fig.5.2.b.] If light is a stream of particles



[Fig.5.2.c.] If light is a wave

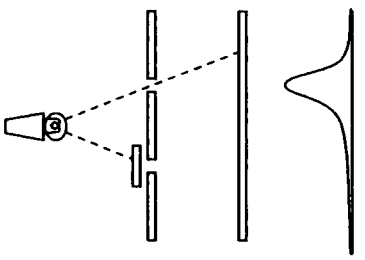


If light was a stream of particles like pebbles, then those that have gone though

the slit A would pile up behind the slit A, and those that have gone thought the slit B would pile up behind the slit B. If this were the case, pattern that emerges on the photographic plate would be the simple sum of two piles [Fig. 5.2.b]. Whereas if light were wave, then the pattern that appears on the photographic plate would be different. According to the law of superposition of waves, within the overlapping region where the two waves are in step, the intensity doubles (*constructive interference*) and where two waves are half a wavelength out of step, the waves cancel each other (*destructive interference*). As a result, light would create an interference pattern similar to two overlapping ripples [Fig.5.2.c]. When the experiment was carried out the result turned our to be the interference pattern of ripples, which suggested light was a wave and not a stream of particles.

With the development of technology, scientists can now carry out the double-slits experiment using a minute amount of light. When light was reduced to a minimum, light started to arrive at the photographic plate as a particle and not as a wave (i.e. instead of the interference pattern, a small dot appeared on where the light particle had landed). This particle nature of light was confirmed further by modifying the double-slits experiment. When the experiment was repeated with only one of two slits opened, impressions of light particles were concentrated behind the opened slit, like pebbles do. This indicated that light behave as a stream of particles.

[Fig.5.3] The single-slit experiment



A curious thing is that when both slits were opened, although light particles arrived at the photographic plate as particles, the light created the interference pattern of a wave. (i.e. rather than the photograph looking like one in Fig.5.2.b., the pattern was the same as one Fig.5.2.c).

This fact that the interference pattern appeared only when both slits were

open, suggests that light travelled as a wave and not as a particle (a single particle cannot pass through both slits, so that if light travelled as a particle, interference patter should not have appeared). At the same time if light were a wave, then it would not have appear on the photographic plate as a dot. What this implies is that light travels like a wave and not like a particle, yet it arrives at the photographic plate as a particle and not as wave.

The development of technology made the situation even worse. As de Broglie predicted in his essay[8], not only light, but also all matter display wave/particle duality. So far, similar double-slits experiments have been carried out using electrons, neutrons and even atoms, and all results confirmed the puzzling wave/particle duality. The wave/particle duality is demonstrated not only by the double-slits experiment but also by the ultra-violet catastrophe of *black body* radiation and photo-electric effects. Both indicate that electromagnetism demonstrates wave-like property, that its energy level is determined by its frequency but at the same time it possesses property of existing in a definite size like a particle (called a packet). Due to the lack of space in this thesis, I would like to omit both the ultra-violet catastrophe of *black body* radiation and photo-electric effects as evidences of the wave/particle duality of matter.

The wave/particle duality is related to the question of what kind or kinds of element or fundamental substance which everything is made out of. In history, there have been many theories about fundamental building blocks of the universe. Some ancient Greeks[9] and Indians[10] thought the universe was made out of four basic elements, earth, water, fire and air. Cartesian dualism thought there were two kinds of fundamental substance; material substance and mental substance. Many modern thinkers believe material substance to be the only fundamental substance. According to Zen, since everything we believe to exist is 空 (śūnya), these which we considered to be substance or fundamental elements should also be 空 (śūnya); they are products of human invention (有為; samskrta) and they do not

[8] de Broglie, L, (1925), "Recherches sur la théorie des quanta", *de l'Académie des Sciences* vol.177, p.630-632.

[9] Famously Empedocles of Acragas established classic theory of fundamental elements.

[10] Ajita Kesakambala, one of six influential *śramana* philosophers who existed at the time of Gautama Buddha. Others Indian philosophers of his time thought there may be additional three to five basic elements to exist.

exist in 寂滅 (nirvāna; the mind-independent reality). The wave/particle duality is important because it questions our belief in the material substance and suggests that material substance is 空 (śūnya). I will discuss this in the Chapter Six.

5.2.1.2. Quantum uncertainty

The second puzzling aspects of quantum physics is that at the quantum level, things seems to occur at random. This is radically different from the everyday world we experience. At the level of everyday objects, such as a car, a mug and a football, we can predict what will happen next if we know all the forces that causally influence the event. This is because at the level of everyday objects, under identical conditions, outcomes of the same action will always be the same. The car, the mug and the football do not suddenly change momentum or trajectory without any force applied to them. But at the quantum level, outcomes can vary even if the conditions and the cause remain identical. For example, the single- and the double-slits experiments illustrate that photons and electrons do not always appear on the same spot on the photographic plates, despite there being no apparent difference in the settings of the experiments. There are always certain spreads to where matters appear on the photographic plate. This spread can be mathematically described using a simple formula, known as the *probability density formula*, which is equal to the square of the absolute value of *Schrödinger's wave function*;

[Eq.5.6.] Schrödinger's wave function

$$\Psi(x.t) = A\cdot\sin(kx-\omega t) - i\cdot A\cdot\cos(kx-\omega t) = A\cdot e^{i(kx-\omega t)}$$

[Eq.5.7] The probability density formula

$$Prob(x.t) = |\Psi|^2$$

Since the wave function of the matter wave is complex, the square of Ψ is not $(A\cdot\sin(kx-\omega t) - i\cdot A\cdot\cos(kx-\omega t))^2$. For complex number (a–i·b), to make its square, it has to be multiplied by its *complex conjugate* (a+i·b). Therefore, the square of the wave function is;

$$|\Psi|^2 = (A\cdot\sin(kx-\omega t) - i\cdot A\cdot\cos(kx-\omega t)) \cdot (A\cdot\sin(kx-\omega t) + i\cdot A\cdot\cos(kx-\omega t))$$

What the formula describes is how likely the particle in question is to be found at

a certain location (x) at a certain time (t)[11]. The important thing to note here is that the equation does not give a precise location of the particle, it only gives the probability of where the particle is likely to be found. Reliablity of both the probability density formula and Schrödinger's wave function have been proven by their ability to explain and predict quantum phenomena. The most important thing to note in the formula is that it contains the *complex number i* ($i = \sqrt{-1}$). Since the wave function of the matter wave contains a complex number, the matter wave cannot be identified by its physical characteristics alone. Physically observable characteristics of a matter wave are the real part of the wave, and although the imaginary part of the wave influences the behavior of the matter wave, it is not physically observable.

Another aspect of the quantum world differing from the everyday world is the impossibility to measure location and momentum simultaneously. Heisenberg's uncertainty principle illustrated this.

[Eq.5.8.] Heisenberg's uncertainty principle

$$\Delta x \cdot \Delta p \geq \frac{\hbar}{2}$$

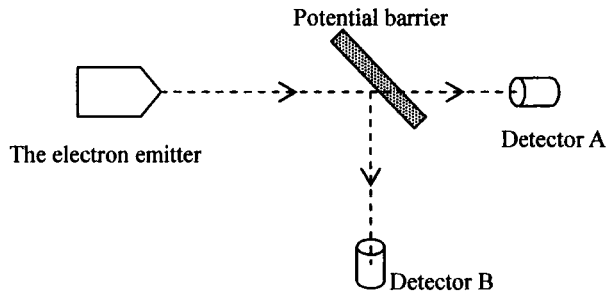
Because $\hbar$ is *Planck's constant*, and not a variable, the right-hand-side of the equation is constant. This means *standard deviations* for location (Δx) and momentum (Δp) are inverse proportion to each other. Standard deviation (Δ) is a measurement of the dispersion. If Δx is close to 0, then the size of the area where the particle is like to be found is significantly smaller. In other words, the smaller Δx the more precise our prediction of the location of a particle. In the same way Δp to be large indicates p can be any value within Δp. Because Δx and Δp are inverse proportion to each other, certainty concerning the location of a particle increase when certainty of momentum decreases, and vice versa.

Classical physics thinks everything has definite dynamic values, but Heisenberg's uncertainty principle suggest that quantum elements do not have

[11] For example, suppose two locations x1 and x2 on the photographic plate and different probability density; Prob(x1,t) = 0.01 (the probability of finding the particle at the location x1 is 1%) and Prob (x2,t) = 0.25 (the probability of finding the particle at the location x2 is 25%). Those probability densities tell us that it is 25 times more likely to find the particle on x2 than x1; yet, it is possible to find it at x1.

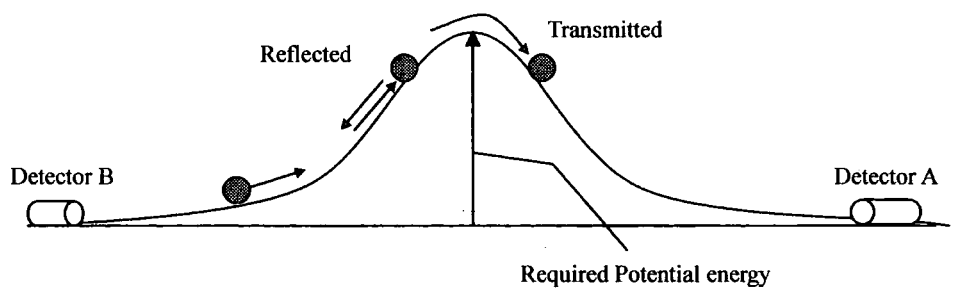
definite dynamic values, so that it exist everywhere and nowhere in particular and has no particular velocity and spin. This suggestion was proven by a quantum phenomena that is known as the *tunnelling effects*. Suppose the following set up of an experiment.

[Fig.5.4.] A setting to measure tunnelling effect



According to classical physics, if there is no other force, whether the particle is transmitted or deflected at the potential barrier is determined by the initial momentum of the particle. In order for the particle to pass the barrier (to be transmitted), the particle must possess sufficient energy. If the particle possesses sufficient energy, then it will be transmitted and it will be recorded on the detector A. Whereas if the initial momentum of the particle is not sufficient, the particle will be deflected and will be recorded by the detector B. The idea is easily illustrated with a simple potential barrier.

[Fig.5.5.] Potential barrier



The ball will be transmitted or reflected by the hill according to whether initial velocity is less or greater than the critical value. The result of the tunnelling experiment, however, contradicted the prediction made by classical physics.

Sometimes, even when the initial momentum of the particle was not sufficient to pass through the barrier, the detector A recorded the particle. Other times, even thought the particle possessed sufficient energy, the detector B indicated that the particle has been deflected. The result of the experiment illustrated that at the quantum level, things seems to happen at random and violate classical physics that assumes the deterministic nature of reality. Classical physics assumes two things regarding causation. The first is the idea that nothing happen without a cause. Normally we assume everything that occur has a cause or causes to why that happens. The second is the deterministic nature of causation. Classical physics believes that under the identical circumstance, the identical causes always result in the identical outcome. For example, if we repeat an experiment under an identical circumstance, the result will always be the same. All the tunnelling effect, quantum mechanics of probability density formula and Heisenberg's uncertainty principle suggest causal determinism to be 空 (śūnyatā). They imply traditional ideas of causation and determinism to be 有為 (samskrta) and not derives from the way the mind-independent reality actually is. The causations and determinism are 名色 s (nama-rūpas) as tools that enable us to assume regularity in order to give us some degree of certainty. These regularities we assume to exist in the world are useful but some time lead us to false prediction and false expectation. I will come back to 空 (śūnyatā) of causation in the Chapter Seven.

5.2.1.3. Quantum entanglement

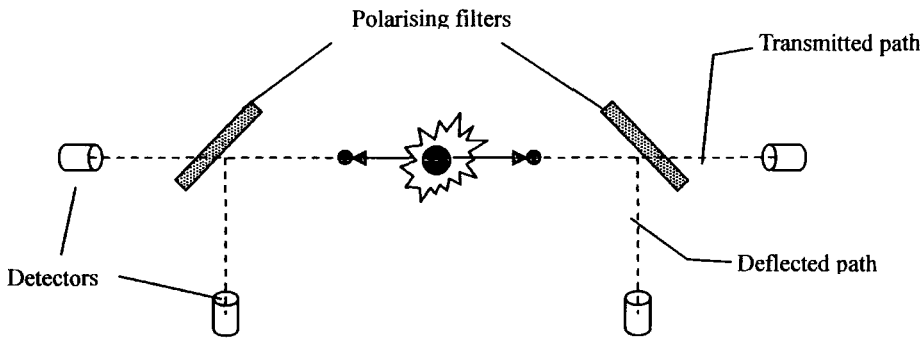
The whole topic of entanglement has its origin in the so-called *EPR thought experiment*[12]. The thought experiment was invented to demonstrate how Heisenberg's uncertainty principle violates relativistic mass formula of the Einstein's special relativity theory[13], thereby false. Suppose explosion of a molecule made up by two identical particles, Particle L and R. The particle-L flies off to the left and the particle-R to the right. Because the two particles are identical in every way except their direction of traveling, we can calculate the

[12] The name EPR came from names of its inventors *E*instein, *P*odolsky and *R*osen. In Einstein, Podolsky, Rosen (1935), "Can quantum-mechanical description of physical reality be considered complete?", in *Physical Review*, Vol.47, pp.777-780.
[13] See E.q. 5.4 in section 5.1.2

speed of L by measuring R, and understand the momentum of R by measuring L. But according to the Heisenberg's uncertainty principle, even under such conditions we cannot measure the location and momentum simultaneously. This implies that measuring one of them instantaneously affects the other regardless of the distance between the two. Einstein, Podolsky and Rosen thought Heisenberg's uncertainty principle is wrong because the instantaneous communication violates the mass formula of the special relativity theory [E.q.5.4. in section 5.1.2]. As we saw in section 5.1.2, according to the mass formula of the special relativity theory, nothing can exceed the speed of light, because reaching the speed of light requires an infinite amount of energy.

In this thesis, in order to understand the EPR experiment and what the result of such experiment suggests, I use a simplified version of EPR-B[14].

[Fig.5.6.] EPR-B using polarisation of entangle photons



In the experiment, the probability of the particle to take a transmitted path or a deflected path is determined by the angle of the polarised filter and spin of the particle. The probability of the particle to be transmitted can be calculated using a simple formula,

[Eq.5.9.]

$$\text{Prob}(\theta) = \cos^2\theta$$

where θ is the angle of the filter.

To make the matter simpler, let us assume that there are only three possible angles

[14] This is a version of EPR thought experiment which measure spin (rotation) and location rather than speed and location. This version was developed by Bell, J.S. (1964), "On Einstein-Podolsky-Rosen paradox", in *Physics*, Vol.1, p.195-200, reprinted in his (1987), *Speakable and Unspeakable in Quantum Physics*, (Cambrisdge; Cambridge Univ. Press), p.14-21.

of the filters; 0°, 30° and 60°. Then transmitted rates of particle in each angle are calculated as;

[Table.5.1.]

0°;	$\cos^2 0°$ = 1	(100%)	Every photon passes the filter
30°;	$\cos^2 30°$ = 3/4	(75%)	Only three out of four photons pass the filter
60°;	$\cos^2 60°$ = 1/4	(25%)	Only one out of four photons pass the filter

Using two filters and particles with the same spin direction (it is normally the opposite directions, but to make the matter simple, I would like to assume the same direction) we can have nine possible outcomes. According to physics of an ordinary object, the rate of co-ordination between particles going to the right filter (R) and those going to the left filter (L) can be calculated according to simple mathematics;

[Eq. 5.10] Prediction by classic physics

Rate of co-ordination

= (rate of both pass) + (rate of both deflected)

= (pass rate of R) x (pass rate of L) + (deflected rate of R) x (deflected rate of L)

$= \cos^2\theta R \times \cos^2\theta L + (1 - \cos^2\theta R) \times (1 - \cos^2\theta L)$

When the experiment was actually carried out by Aspect et al[15], the result contradicted the above prediction and proved Heisenberg's uncertainty principle to be correct. More importantly the result indicated violation of the special relativity theory. In other words, it demonstrated the instant communication between L and R.

[15] Aspect, A., Grangier, P. & Roger, G. (1982), "Experimental realization of Einstein-Podolsky-Rosen Gedankenexperiment: A new violation of Bell's inequalities", in *Physical Review Letters*, vol.48, p.91-94.

[Table.5.2.] The quantum entanglement in EPR-B experiment

The angle of RHD filter	The angle of LHD filter	Classical Physics expects			Aspect's result	
		Pass rate of R	Pass rate of L	Coordination rate	Difference of two filters	Coordination rate
θR	θL	$\cos^2\theta$R	$\cos^2\theta$L	eq….	α	$\cos^2\alpha$
0°	0°	4/4	4/4	16/16	0°	16/16
0°	30°	4/4	3/4	12/16	30°	12/16
0°	60°	4/4	1/4	4/16	60°	4/16
30°	0°	3/4	4/4	12/16	30°	12/16
30°	30°	3/4	3/4	10/16	0°	16/16
30°	60°	3/4	1/4	6/16	30°	12/16
60°	0°	1/4	4/4	4/16	60°	4/16
60°	30°	1/4	3/4	6/16	30°	12/16
60°	60°	1/4	1/4	10/16	0°	16/16
Total co-ordination				10/18		13/18

The table shows that the rate of co-ordination classical physics expects (10/18 or 55.56%) and the result of Aspect's experiment (13/18 or 72.22%) do not match. The result of Aspect's experiment indicated that the co-ordination rate was higher than classical physics expected. Furthermore, surprisingly, the co-ordination rate was exactly $\cos^2\alpha$, where α is the difference in angles of two filters ($\alpha = |\theta R - \theta L|$). What the result of Aspect's experiment suggested is that the pass rate of particles L and R are related; somehow the pass rate of the right hand side was altered by the pass rate of the left hand side, and vice versa. According to Einstein's special relativity theory, it is not possible for particle L and R to simultaneously alter each other while they are apart. Contrary to Einstein's theory, the experiment proved that Heisenberg's was right and Einstein, Podolsky and Rosen were wrong. There is instantaneous communication between two particles which violates the special relativity theory.

The instantaneous communication of the quantum entanglement can suggest three-dimensional space to be 空 (śūnya), because the entangled particles behave as if there is no distance between them. We assume distance and three-dimensional extension to be intrinsic to 寂滅 (nirvāna), but they could be 空 (śūnya). I will defend this idea using 帰謬論法 (prasamga), by demonstrating how theories that assume 寂滅 (nirvāna) to be three-dimensionally lead to undesirable and implausible conclusion.

5.2.2. Quantum interpretations compared

Although historically, de Broglie's pilot wave theory came first, it is easier to start with the Copenhagen interpretation, since it was (and perhaps still is?) the most influential interpretation and I can present other interpretations in comparison to the Copenhagen interpretation. The other reason to put the Copenhagen interpretation first is to give fair treatment towards hidden variable theories and the many-worlds interpretations. Non-Copenhagen interpretations have suffered unfair dismissals, in favour of the Copenhagen interpretation[16]. By arguing against the Copenhagen interpretation first, it is easier for other interpretations to enjoy fair treatment.

Above quantum interpretations assume not necessary all but some of what we perceived as space, time, fundamental substance and causation to be intrinsic to the mind-independent reality (寂滅; nirvāna). In order to prove them to be 空 (śūnya), I carry out 帰謬論法 (prasanga) upon the above quantum interpretations. As I stated in Chapter Two, 帰謬論法 (prasanga) examines the plausibility of an idea or theory in terms of 1) compatibility with facts, 2) philosophical plausibility and 3) economy. In the context of quantum physics, the first criteria means compatibility with quantum phenomena and quantum mechanics, in order to be true description of the reality, any theory has to be able to at least explain puzzling quantum phenomena and mechanics mentioned above.

As I stated at the beginning of this chapter, since it is not possible to deal with topics of space, time, substance and causation separately, I will examine these quantum interpretation in terms of all space, time, substance and causation.

5.2.2.1. The Copenhagen interpretation

The Copenhagen interpretation still remains the most influential interpretation

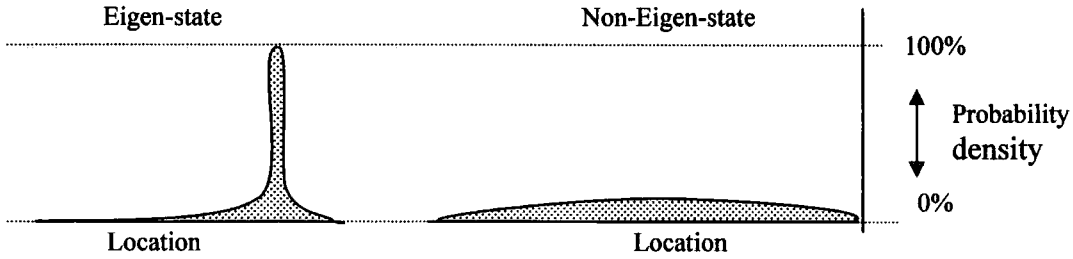
[16] Hostile attitudes towards non-Copenhagen interpretations can be found in many literatures. To give few examples, Heisenberg (1958), *Physics and Philosophy: The Revolution in Modern Science*, (N.Y.; Harper and Row), p.129-130, / Margenau Hendry (1964), "Measurements and Quantum states; part I", in *Philosophy of Science*, vol.30, p.7, / Rosenfeld Leon (1961), "Foundations of quantum theory and complementarity", in *Nature*, vol.190, p.384. / Hanson, Norwood. (1963), *The Concept of the Positron*, (Cambridge; Cambridge Univ. Press).
Omnès, R. wrote "there is no serious alternative to it (the Copenhagen interpretation), since the approach through hidden variables, whatever its interest, has not been developed to the point of giving a theory but only the preliminaries of a theory", in his (1992), "Consistent interpretations of quantum mechanics", in *Reviews of Modern Physics*, vol.63, p.340.

of quantum physics, despite its problematic philosophical implications. It is difficult to explain precisely what the Copenhagen interpretation is. This is due to the fact that the term "Copenhagen interpretation" covers many diverse and often conflicting quantum interpretations. Even the pioneers of the theory, such as Bohr, Heisenberg and Pauli, all held significantly different views. Moreover the interpretations of von Neumann and of Wingner are radically different to these of the above key figures. Unfortunately, there is not enough space to explore these various Copenhagen interpretations in depth. Instead I discuss what I believe to be the most widely accepted form of Copenhagen interpretation which is a compilation of the best parts from different versions of Copenhagen interpretations, and not by one particular person.

The Copenhagen interpretation is the literal interpretation of quantum mechanics. It believes Schrödinger's wave function, probability density formula, the uncertainty principle to be a true and complete descriptions of matter. This means matter normally exist as wave of probability and has no definite dynamic values such as location, momentum, spin and so forth (this is because E.q.5.6. contain the complex number i ($i = \sqrt{-1}$)). But this does not explain the wave/particle duality. In order to accommodate the duality, the Copenhagen interpretation employs an idea called "the collapse of wave function". It argues that a matter normally exists as a probability wave which does not have definite dynamic values, but it turns into a particle when its momentum or location is measured (in quantum physics the act of measuring is referred to as "observing"). In other words, the observation forces the probability wave to collapse and turn it into a particle that possesses definite dynamic values. In the terminology of quantum physics, the matter can be in two distinct states; *eigen state* where the matter is a particle and *non-eigen* state where it is the probability wave.

According to the probability density formula, when matter is in a non-eigen state, the probability density spread, so that everywhere possess more than 0 (0%) less than 1 (100%) of finding a matter, yet no particular location has probability density equal to 1 (100%). On the contrary, when the matter is in an eigen state, the probability on a particular location turns into 1 (100%), and probability of finding the matter elsewhere turns into 0 (0%).

[Fig.5.7] The collapse of the wave function



According to the collapse of wave function, in the double-slit experiment, the light changes its state three times. At the light source, the light was a particle, it had definite location and momentum. As soon as the light left the light source, it turned into the probability wave. Because the light traveled as the probability wave which exist everywhere and nowhere in particular, it can travel through both slits and cause interference pattern. The light turns from the probability wave to a particle again when it hit the photographic plate, thus a single dot appears on the location where the matter turned into a particle. In the same manner the tunneling effects can be explained using the collapse of a wave function. As soon as the electron left the emitter, it turned into a probability wave which spread out and has no definite dynamic value. Because the probability for finding the electron spread everywhere even behind the potential barrier, it could appear on the other side of the barrier despite the electron did not have sufficient momentum. Although the Copenhagen interpretation does not explain exactly how that happens, it is at least compatible with the quantum entanglement. The distance exists because we assume that particle L and R remained and travelled as particles. If the particles turned into probability waves, their existence overlapped because as probability waves their existence spread everywhere. In other words, as probability waves there is no distance between them.

Although the Copenhagen interpretation is mathematically satisfactory, there are problems regarding the collapse of the wave function, the idea of observation forces a matter to change from a probability wave to a particle. Problems of the collapse of the wave function can be divided into two kinds. The first kind is about the distinction between the object that goes into a non-eigen state when it is not observed and the object that stays in an eigen state regardless of whether it is

observed or not. The second kind is the distinction between the observer who is capable of collapsing wave function and one who is not. The first problem is illustrated by the famous thought experiment known as "Schrödinger's Cat".

> A Cat is penned up in a steel chamber, along with the following diabolical device (which must be secured against direct interference by the cat); in a Geiger counter there is a tiny amount of radioactive substance, *so* small, that *perhaps* in the course of one hour one of the atoms decays, but also, with equal probability, perhaps none; if it happens, the counter tube discharges and through a relay releases a hammer which shatters a small flask of hydrocyanic acid. If one has left this entire system to itself for an hour, one would say that the cat is still alive *if* meanwhile no atom has decayed. The first atomic decay would have poisoned it. The ψ-function of the entire system would express this by having in it the living and the dead cat (pardon the expression) mixed or smeared out in equal parts[17].

The first paradox Schrödinger's Cat thought experiment illustrates is that the Copenhagen interpretation implies "the cat is neither dead nor alive (or dead and alive at the same time) unless it is observed". But surely the cat must be either dead or alive regardless of whether it is observed or not, and it cannot be in some strange suspended state of neither dead nor alive. Not only the cat, but everyday objects around us continue to exist and continue to have definite positions and momentum regardless of whether or not they are observed. Suppose I left a cup of tea on a dinning table and went into a kitchen to get some milk. Even when I am in a kitchen and not observing the cup, the cup does not turn into a probability wave, as the Copenhagen interpretation suggests. In order to combine the fact that the cup does not go into non-eigen state when it is not observed and quantum phenomena that quantum particle turns into non-eigen state when it is not

[17] Schrödinger, E. (1935), "Die gegenwärtige situation in der quantenmechanik", in *Naturwissenschaften* Vol.23. Translated and Reprinted as "The present situation in Quantum Mechanics" in Wheeler, J. A. & Zurek, W. H. (eds.), (1983), *Quantum Theory and Measurement*, (Princeton; Princeton Univ. Press), p.152-67

observed, the Copenhagen interpretation has to make the distinction between an object that goes into non-eigen state when it is not observed and an object that has definite dynamical values regardless of whether or not it is observed. Such a distinction normally coincides with a distinction between microscopic and macroscopic objects. There are two problems in this line of argument. Firstly it is difficult to imagine that there is a clear boundary between microscopic and macroscopic. But more serious, the second problem is the paradox that somehow, microscopic elements go into non-eigen state without making a macroscopic object they compose to be in non-eigen state. All macroscopic objects are made out of microscopic objects. For example, the cat is made out of microscopic objects (electrons and neutrons). If those electrons and neutrons that compose the cat go into non-eigen state when they are not observed, then the cat as a whole should also goes into the non-eigen state (not having a localised position, i.e. cat that exists everywhere but nowhere). However, the fact, that the cat does not go into a non-eigen state even when it is not observed, goes against the Copenhagen interpretation.

The second distinction problems for the Copenhagen interpretation can be illustrated using the tunnelling effect. In the experiment, polarising filters alter the wave function without collapsing the wave function of the electron. Whereas, when the electron interacts with the detector, the detector collapses the wave function rather than altering the wave function. What is the difference between the filters and the detector? Why does only the detector collapse wave function and not the filter? The Copenhagen interpretation normally identifies the distinction with an another distinction which is between an object that is capable of possessing consciousness and an object that is not. It argues that only observation by a conscious observer can collapse a wave function. This leads to the age old problem which philosophy and psychology have been trying to solve for many years without any success. The problem is finding a distinction between objects capable of possessing consciousness and objects that are not. The Copenhagen interpretation has to prove that there is a metaphysical or physical difference between the two. Let us reconsider Schrödinger's Cat. Common sense tells us that surely the cat must be aware of its own state. If the cat can be aware of its own

state, then does this not qualify the cat to be a conscious observer? Suppose further, if we replace the cat with a chimpanzee, a fish, a bird, an insect, a plankton, a bacteria, can they be qualified as conscious observers that are capable of collapsing the wave function? Where in the hierarchy of organic beings lies the boundary between conscious and non-conscious? I will discuss this point in the next chapter (section.6.2.2.).

The Copenhagen interpretation suggests what is called *complementarity* that the matter is either in eigen state or non-eigen state, and matter cannot be both the provability wave and a particle at the same time. This derives from the idea that in order for a matter to be a particle and to have definite dynamic values, the probability wave has to collapse. Dipankar Home[18] proposed an experiment to challenge this claim. If a gap between two prisms were narrower than the wavelength of the incoming light, between the gap, the light behaves both as a wave and as a particle at the same time. The experiment was carried out by Mizobuchi and Ohtake of Hamamatsu Photonics, and the result proven the Home's prediction to be correct. This obviously denies the *complementarity* which the Copenhagen implies.

There is also the problem of non-eigen state. The Copenhagen interpretation suggests that matter normally exists in a non-eigen state unless it is observed. This seems to go against our common view of reality. Bell stated that;

> One wants to be able to take a realistic view of the world, to talk about the world as if it is really there, even when it is not being observed. I certainly believe in a world that was here before me, and will be here after me, and I believe that you are part of it! And I believe that most physicists take this point of view when they are being pushed into a corner by philosophers.[19]

Similarly Pagel describes that the Copenhagen interpretation forces us to accept

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[18] Home, Dipankar, (1992), "Optical tunnelling of single photon state: Wave-particle complementarity revised". Talk given at the 4th International Symposium of the Foundation of Quantum Mechanics in the Light of New Technology, Tokyo; 23-27th August 1992.

[19] From John Bell's interview by BBC Radio 3, printed in Davis P. and Brown J.R.(eds.) (1986), *The Ghost in the Atom*, (Cambridge; Cambridge Univ. Press), p.50

that "the electron seems to spring into existence as a real object[20]" when it is observed by a conscious being. Philosophers and many physicists find the conscious observer claim of the Copenhagen interpretation to be too problematic.

The fifth and the final objection accuses the whole Copenhagen interpretation of being an ad hoc argument. The whole Copenhagen interpretation is an attempt to legitimise the wave description of matter. Since the Copenhagen interpretation takes the wave description of matter to be a true and complete description, it has to introduce the idea that there are two possible states of matter. In order to defend this dual state of matter, the Copenhagen interpretation introduced "collapse of the wave function". To defend the collapse of the wave function, the interpretation introduced the special role of a conscious observer. To me, the entire argument of the Copenhagen interpretation consists of ad hoc arguments in order to defend its belief that the wave function is the true and complete description of matter.

Regarding 帰謬論法 (prasanga), the Copenhagen interpretation scores relatively high on the first criterion, the compatibility with facts. But the interpretation must score high since it is a literal interpretation of quantum mechanics. The interpretation fails to satisfy the other two criteria, namely philosophical plausibility and the economy of quantum interpretation. The interpretation contains too many philosophically questionable ideas such as the collapse of wave function, the existence of the animate/inanimate distinction and the existence of microscopic/macroscopic distinction. Introducing above ideas is bad for the economy of theory as well. These ideas are all ad hoc ideas introduced to make literal interpretation of quantum mechanics philosophically plausible. These forces to conclude that the Copenhagen interpretation is not plausible interpretation.

5.2.2.2. Hidden variable theories

Hidden variable theories oppose two core concepts of the Copenhagen interpretation, namely; 1) the collapse of wave function and 2) the indeterminate nature of reality. Hidden variable theories think that matter does not go into a non-eigen state even when it is not observed. In this sense hidden variable theories

[20] Pagels, Heinz (1982), *The Cosmic Code*, (London; Michael Joseph), p.144.

have advantages over the Copenhagen interpretation. Because hidden variable theories do not postulate the collapse of wave function, many problems the Copenhagen interpretation faces disappear. Concerning the indeterminacy, hidden variable theories supposes the source of the uncertainty to be our epistemological limitation rather than the way quantum phenomena work. The reason we can only know things in terms of probability is that there is/are factor or factors which influence the behaviour of matter, but which we do not know of, thus the name hidden variable.

Hidden variable theories were not well received nor well discussed. This was, I believe, due to objections based on sentimentality rather than rationality. Hidden variable theories were accused of being too conservative or a backward step towards the determinism of classical physics. The biggest obstacle faced by hidden variable theories, however, was the apparent proof by von Neumann[21], which supposedly proved that mathematically any form of hidden variable theory is incompatible with known quantum mechanics. Although in 1935 Grete Hermann pointed out a certain flaw in the proof, his argument was ignored by the science community. It took another 31 years to disprove the seemingly solid von Neumann objection against hidden variable theories. Bell who showed that von Neumann's objection was based upon false assumption stated in the interview that;

> When you translate [his assumptions] into terms of physical disposition, they are nonsense. You may quote me on that; The proof of von Neumann is not merely false but foolish![22]

So now, we can look at different hidden variable theories without any negative prejudice. In this paper, I will mention two of the many hidden variable theories; the de Broglie pilot wave theory, and Bohm's quantum potential interpretation.

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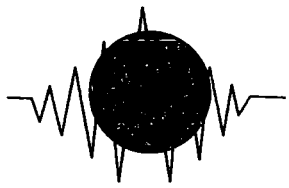
[21] von Neumann J. (1932) *Mathematische Grundlagen der Quantenmechnik*, Berlin; Springer, the English translation (1955) *Mathematical Foundations of Quantum Mechanics*, (Princeton; Princeton Univ. Press).

[22] Interview in the American science magazine *Omni*, 1988, May, p.88

5.2.2.2.1.The de Broglie's pilot wave theory

The most interesting thing about de Broglie's concept[23] is that, unlike the classical idea of matter being *either* a particle *or* a wave, he argues that matter consists of a wave part *and* a particle part. This idea is known as *the principle of the double solution*, which successfully combines the wave nature and the particle nature of matter without any contradiction. According to de Broglie, a matter wave, which the wave function describes, is something that accompanies a particle, and one cannot have a particle without its associated wave, nor a matter wave without the particle.

[Fig.5.8.] particle with extended wave part



According to the pilot wave theory, the particle part of matter always has a definite trajectory, and that trajectory is determined by the extended wave part of the matter, which senses the environment and guides the particle part accordingly (hence the term "pilot wave"). For example the behavior of the matter in the double-slits experiment can be explained as follows; even though the particle part goes through only one of the slits, its wave part senses whether the other slit is open or closed. If the wave part senses the other slit to be open, it guides the particle part to a certain location on the photographic plate according to wave's interference pattern, as section 5.2.1.1 illustrated. Whereas if the wave part senses the other slit to be closed, it pilots the particle part to create non-interference pattern. Because the wave part of the matter decides the trajectory and where on the photographic plate the particle should land, it appears that the particle travels as a wave.

There are several objections to de Broglie's pilot wave theory, but in this thesis, I mention just two, which are criticisms relevant to the development of

[23] de Broglie, L, (1925), "Recherches sur la théorie des qunata", in *de l'Académie des Science*, Vol. 177, p.630-632.

Bohm's hidden variable theory. The first of the two is a criticism raised by Pauli. Pauli showed mathematical flow in de Broglie's theory. The theory fails to provide definite dynamic values, even though the fundamental idea of the theory claims matter always has dynamical values. The second problem with de Broglie's pilot wave theory is its difficulty to explain the quantum entanglement. This non-locality problem of de Broglie's pilot wave theory was illustrated by the Gleason theorem [24] and a more specific case of the problem by the Kochen-Specker theorem[25]. The problem can be illustrated as follows; In order for the pilot wave theory to accommodate the entanglement, the pilot wave has to travel faster than the speed of light. De Broglie's pilot wave theory cannot accommodate the pilot wave to be faster than the speed of light since the theory portraits a pilot wave as a real three dimensional wave.

5.2.2.2.2. Bohm's quantum potential theory

Responding to criticisms faced by the pilot wave theory, Bohm introduced a new version of hidden variable theory[26]. The most obvious difference between de Broglie's pilot wave theory and Bohm's quantum potential theory is that de Broglie treated a pilot wave as a real wave, whereas for Bohm, what the wave function described was not an actual wave but a *quantum potential field* which influences the behaviour of a particle. The idea can be easily illustrated by using simple hydro-dynamics. If there are areas of higher water pressure and of lower water pressure, the difference in water pressure moves water molecules from the area of higher pressure to the area of lower pressure, until it reaches equilibrium. In the same manner, particles move according to differences in quantum potential, moving from an area of higher quantum potential to an area of lower quantum potential. This is a very important difference between de Broglie's pilot theory and Bohm's quantum potential theory. As the hidden variable is not a wave part of matter but a field within which matter exists, it does not have to travel at all. In

[24] Gleason, A.M. (1957), "Measurement on the closed subspaces of a Hilbert space", in *Journal of Mathematics and Mechanics*, vol.6, p.885-893.
[25] Kochen S & Specker, E.P. (1967), "The problem of hidden variables in quantum mechanics", in *Journal of Mathematics and Mechanics*, vol.17, p.59-87.
[26] Bohm, David. (1952), "A suggested interpretation of quantum theory in terms of "hidden variables" Parts I and II, in *Physics Review*, vol.85, p.166-179 & p.180-193.

this way Bohm's theory overcomes the entanglement problems postulated by the Gleason theorem and the Kochen-Specker theorem. Another important difference between de Broglie's pilot wave and Bohm's hidden variable theory is that Bohm's quantum potential field exists in (3·n dimensional) *configuration space*[27]. As we saw earlier, de Broglie's pilot wave exists in three dimensional space, which creates a problem regarding compatibility with Schrödinger's wave function of more than two particles. According to the wave function, the behaviour of two entangled particles have to be calculated in a six dimensional configuration space. This also explains the quantum uncertainty. Since ordinary objects contain billions and trillions of subatomic particles, it is impossible to comprehend behaviour of ordinary objects. For example, since a simple pen contains an astronomical amount of particles, in order to comprehend or predict the behaviour of the pen, we have to consider almost infinite dimensional configuration space.

This idea of non-locality of quantum potential leads Bohm to take a holistic view of the universe. The theory explains the entanglement in terms of a particle changing quantum potential of even the far side of the universe. If this is true, then it also has to be true that whatever is happening on the other side of the universe influences the behaviour of quantum particles here on the earth. This implies a web of interaction between every particle in the universe (a change of any particle is felt by every particle in the universe). The idea of holism has its fair share of criticisms, but Bohm's holism has a particular twist which it makes much harder to accept. Because of the quantum entanglement, this web of interaction has to be instantaneous, regardless of the distance. If Bohm's holism is correct, something happening here on earth instantaneously influences the behaviour of a particle on the other side of the universe. This problem of Bohm's holism is often described as a particular version of so-called "butterfly effect". The butterfly effect is the idea that although insignificant, theoretically a flap of a butterfly in Thailand can have causal effects upon the emergence of a storm in the Caribbean. Bohm's quantum potential theory implies that not only a flap of butterfly

[27] For Bohm, like Schrödinger, if there are n number of particles in an equation, then the equation must be taken as a description of $3 \cdot n$ dimensional space. For example, if there are two particles in question, then there will be 6-dimensions (n=2).

influences the weather ten thousand miles away but also the influence is instantaneous.

The second and most common criticism against hidden variable theory accuses the theory of being an ad hoc argument, a desperate attempt to save classic causal determinism. The whole point of hidden variable theories is to enable classic physics to explain quantum phenomena which appears to contradict classic physics. Historically the only argument that supported causal determinism was a success of Newtonian physics. Before Newton, some people believed in determinism but it was based on fatalism derived from religious belief and not any scientific evidence. When the behaviour of quantum mechanics proved Newtonian mechanics to be false, there was no reason other than sentimentality to hold onto causal determinism. I will come back to this point in Chapter Six which discusses the emptiness of physical causation.

Regarding three criteria of judging the plausibility of quantum interpretation, Bohm's hidden variable theory explains the wave/particle duality, but struggles to explain exact mechanism of the tunnelling effects and the quantum entanglement, because it assumes a matter to be a particle. In terms of philosophical plausibility, it has an advantage over the Copenhagen interpretation, because it does not require the collapse of wave function. But it implies a particular version of holism which is hard to accept. The theory suggests that everything in the universe not only is causally related, but also the causation is instantaneous regardless of where two things or events are located. The hidden variable theories seems to be ad hoc to the belief in the deterministic picture of reality, that nothing happen without cause and things do not happen at random. It seems quantum potential theories were sentimental attempts to combine quantum mechanics with causal determinism of classical physics.

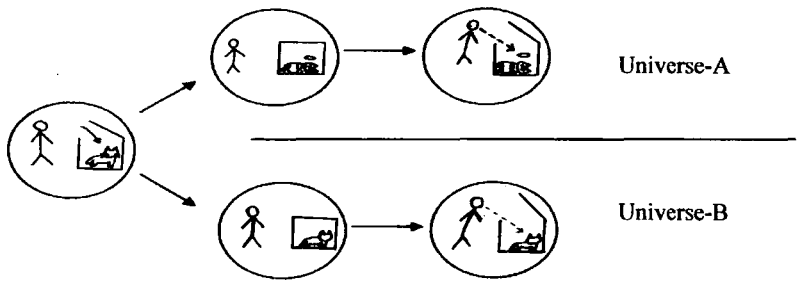
5.2.2.3. The many-worlds interpretation

The so-called many-worlds interpretation was originally proposed by Everett[28] in 1957. Like hidden variable theories, the many-worlds interpretation denies non-eigen state and the collapse of wave function. However, unlike hidden

[28] Everett, H. (1957), '"Relative State" Formulation of Quantum Mechanics' in *Review of Modern Physics*, Vol.24, p.454-462.

variable theories, it denies causal determinism. As Heisenberg's uncertainty principle and the probability density formula illustrated, mathematically there is no reason for one particular possibility to materialise. The theory therefore argues that all the possible outcomes that wave function describes must also exist or coexist. The question then is why do we see only one particular outcome and not see other possible outcomes? In the tunnelling effect, the electron is either transmitted or reflected, so that the electron is recorded by only one of two detectors, but not by both detectors. Everett (and later De Witt and Graham[29]) proposed that the reason we do not see all those possible outcomes is because each possible outcome belongs to different branched out universes. Concerning Schrödinger's cat thought experiment, when the box that contain the cat and the diabolical device is closed, the universe splits into two copies, one contains a live cat and the other a dead cat. Both copies contain the same observer, too.

[Fig.5.9.] Schrödinger's cat and the many-worlds interpretation



For the observer in universe B, the cat is alive all the time even before he opens the box, whereas for the observer in universe A, the cat is dead. The reason the observer in universe B does not see the dead cat is because he just happens to be in universe B. What the probability density of the wave function represents is the probability for the observer to be in a particular branched out universe. There are advantages for regarding the uncertainty principle and the probability density in this way, because the theory does not require any supplemental metaphysical claim. It can accept quantum mechanics as a complete description of quantum phenomena. Mathematically it is elegant, in the sense that it has no inconsistency

[29] De Witt, B. S. & Graham, N. (1973), *The Many-Worlds Interpretation of Quantum Mechanics*, (Princeton; Princeton Univ. Press).

with empirical evidence displayed by quantum phenomena.

There are three kinds of criticism against the many-worlds interpretation. The first is neither philosophical nor scientific. It is what Squires[30] described as "the uneasiness" of introducing an infinite number of coexisting universes. The many-worlds theory is accused of introducing unnecessary elements into explanation. According to the many-worlds interpretation, the numbers of parallel universes is equal to every possible outcome of every quantum effect. Physicists and philosophers admit that introducing an infinite number of parallel universes is metaphysically less controversial than defending determinism or giving a special role to the conscious observer, since it does not require supplemental claims. However, the existence of infinite parallel universes is too controversial and too radical for many people, since in order to explain even simple phenomena, we have to think about infinite numbers of worlds that influences the very world we are in.

The second problem of the many-worlds interpretation is that it does not explain how and what makes a world split or fuse. The theory argues that every time there are two or more possible outcomes, the world splits to accommodate all possible outcomes. But does this mean the existence of multiple possibilities makes the world split into whatever number of possible outcomes there are? If so, what sort of special force does the existence of multiple possibilities hold in order to make a whole universe split? Moreover, what makes the universes fuse? If, in the double-slits experiment, the photographic plate is placed too close to the screen, the interference pattern does not appear, because two possible paths are not allowed to overlap. The interference pattern emerges only when two possible paths are allowed to overlap. Does this mean the set up of the experiment makes the whole two or more universe fuse? The problem of the many-worlds interpretation is that it does not provide any explanation concerning what exactly makes these worlds split or merge.

In recent years, Deutsch[31] has modified the many-worlds interpretation (which he calls *theory of multiverse*) to solve the above criticism. Contrary to

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[30] Squires, Euan (1994), *The Mystery of the Quantum World*, 2nd edition, (Bristol; Institute of Physics Publishing), p.72

[31] Deutsch, David. (1997), *The Fabric of Reality*, (London; Penguine Books).

many-worlds interpretation above, Deutsch think the universe does not split or branch out, but that the universe started as an infinite number of identical universes. Every time quantum transition happens, those identical universes become different. This way, Deutsch does not have to explain the kind of force which is great enough to split or fuse an entire universe. The theory only requires minute inter-universe force which is sufficient to influence quantum phenomena, but not the entire universe. For example, in the double-slits experiment, two worlds can interfere without merging. Although it is elegant, the theory still does not explain what is or are inter-multiverse energy or force that enables two multiverses to influence each other.

The third objection against the many-worlds interpretation is that it is not possible to test whether the claim is true or false. Unless there is some way to prove that such inter-multiverse force exists to create the interference patter, the theory of multiverse is merely an baseless speculation which holds no credibility. Deutsch claims that he will provide the set up for the possible experiment to test the existence of multiverses based on the study of quantum computers[32]. If a certain calculation involves two possible process, the outcome would holds information for both processes. If there is a way to record both processes, it is possible to see whether or not the outcome is actually influenced by both these different processes. If the many-worlds interpretation is correct, records would show all possible processes. For the time being, we must wait for his thought experiment to be actually carried out, in order to judge the plausibility of the many-worlds interpretation.

Some consider the many-worlds interpretation to be a superior quantum interpretation to the Copenhagen interpretation and hidden variable theory. It has superb empirical adequacy without introducing implausible claims or unnecessary extra metaphysical claims. The theory, however, suffers from philosophical implausibility and economy. It assumes infinite coexisting universes that are influencing each other constantly at quantum level.

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[32] I am not aware of his actual paper but his unpublished paper was discussed in Marcus Chown (2001), "Taming the multiverse", in *New Scientist*, issue 2299, p.24-30.

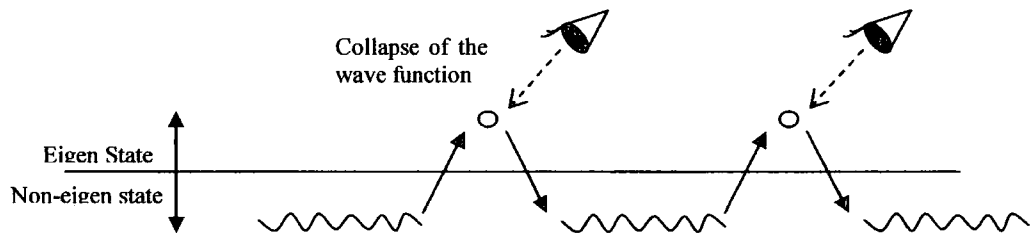
5.2.2.4. Zen metaphysical interpretation

Zen thinks everything we experience or comprehend is 空 (śūnya), so that nothing we understand is intrinsic to 寂滅 (nirvāna). This should include what we perceive as space, time, fundamental substance and causation. The quantum interpretations I examined above assume not necessary all but at least some of space, time, fundamental substance and causation to be intrinsic to the mind-independent reality. All interpretations above assume three-dimensional distance to be intrinsic to the mind-independent reality (寂滅; nirvāna). In other words they all assume the mind-independent reality to be at least three-dimension (hidden variable theories assume to be 3·n dimension). This is why they have difficulty in explaining the mechanism of how the quantum entanglement occurs. They have explained why two entangled particles is real, they behave as if there is no distance between them. In terms of substance, the Copenhagen interpretation thinks both wave and particle forms of matter are real. The matter exists either in eigen state or non-eigen state. The quantum potential theory thinks fundamental substance is particle and not wave. The particle exists in the quantum potential field which influence their behaviour. The many-world interpretation also thinks particles are genuine substance, and wave function describes a probability for the observer to be in a particular universe. In terms of causation, the Copenhagen interpretation rejects both the existence of causation and deterministic view of the world. It suggests that things happen without a cause and things happen at random. The hidden variable theories maintain causal deterministic view that nothing occurs at random without cause, so that the present state of the universe was determined by the past state of the universe and there will be only one possible future state that can derive from the current state of the universe. According to the hidden variable theories, only reason quantum phenomena seem to be at random is because there is a variable which we are not aware of but determines the behaviour of quantum particles. It is difficult to identify what the theory of multiverse thinks of causation, because it denies certain causations yet it postulates another kinds of causation. It denies causal deterministic view of reality. It explains that certain things occurs because we just happen to be in a particular multiverse where these things occurs, and there is no other reason to why thing

happens this way and not the other. Yet, when it tried to explain the interference patter that emerged in the double-slits experiment by introducing inter-multiverse causal influence.

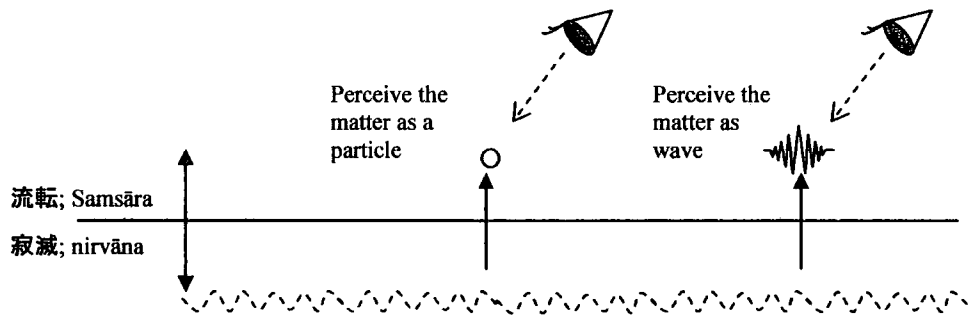
Zen thinks these what we perceived as space, substance and causation to be 空 (śūnya) and not intrinsic to 寂滅 (nirvāna). According to 空 (śūnyatā), the wave/particle duality can be explained in the same way Spinoza solved the mind-body problem. Spinoza thought that neither mind nor body is a genuine substance, they are *a mode of substance conceived under attributes of thought* and *a mode of substance conceived under attributes of extension.* In the same manner we can imagine that a matter is neither a wave nor a particle, but we just perceived as a wave or as a particle. It is against the idea of 空 (śūnyatā) to assume the matter to be either a wave or a particle. This approach has the advantage over the Copenhagen interpretation; since there is no need to postulate the collapse of the wave function which implies the discontinuous existence of matter. According to the Copenhagen interpretation, matter changes the state depending on whether or not it is observed by a conscious being.

[Fig.5.9] Copenhagen interpretation of matter changing its state



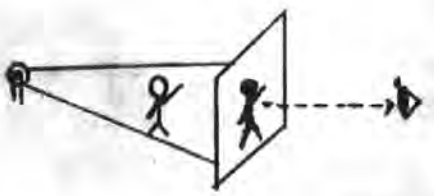
On the contrary, if we consider both eigen state and non-eigen state to be merely ways we perceive the matter to be and not the actual state of the matter, there is no need to postulate the collapse of the wave function by a conscious observer.

[Fig. 5.10.] Zen metaphysics interpretation



This interpretation of both wave and particle to be 空 (śūnya) can explain what seems to be discontinuous behaviour of quantum matter. In the double-slits experiment and the tunnelling effect, existence of the photon and the electron seems discontinuous in the sense that they seems to lose definite dynamic values such as momentum, location and spin. This is why the Copenhagen interpretation thought they turns into the probability wave when they are not observed. The idea of wave and particle to be 空 (śūnya) can be illustrated by the following example of a dancer and a shadow of the dancer. Imagine a man dancing between a screen and a light source, and we are watching his shadow from the other side of the screen.

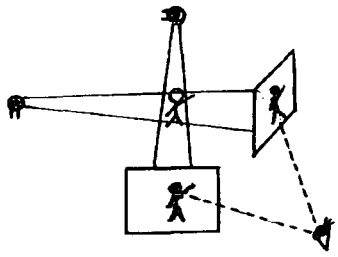
[Fig.5.11] A dancer and shadows



What we perceive as a dancer is not the dancer himself but the shadow of the dancer that appears on the screen. The movement of the dancer is exactly what we consider as dynamic values, such as momentum, location and spin. They are just how the dancer appears on the screen and not actually how he dances. Suppose we switch off the light for ten seconds (so that the shadow on the screen disappears for ten seconds). When the light is turned on again, the shadow seems to have moved in a discontinuous manner and his momentum location and spin seem to suddenly change. But this does not mean he moved in the discontinuous manner or suddenly comes into existence. During the ten seconds, even thought we cannot see the dancer dancing, it does not mean he ceases to exist or he stops dancing. He continues to exist and continues to dance even when we can not see him. In the same manner, even though we perceived the photon to disappear, it travelled without having dynamic values and sudden appears again on the photographic plate, it does not mean the photon changes its state or suddenly changed dynamic values. This dancer and screen analysis can also explain the quantum entanglement. Let me use the same dance and screens example, but this time there

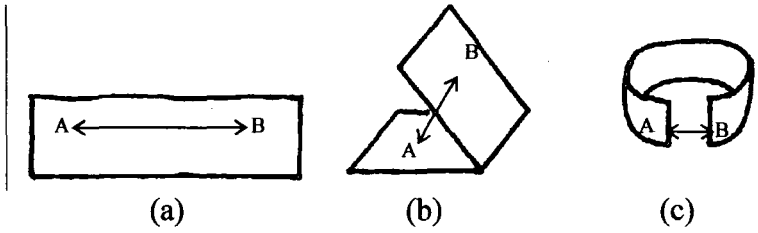
are two screens, two light sources, so that there are two shadows on the dancer;

[Fig.5.12] The simultaneous change of two shadows



According to the angle between screens and light sources, the two shadows may appear to be shadows of two different dancers, but they are still shadows of one and the same dancer. In this way, the two shadows move simultaneously without having any direct causal connection between them. In the similar manner we can imagine that two entangled particles L and R are capable of changing simultaneously because they are not two distinct particles but two distinct appearances of one and the same entity. This leads me to imagine that three-dimensional space and distance are also 空 (śūnya). If the three-dimensional space is not intrinsic to the mind-independent reality, we can explain how a single entity can appear at the different location. Suppose I mark two points A and B on a piece of paper. The closest distance between the two, in the two dimensional Euclidean space is as figure 5.13.a suggests, along a straight between the two points.

[Fig.5.13] Distances between two points



(a) (b) (c)

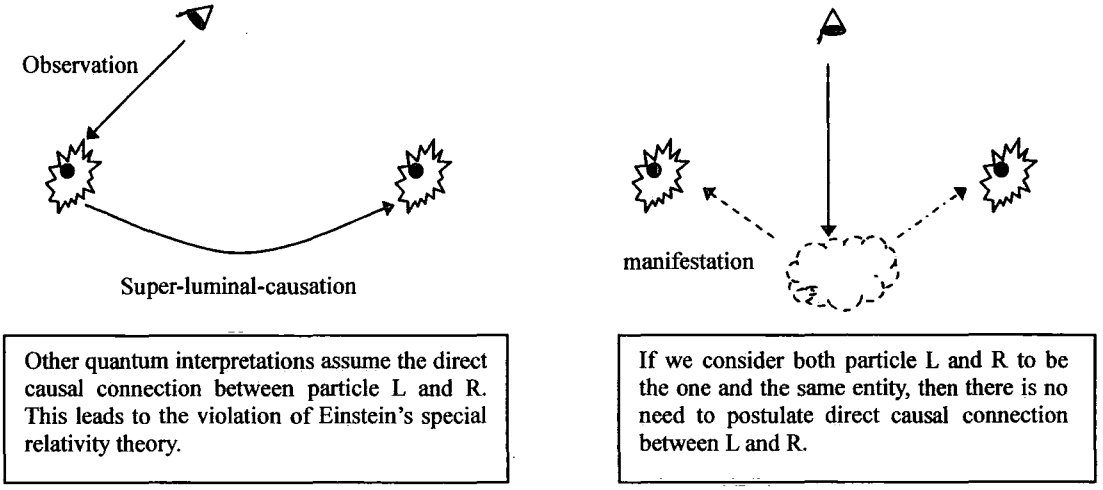
However, if I fold the paper, the closest distance between the two points gets much shorter than the straight line on the paper (see Fig. 5.13.b and c). In a similar way, because we think of a distance in the three-dimensional Euclidian

space to be absolute, we believe that two entangled particles cannot communicate instantaneously. But if we assume the distance in the Euclidian space to be relative and not absolute, we can accommodate the quantum entanglement. We are like those flatlanders (section 1.2.2.1.a) who are struggling to make sense of the penetrating conic object from two dimensional perspective. According to the idea of 空 (śūnyatā) nothing we experience and comprehend is the intrinsic nature of 寂滅 (nirvāna) because it is 有為 (samskrta), a product of human convention. This should include our perception of the reality to be three-dimensionally extended. Although we perceive the reality to be so, the mind-independent reality is actually not three-dimensionally extended. So what is the mind-independent reality like? The idea of 空 (śūnyatā) does not have an answer to this question. It only states although we perceive the reality to be three-dimensional, it does not mean the mind-independent reality is actually three-dimensionally extended. Moreover, the quantum entanglement suggests that the three-dimensional extension is not the intrinsic nature of the mind-independent reality. The assumption of the reality to be three-dimensionally extended is an useful 名色 (nama-rūpa) for providing a framework within which we can comprehend causation and fundamental substance, but it does not necessarily reflect the intrinsic nature of the mind-independent reality.

Concerning the quantum entanglement demonstrated by EPR-B experiment, there is something this 'shadows of a dancer' analysis cannot capture. That is the fact that the observer is also part of reality, and not a complete bystander. Everything that exists, exists in the domain of non-dimensional reality, and things can interact with each other without having three-dimensional manifestation of causal effect. This explains how the act of observation influences the dynamical value of the matter and how the entangled particles can instantaneously collapse. Other quantum interpretations assume direct causal connections between the observation and the entanglement of L and R. The latter causal connection, causal connection between L and R, is the problem since it violates special relativity theory. If we consider all observer, particle L and R and causal connections between them to be mere physical manifestations, then there is no problem explaining the instantaneous interaction between the observation, dynamic values

of left and right hand side.

[Fig.5.14] No direct casual chain between the observer, particle A & B



In this way it is possible for the two entangled particles to have what appear to be an instantaneous interaction, without actually having one. What this suggest is that if there were any causation at all, it is not physical. In other words, physical causation is 空 (śūnya) and it is not the intrinsic nature of 寂滅 (nirvāna). Chapter Seven examines why it is not plausible to sustain our belief in physical causation and determinism, but to state briefly in this chapter, our false belief in physical causation derives from our need to find a pattern and regularity, in order to simplify what we experience and comprehend, and there is nothing other than the success of classical physics to support the idea of reality to be causally determined.

This interpretation based on 空 (śūnyatā) is more plausible than the quantum interpretations mentioned above, regarding three criteria of 帰謬論法 (prasanga). It is compatible with all observable quantum phenomena as it was illustrated above. It has philosophically plausible in the sense of not containing a self-contradicting claim unlike other quantum interpretations. It also satisfy the criteria of the economy of theory. It does not contain any ad hoc idea in order to stay compatible with observable quantum phenomena.

There are several possible criticisms I can think of against this quantum interpretation based on 空 (śūnyatā). The most obvious objection is that it is too

sceptical. It denies both waves and particles to be genuine substances or fundamental quantum elements, yet it does not provide any positive claim to what the genuine substance is. It denies the mind-independent reality to be three-dimensional extension, but it does not say what the mind-independent reality is like or how many dimensions there in the mind-independent reality. It suggests physical causation to be 空 (śūnya), but it does not say what the actual causation is. Another problem of this interpretation is that, like the many-worlds interpretation, since mind-independent reality is not accessible to us, the interpretation is not falsifiable. So again, it is questionable to accept an interpretation which cannot be proved or disapproved. These criticisms are, however, not a problems for my thesis. The aim of this thesis is, as I explained in Chapter Two, "a reasoned refutation of all metaphysical views"[33] in order to prepare ourselves for the attainment of 悟 (bodhi). I am not aiming to create a certain metaphysical view. Rather, I am suggesting a view which contradicts existing quantum interpretations that assume some of space, time, fundamental substance and causation to be intrinsic to 寂滅 (nirvāna). .

5.3. Conclusion

We assume the reality to be spatio-temporal, because the reality appears to be spatio-temporal. But according to 空 (śūnyatā), the concept of space and time are merely tools that enable us to simplify the complex affair of reality, yet concepts of space and time do not reflect the true nature of the mind-independent reality. In order to defend this idea I looked into modern physics of relativity theory and quantum physics. The special relativity suggests that there is no definite flaw of time, and time and space are interwoven and cannot be discussed separately. This obviously contradict our concept of time. The quantum entanglement indicates that three-dimensional space may not be intrinsic to the mind-independent reality. Many quantum interpretations faced the difficulty of explaining why and how the quantum entanglement happens. But once we regard the distance in three-dimensional Euclidian space to be not absolute but relative, it is easy to

[33] Chakrabarti, Arindam (1995), "Metaphysics in India" in Kim, Jaegwon & Sosa, Ernest (eds.), *A Companion to Metaphysics*, (Oxford; Blackwell), p.319.

explain the quantum entanglement, which occurs faster than the speed of light.

As I explained at the beginning, the aim of this chapter is to establish a framework in which to discuss bare substance in Chapter Five and causation in Chapter Six.

6.

Substance

This chapter explores the question of what kind or kinds of fundamental element or substance compose reality. In history, there have been many candidates for the fundamental elements. Both Empedocles of Ancient Greece and Ajita Kesakambala of India thought earth, water, fire and air were fundamental elements. Cartesian dualism thought there were two kinds of substance; material substance and mental substance. Many modern thinkers believe physical substance to be the only kind of substance there is. Quantum physics suggests fundamental elements to the probability wave or/and quantum particle. If we apply the idea of 空 (śūnyatā), all our beliefs in existence of those fundamental elements or substances are 幻 (māyā) and 顛倒 (viparyāsa). No such things exist in 寂滅 (nirvāna) and they are simply how we perceive reality to be. Among all these candidates for genuine substance, I will concentrate on what we perceive as mental and physical substance, and aim to conclude that neither of what we perceive as physical nor as mental substance is genuine substance.

As in previous chapters, in order to prove that what we perceive as mental substance and as physical substance are 空 (śūnya), I use 帰謬論法 (prasanga). I argue 空 (śūnyatā) of what we perceive to be substance by illustrating the implausibility of theories that make positive claims about what kind of thing a genuine substance is or are.

In order to avoid making sentences unnecessarily long, I will use "physical substance" and "mental substance" to describe "what we perceive as physical substance" and "what we perceive as mental substance" and distinguish from "genuine substance". Therefore it has to be emphasised here that mental substance or physical substance does not directly imply that they are genuine fundamental

substance unless it is stated so.

6.1. Definition of substance.

Throughout the history of philosophy, the term substance has been defined in many different and often contradictory ways. Therefore, in order to avoid misunderstanding, I would like to clarify the definition of substance. There are two meanings for substance. We have already looked at the first meaning in Chapter Four (section 4.3.1.); substratum as a definer of numerical identity. The second meaning is as a basic building block of existence. The substance in the first sense defines how many things are there, while the latter concerns what kinds of things are there. In other words, the former concerns whether the universe is consist of single all encompassed being or a composite of individuals, whereas the latter deals with legitimacy of material substance, physical substance and so forth to be genuine substance. These two definitions are not directly linked because there are three possible combinations of the two. The first is that there are many substances but they are all of one and the same kind. The second is that there are many substances and they belong to two or more different kinds. The third is that there is only one substance therefore there is only one kind. I have already dealt with the first meaning of substance in Chapter Four therefore the main concern of this chapter is to explore the second meaning.

Aristotle[1] recognised various kinds of "to be" (and later Hoffman and Rosencrantz[2] recognised at least eleven different kinds of "to be"). Among them, there is a special kind of "to be" that is being substance. The most widely accepted way of distinguishing substance from other kinds of being is that substance is the only thing that is *ontologicaly independent.* Ontological independence is the idea that other kinds of "to be" require something other than themselves to inhere or exhibit them, whereas substance does not depend its existence on anything else but itself. According to Husserl[3], the basic definition of

[1] Aristotle, Book Zeta, *1028 a10-a15* . I use an interpretation by Bostock, David. (1994), *Aristotle Metaphysics - Books Z and H -*, (Oxford; Clarendon).
[2] Hoffman & Rosenkrantz (1997), *Substance - Its nature and existence -*, (London; Routledge), p.46-50.
[3] Husserl, E. (1901), *Logical Investigation*, Findlay, J.N. (trans.), (1970), (London; Routledge & Kegan Paul)

the term "ontological independence" is as followed; *x* is said to be ontologically independent from *y*, iff (if and only if) *x* can exist without the existence of *y*. Resulting from the above definition, *x* is said to be a substance, iff *x* does not require anything else but itself to exist. Most, if not all criticisms against the ontological independence of substance can be avoided by strengthening and clarifying exactly what is meant by "ontological independence". I will look at three particular criticisms in order to identify the weakness of the basic definition of ontological independence and put forward a plausible, strong and agreeable definition of the term. The first problem of the definition of substance is that any complex organic being, such as we humans and animals, can not fulfil the criteria of substance. As Kripke[4] puts forward, every human must have originated from other pre-existing individuals, such as parents, egg and sperm. I could not be here if my parents had not existed or my parents' parents. This means that every human being or any living being fails to satisfy the criteria of ontological independence. Furthermore, nothing in the universe can be classified as substance, if modern scientists are right about the big bang or super strings. Everything that exists depends upon the big bang or super strings to have created the universe within which everything exists. This means that nothing in the universe satisfies the criteria of substance since nothing could exist without the universe. This problem Kripke proposed can be dismissed by distinguishing strong and weak ontological independence. The weak ontological dependence is historical dependence, like the case of the child and the parents. Once a child is born, his or her existence is not ontologically dependent on the parents, because the child can continue to exist even after the parents' death. The strong ontological dependency is that *x* is said to be ontologically dependent on *y*, iff annihilation of *x* necessarily coincides with *y*'s annihilation. According to this definition of strong ontological independence, a child does not ontologically depend on his or her parents, since the parent's death does not necessarily result in the child's death.

The second problem of the basic definition of ontological independence is mentioned by Hoffman and Rosenkrantz;

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[4] Kripke, Saul. (1972) "Naming and Necessity" in Davidson, D. & Harman, G. (eds.) *Semantics of Natural Language*, (Dordrecht; Reidel).

> Wives are substances, as are both widows and wives to be. However, if a wife (widow, wife to be) exists, then this entails that another substance exists (did exit, will exist), namely a husband.[5]

By the definition of these terms, there cannot be a wife without a husband and a husband without a wife. Some philosophers, therefore, argue that neither wife nor husband can be substance. This sort of criticism can be dismissed as *level confusion*. It is level confusion because being a wife and being an individual who is referred to as a wife are not the same thing. A woman's existence does not depend on being a wife, since she could continue to exist even after she ceases to be a wife. This means that, although her existence *as* a wife depends on an existence of a man *as* a husband, her existence as an individual does not depend on a man who is referred to as her husband, therefore she is ontological independent.

The third problem about ontological dependence is that it is often mixed up with *causal dependence*. Seventeenth century philosophers such as Spinoza and Leibniz included causal independence into their definition of substance. According to causal independence, for x to be a substance, x should not be causally influenced by any other substance or being. In other words, the individual substances should not causally interfere with each other. However, the inclusion of causal independency only creates unnecessary problems. For Spinoza, the only thing that can fulfil the criteria of substance was God (in his sense the universe as a whole). For Leibniz, it forced him to establish an idea known as "pre-established harmony of monads". Causal independency is not a necessary part of ontological independence. It is possible for two objects to causally interact without ontologically dependent on each other. For example, although I causally interact with my car (the car takes me to where I want to go and the car moves because I drive), but the annihilation of my car does not necessary coincide with my annihilation and vice versa. According to these above clarifications, mental substance is a genuine substance if and only if its existence does not necessarily coincide with the existence of anything. Similarly, physical substance is a genuine

[5] Hoffman, J. & Rosenkrantz, G (1997), *Substance - Its nature and existence* -, (London; Routledge), p.44.

substance if and only if its existence does not necessarily coincide with the existence of anything else.

6.2. Theories of substance

This section (section 6.2) examines major theories that assume mental substance and/or physical substance to be genuine substance. In order to argue that both mental and physical substance are 空 (śūnya), I aim to demonstrate philosophical implausibility of these theories.

6.2.1. Ontological Idealism

Ontological idealism is an idea that there is only one kind of substance, mental substance, and there is no reason to believe in the existence of physical substance. Ontological idealism is related to Berkeley as well as the Yogācāra school of Buddhism (瑜伽行派). Berkeley's idea is represented by the famous "esse est percipi (to exist is to be perceived)[6]".

> so long as they are not perceived by me, or do not exist in my mind or that of any created spirit, they must either have no existence at all, or else subsist in the mind of some eternal spirit[7].

The same idea was held 1400 years prior to Berkley by the Yogācāra school of Buddhism. They believed in "*vijñānavāda*" which is a principle that whatever we experience and comprehend exists only in our mind and it is our mistake to think there is anything other than what we conceive.

Ontological idealism is derived from epistemological idealism which was mentioned in Chapter One. Epistemological idealism is the notion that all we can comprehend is limited to what is in our mind and we are not capable of comprehending anything else other than via a corresponding idea or concept. In other words what we perceive as physical substances or phenomena are in fact

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[6] Berkeley, George. (1734), *A Treatise Concerning the Principle of Human Knowledge*, Principle 3.

[7] Berkeley, George. (1734), ibid., Principle 7.

merely ideas. This was supported by a thought experiment devised by Bradley[8]: If we think of a physical object and take away everything we know about the object which relates to sensation, thought, memory and other mental aspects, we are left with a mere blank. This gives rise to a doubt about the existence of physical substance. In fact Berkley thought it was a mistake to assume the existence of physical substance that "there is not any other substance than spirit, or that which perceives."[9]

This doubt about the existence of physical substance leads also to an idea that mental substance is a genuine fundamental substance, because it suggests a possibility of *body-less-mind,* i.e. the ontological independence of mind from body. Epistemological idealism showed a possible scenario of reality where mind exists but physical substance does not exist at all. We are sure about the existence of mind, but we cannot be equally certain about the existence of physical body. If this suspicious is true, the annihilation of body does not necessarily coincide with annihilation of body. To play devil's advocate, if mind is ontologically depended upon body, then the existence of mind must necessarily coincide with the existence of body, and annihilation of body necessarily leads to the annihilation of mind. Therefore, if mental substance were not a genuine fundamental substance it is not possible for mind to exist without body. Since epistemological idealism illustrates a possible scenario where the mind could exist without physical substance, the mental substance must be a genuine substance. Although the ontological idealism heavily depends upon the epistemological idealism, the two have to be distinguished, as the latter does not necessarily imply the former. In other words, one can accept epistemological realism without admitting to ontological idealism; even though the directly comprehensible is limited to an idea, it is possible to assume the existence of physical world and a physical substance behind and beyond mental world.

The first problem of ontological idealism is that it can only speculate, but unable to prove that there is no physical substance at all. As I stated above, epistemological idealism does not imply ontological idealism. Epistemological idealism is like a double-edged sword. It indicates that there is no evidence to

[8] Bradley, F.H. (1930), *Appearance and Reality*, (Oxford; Clarendon), Chapter 14.
[9] Berkeley, George. (1734), ibid., Principle 10.

prove that physical substance exists yet at the same time, we could also conclude that there is no evidence to prove that there is *no* physical entity or physical substance. It is, however, wrong to accuse Berkeley and Yogācāra of this flaw, as their intention was to make us question our belief in physical reality or physical substance as a genuine substance, rather than positively denying the existence of physical substance.

The second problem of ontological idealism is that it implies solipsism. The reasoning ontological idealism employs to question the existence of the physical world can also lead to the possibility that there is nothing other than my mind, since that is only thing I have direct access to. Other than my own mind, the whole world and everything I believe to exist may be my own creation, as I stated in section 1.1.1. The solipsism is a problem because it leads to the defeatism that renders any philosophical or scientific enquiry pointless.

The third problem is that ontological idealism faces the difficulty of explaining the orderly arrangement of the physical world, in terms of both causation and the continual existence of physical objects. Ontological idealism argues that everything we think or we know about the physical world or physical objects can be reduced to our sensory experience. If the theory were correct, a copy of Zen text Shōbōgenzō in front of me is nothing more than a bundle of ideas, memories, visual sensation and tactile sensation, so that the book disappears when I look away. It is, however, hard to accept such an idea as plausible. Every time I open the text, the passages are there in the right order. If the text and its contents were merely aspects of my mind, since I am a forgetful person, it would surprise me that the passage was not jumbled up as it is in my memory. Similarly it is difficult to explain the regularity and universality of physical causation, if physical causation is not real. Even for an observer who has no knowledge of astrophysics, the stars move according to the law of universal gravity and the colour of a star follows the law of emission spectroscopy. Ontological idealism faces difficulty in explaining how celestial movement could be so regular if it is reliant on experience. Berkeley argued that objects continue to exist when not perceived by our finite minds, because they are perceived by God, and it is God who bestows the regularity. For modern thinkers, this explanation based on the

existence of God is not a plausible solution.

The fifth problem is one related to the body-less-mind argument. Because dualism also uses the same argument, and the problem is directly related to the plausibility of physicalism, I will discuss this later.

6.2.2. Dualism

Dualism is the idea that there are two kinds of substance; mental substance and physical substance. Although the idea is strongly related to Descartes, I will present the most plausible form of dualism rather than that of Descartes[10]. There are four reasons for people to believe in dualism. The first is ontological independence between mental and physical substance. It is easy to understand physical substance to be ontologically independent from the fact that objects such as a chair, an apple or a book can be composed of physical substance alone without any mental substance necessarily accompanying them. An argument for the ontological independence of mental substance is similar to the body-less-mind argument mentioned in the previous section. Descartes' famous "cogito, ergo sum (I think therefore I am)" proved the existence of his mind (if the mind did not exist, then thinking would not be possible), but the ability to think does not prove the existence of body. The existence of mind is "clear and distinct" because it is self-evident, but the existence of body is not as "clear and distinct" as mind, because its existence is not self-evident and there is room for doubt. When Descartes was thinking about himself, he could be sure that he was a mental substance of a thinking entity, but there was no proof that he was also a physical substance. This proves that the existence of physical substance does not necessary coincide with the existence of mental substance. According to the definition of substance, this makes mental substance to be ontologically independent from physical substance, therefore it is a genuine substance.

The second reason to support dualism is the two distinct ways for all things to exist. Physical substance exists in the three-dimensional physical domain, but

[10] Descarte's own view is different from the widely accepted dualism. Descartes believed that there were three kinds of bare substance; in addition to the two there is a perfect substance God. Descartes also took a monistic view on physical substance. He thought that there was only one physical substance, and that individual physical entities were all modes or finite aspects of this single physical substance. These two ideas are not necessarily included in modern dualism.

mind does not exists in this domain. This does not mean that mind does not exist, it is just that the mind seems to exist in a non-physical domain. This suggests that there are at least two different ways for a thing to exist; in a physical domain or in a non-physical domain. If there are two distinct ways to exist, there must be two distinct kinds of substance that actualise the existence. One is a physically extended substance which exists in a physical domain and the other is mental substance that exists in a non-physical domain. Because physical substance is not capable of existing in a non-physical domain in the same way that mental substance is not capable of existing in a physical domain, they must be defined as distinct.

In addition to the above two philosophical arguments, there are two sentimental reasons to believe in dualism. Firstly dualism is popular because it accords with our common language and conception. In our everyday life, we feel body and mind (or body and soul) to be two distinct things. For example you may say "my body was tired but my spirit was high" believing physical exhaustion is not necessarily connected to mental weariness. We distinguish psychological trauma from physical injury. These common conceptions lead us to assume that mind and body are different and distinct. Otherwise, bodily and mental exhaustion would concur and physical injuries would result in similar psychological trauma. Secondly, many people believe in dualism because religions often imply a mind/body distinction. Without ontological independence of mind from body, religions face a difficulty in explaining life-after-death, reincarnation, final judgement, spirits and so forth. Aquinas[11] thought, since human beings were individuated by matter during life but lacked it after death, human individual could retain identity and individuality thanks to the individuality of the immaterial body (i.e. soul).

The most well known problem of dualism is the causal connection between mind and body which is often known as the *mind-body problem*. It is easy to see how two physical entities such as a snooker ball and the table interact each other, since they follow the same laws and rules of physics. The mind works and interacts with other minds according to the mental process observed by

[11] Aquinas St. Thomas, "Soul in Human Being," in McDermott, Timothy (ed. & trans.) (1993), *Thomas Aquinas Selected Philosophical Writings* (Oxford; Oxford Univ. Press), p.185.

psychology, sociology and anthropology. The problem is explaining how two kinds of substance that follow different sets of laws and rules can influence each other. Every day and every minute, my mind and body interact with each other. Sense organs of my physical body trigger mental experience. My mind commands my physical body to move in a certain way. Moreover, to make the matter worse, both the physical causal chain and the mental causal chain seem to be closed and there is no room for one to interfere with the other. Developments in physiology and neuroscience reveal that brain cells and nervous systems are nothing more than simple physical entities whose behaviour can be explained using physico-chemical laws, and there is no room for intention, desire and other mental activity to influence the working of cells. This implies that there cannot be any causal interaction between mind and body. Dualism normally presents two possible replies to the mind-body problem; occasionalism and parallelism. They are however not plausible enough to rescue dualism from the mind-body problem[12].

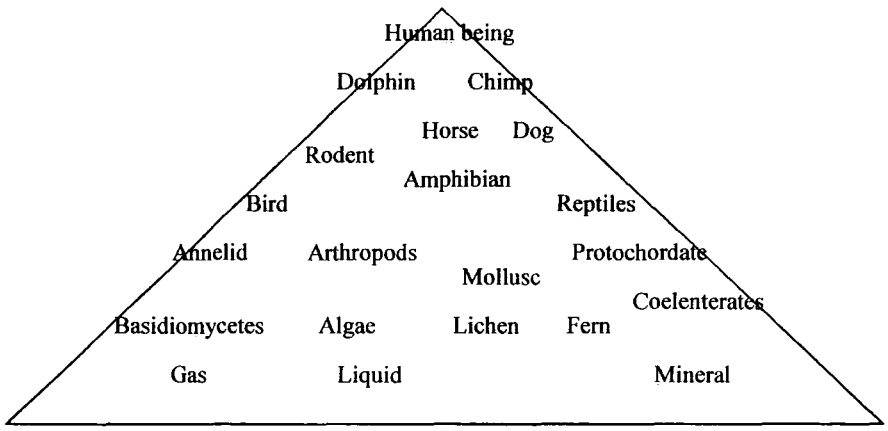
Zen would disagree with dualism since it implies the clear distinction between animate and inanimate objects. According to dualism, everyday objects[13] can be divided into two kinds; animate and inanimate objects. The former is capable of possessing thought and consciousness because it is composed of both

[12] Occasionalism is an idea or a belief that God continuously interferes with reality. Because supporters of occasionalism accept the objection that mental and physical substance do not follow the laws, they cannot *directly* interact with each other. Instead, mind and body interact through the medium of God. The problem of occasionalism is that it relies too heavily on the existence of God. In order to explain simple everyday tasks substance dualism has to rely on the constant mediation of God between mental substance and physical substance. Personally, I think that if God is omnipotent then he will make things easier for himself, so that he does not have to constantly interfere with every tiny matter. Parallelism also accepts the criticism that because mind and body follow two separate sets of laws, they cannot interact with each other. Parallelism argues that even though it appears to have certain connections, there is no causal interaction between mind and body. According to parallelism, mind and body are like two clocks that have been set to the same time. Although there is no causal interaction between them, they continue to indicate the same time and chime simultaneously as if they are somehow connected. The problem of parallelism is the difficulty of explaining how two kinds of bare substance can co-ordinate so precisely with each other. Parallelism implies that my mental decision to pick up a glass of orange juice has nothing to do with my arm actually picking the glass up. My arm reaches out regardless of my mental decision, and the dehydration of my body has nothing to do with my feeling of thirst. In order to explain this problem, parallelism must rely on either an omnipotent God who set two kinds of substance so precisely at the beginning of the world or coincidence on a cosmic scale. Neither explanation is satisfactorily plausible.

[13] I am excluding angels and body-less- souls, since I do not believe they should be discussed alongside animate and inanimate objects.

mental and physical substance, whereas the latter is not capable of possessing thoughts and consciousness, because it is made up only of physical substance. We have already seen several arguments that are related to the idea that animate/inanimate distinction is 空 (śūnya). In Chapter One and Three, we learned that any A or not-A distinction is 空 (śūnya). This should include the qualitative division between animates and inanimate objects. Such a distinction is not intrinsic to the mind-independent reality (寂滅; nirvāna), and it is 有為 (samskrta), a product of human invention. This contradicts with what dualists imply. They believe that an object is composed of either one or two substances, so that the distinction between animate and inanimate objects must be clear and distinct. In order to clarifying the implausibility of the animate/inanimate distinction to be intrinsic to 寂滅 (nirvāna), I will divide it into three sub-problems; synchronic, revolutionary and developmental problems of animate/inanimate distinction. The synchronic problem is the problem of judging which organic object is an animate object and which object is not. We assume a hierarchy of objects according to mental capacity and organic complexity.

[Fig 6.1.] Hierarchy of organisms



Dualism implies a sharp division between animate and inanimate objects, because objects are made out of either physical substance alone or physical substance as well as mental substance, with no middle ground. In other words, dualism implies a definite boundary in the above hierarchy. It believes animals to be animate objects and plants to be inanimate objects, therefore the animate/inanimate boundary must lay somewhere between the two. But where precisely is the

division? Does an insect (arthropod) or a jellyfish (coelentrate) possess thought or consciousness? What about a sponge (phylum porifera) or a sea cucumber (holothurian)? Are these animate objects capable of possessing thought or are they inanimate object like plants or minerals that are not capable of possessing any form of consciousness? Contrary to what dualism implies there seems to be no definite distinction between the animate and inanimate objects.

According to the Darwinian theory of evolution, even a complex organism that is capable of possessing thought and consciousness evolved from a simple cell organism which did not possess consciousness. This means there must have been a distinct point in evolutionary history when inanimate objects became animate objects. Like the synchronic problem of the animate/inanimate distinction, if dualism were true, then such a turning point in evolution must be definite, since objects are composed of either physical substance alone or a combination of physical and mental substance. It is, however, implausible to think that one generation of organism consisting only of physical substance produced a next generation which was composed of mental substance as well as physical substance. This is the second problem of the animate/inanimate distinction which I call 'the evolution problem'.

The third problem of the animate/inanimate distinction is the problem of at which point in pregnancy the foetus becomes an animate object capable of emotion, thought and consciousness. A fertilised egg begins cell division, and gradually develops a spine, nerve system, and brain, and by the end of pregnancy a complete infant is formed. After the birth, the baby changes into a child and then into a fully grown adult. We consider the adult human, child and baby to be animate objects that are capable of possessing thought and consciousness. According to dualism, this defines them as being composed of mental and physical substance. Whereas we consider the sperm, egg or newly fertilised egg to be composed solely of physical substance, because we do not believe that they are capable of any mental activity. This suggests that there must be a definite point in biological development where the simple inanimate entity made out of only physical substance becomes an animated complex organism consisting of both physical and mental substance. According to what dualism suggests, such timing

should be very definite.

I agree that it is possible to take a pantheistic position (that all objects are made out of both mental and physical substance), but this defeats the whole point of substance dualism, which attempts to deal with unresolved issues: Why are certain objects such as a human and a dolphin capable of possessing consciousness while other objects such as a plant, a rock or a table are not? Why do animate objects behave differently from inanimate object that only follow physical causation? By introducing the idea that there are two kinds of substance the dualist explains these differences. Therefore to say that everything is composed two kinds of substance bring back the original question of why certain objects are capable of possessing consciousness and thought while others are not.

Fourthly, dualism was popular since it is compatible with religious belief. It allows the possibility of life-after-death and spirit. However since religious beliefs are no longer taken for granted, the compatibility to religious belief cannot be used to defend plausibility of dualism.

The final problem of dualism is common to ontological idealism which is the problem related to the body-less-mind. Both dualism and ontological idealism assume mental substance to be a genuine substance based on body-less-mind argument (e.g. the possibility that the existence of mind does not necessarily coincide with the existence of physical body). The problem is that both dualism and ontological idealisms fail to distinguish what is imaginary and what is actual. We can *imagine* a body-less-mind but it does not mean mind can *actually* exist without body. The body-less-mind is an *imaginary entity* rather than an actual entity. We can imagine a unicorn or a goblin, but that does not mean the unicorn and the goblin exist at the same ontological level to actual objects such as you, me, a table, a rock or a river. In the same way, even if we can imagine the mind as being ontologically independent, it does not means that this is actually the case. The body-less-mind argument can speculates but never proves mental substance to be a genuine substance. Physicalism, which is examined in the next section, provides evidence to deny such speculation.

6.2.3. Physicalism

Physicalism is the idea that physical substance is the only kind of substance there is, and what we perceive as mental substance ontologically depends upon physical substance (i.e. mental substance is not a genuine substance). The term "physicalism" covers diverse theories of mind including behaviourism, type/type identity theory, token/token identity theory, eliminativism, anomalous monism, functionalism and so forth. This thesis does not deal with these theories separately, because their difference concerns the relation between mental state and physical state or between mental event and physical event. What I am interested here is the underlining assumption that these different kinds physicalism share. They all assume physical substance to be only genuine substance and mental substance ontologically depends upon physical substance.

Physicalism is popular because it conforms with findings from physiology, neurology and so forth that the physical causal chain is closed. In Horgan's words,

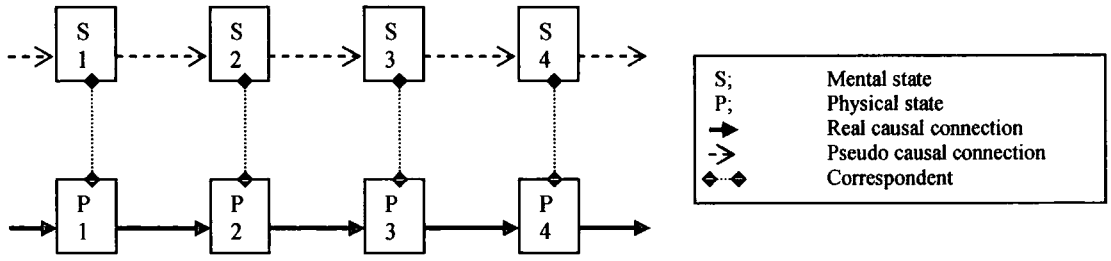
> "[physicalism believes] the human body is a causally complete physico-chemical system; although the body is highly susceptible to external causal influence, all physical events in the body, and all bodily movements, are in principle fully explainable in physico-chemical terms.[14]"

This means there is no scientific evidence that the mind has any causal influence upon our state of mind and body. This is why most physicalisms support epiphenomenalism which considers mind to be a non-causal by-product of a physical process. It assumes that although physical processes of the brain trigger and alter mental states, the brain process is a mere physico-chemical change of the brain and it is not influenced by mental activity. For example, although I think my feeling of thirst (S1) causes a desire to drink a glass of orange juice on a table (S2), there is no direct causal connection between the feeling and the desire. The whole process can be explained as dehydration of the body which sends neuro-electric signals to the brain and these signals change state of the brain without being

[14] Horgan, Terence E. (1995), "Physicalism (1)", in *A Companion to the Philosophy of Mind (paperback edt.)*, (Oxford; Blackwel), p.471-478.

affected by any mental state.

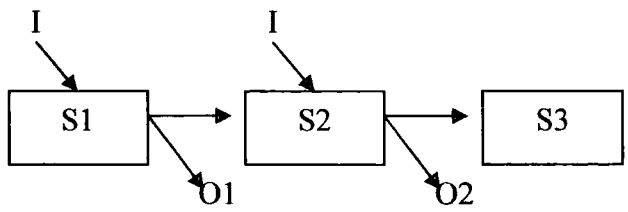
[Fig.6.2.] Epiphenomenalism



As Broad[15] describes, epiphenomenalism thinks that either a mental state does not function at all as a causal factor (causally inert), or it participates in causation by virtue of its corresponding physical state. This leads to a problem known as "intentionality". Epiphenomenalism implies that the mind has no causal role in both physical and mental activity. In other words, although we perceive ourselves to be free agents, we do not have free will at all. We are no different from inanimate objects whose behaviour is solely influenced by physical causation.

Functionalism is the physicalist's answer to problems derives from epiphenomenalism. Functionalism regards mental states as having a certain causal role. Functionalism, as its name suggests, defines a mental state in terms of the function of its physical entity. The way a mental state causally influences behaviour and a subsequent mental state can be explained using the working of the "Turing machine"[16] which is the basis of a modern computer.

[Fig.6.3] Turing machine



Mind and body interact like the software and hardware of the computer. Software

[15] Broad, C.D. (1925), *The Mind and Its Place in Nature*, (London; Routledge & Kegan Paul), p.473.
[16] Turing Alan M. (1950), "Computing machinery and intelligence", in *Mind*, vol.59, p.433-460.

determines the state of a computer and how it reacts to an input. If the machine is in the state S1 and receives the input *I*, it gives the output *O1* and goes into the state *S2*. When the machine receives the identical input *I*, if the machine is in the different state *S2*, the outcome is *O2*, and *S3*. This illustrates how mental states have a causal role and not a causally inert one as other theories of physicalism imply. Functionalism is still physicalism with regard to substance, since it believes mind or mental state ontologically depend on body (physical entity). To use the comparison with computer, software still requires a physical body to exist, in a form of a floppy disk, a CD-Rom, or a hard drive. In other words, mind cannot exist without physical body.

Although functionalism set out to solve the problem of epiphenomenalism, it still has failed to solve the problem of intention. The problem of intention which functionalism faces can be illustrated by the "Chinese Box" thought experiment devised by Searle[17]. What the Chinese box represents is how a computer functions. A computer follows instruction without comprehending what it is doing. If an animated object is simply an organic computer as functionalism assumes, then how the object feels, thinks, knows or intends does not influence the outcome at all, as the Chinese box experiment demonstrates.

The second problem physicalism encounters is epistemological idealism. As we saw in the ontological idealism, we have no direct access to a physical entity and physical substance. All we experience or comprehend are merely aspects of the mind. So there is no independent reason for us to believe that physical substance actually exists, and the only reason the physicalist can give is that we perceive the world to be physical. This makes physicalism to be a mere speculation like ontological idealism.

The third problem concerns an assumption that physicalism is based upon.

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[17] Imagine a box which contains an English man who has no knowledge of the Chinese language. A series of questions written with Chinese characters are posted through a small opening of the box. His task is to write answers, also in Chinese and send them out. If he is equipped with a book which includes all the possible questions and their answers, by matching a Chinese character on the question card with an answer in the book, he can give a correct answer without understanding Chinese characters on either the question card nor the answer card. For a Chinese observer standing outside the box posting in a series of questions, the person in the box appears to comprehend Chinese, and he cannot tell that the man in the box does not know a word in Chinese. (in Searle, John. (1980) "Mind, brains, and programs" in *Behavioral and Brain Science*, Vol.3, p.417-24.)

Physicalism assumes physical causation to be close and complete (i.e. causal determinism). This leads physicalists to conclude that regardless of how complicated an object is, the behaviour and existence of any object can be explained solely in terms of physical causation and substance, and there is no room for any other substance or causation. If physical causation is closed and complete even human behaviour is ultimately in accordance with physico-chemical causation. This assumption is based on classical physics which has been proven to be wrong by Quantum physics. Quantum physics such as Heisenberg's uncertainty principle and Schrödinger's wave function (section 5.2.1.2) indicate that contrary to what classical physics assumes, physical causation is neither close nor complete. In fact there is even a possibility for no causation to exist at all, and everything happens at random. I will discuss 空 (śūnyatā) of physical causation in the next chapter, but there is a doubt to the legitimacy of the assumption, upon which physicalism is based.

The final problem for physicalism is again related to quantum physics. According to quantum physics, what we perceive as a physical substance may not be physical at all. In other words, quantum physics suggests that such a substance may not even exist. Traditionally, physical substance is defined in contrast to mental substance. Physical substance follows physical causation and has definite dynamic values such as having mass (being three-dimensionally extended), having location (existing in three-dimensional space), having momentum and having energy, whereas mental substance follows non-physical causation (mental causation) and has no dynamic values, no mass, no location in three-dimensional space, no momentum and no energy. What quantum physics suggests is that what are regarded as physical substances do not satisfy the traditional criteria of physical substance. As I stated earlier Schrödinger's wave function and Heisenberg's uncertainty principle indicate that physical causation cannot explain the behaviour of what are perceive as physical substance (i.e. physical substance does not follow physical causation). The wave/particle duality (section 5.2.1.1), the tunnelling effect (section 5.2.1.2) and the quantum entanglement (section 5.2.1.3) show that what we perceive as physical substance does not have definite dynamic values. To play devil's advocate, if physical substance has definite

dynamic values, a photon would not create an interference pattern, an electron which does not have sufficient momentum could not pass through the potential barrier and two entangled particles could not have instant communication between them. These quantum phenomena are possible only because physical substance does not have definite dynamic values. What is perceived as physical substance cannot be what physicalists call physical substance, since it does not follow physical causation and has no definite dynamic values. The way to solve this problem is to apply Zen's concept of 空 (śūnyatā) which states that whatever we experience and comprehend is not the way the mind-independent reality (寂滅; nirvāna) actually is. Whatever we comprehend as physical substance is 空 (śūnya), so that it is not physical at all.

6.3. 空 (śūnyatā) of physical and mental substance

I have so far analysed theories that postulate mental and/or physical substance in order to examine the possibility for what we comprehend as mental and/or physical substance to be a genuine substance. The analysis of these theories supports the view that neither substance is a genuine substance. What we comprehend as mental substance is unlikely to be genuine substance, since the body-less-mind argument, which, both ontological idealism and dualism employ, does not satisfy philosophical plausibility. The argument is only adequate enough to speculate but fail to prove ontological independence of mental substance. Implausibility of mental substance to be genuine substance also derives from two further arguments. One is the third argument against ontological idealism; it is difficult for ontological idealism to explain the orderly nature of what we perceive as the external world. The other is falling into solipsism (see section 6.2.1). If everything I comprehend was a mere aspect of my mind, then there would be no reason to refute solipsism. Dualism, the other theory which assume mental substance to be genuine substance, also turned out to be not plausible since it leads to the mind-body problem and the problem of animate/inanimate distinction. Without introducing highly implausible explanations, such as occasionalism and parallelism, dualism cannot fully explain the mind-body interaction that occurs all the time. Moreover, the animate/inanimate distinction that dualism implies is

impossible to defend as it opposes the 空 (śūnyatā) of qualitative divisions mentioned in Chapter Three.

To consider what we perceive as physical substance to be genuine substance also raise problems. The problems are exactly as mentioned in arguments against physicalism. As epistemological idealism suggests, because what we can directly experience or comprehend is limited to what appear to our mind, we can only speculate the existence of physical substance in the mind-independent reality and there is no solid reason to believe that physical substance actually exists. More damagingly, science which is supposed to support the existence of physical substance actually contradicts its existence. It is not possible to explain the wave/particle duality, the tunnelling effect or the quantum entanglement if what we define as physical substance is genuine substance. A more plausible explanation is that matter is not physical, and we just perceive as physical. Matter does not follow what we perceive as physical causation, it has no dynamic values such as mass, location and momentum. It suggests that physicality of matter might be merely how we perceive substance to be and it is not part of the intrinsic nature of genuine substance.

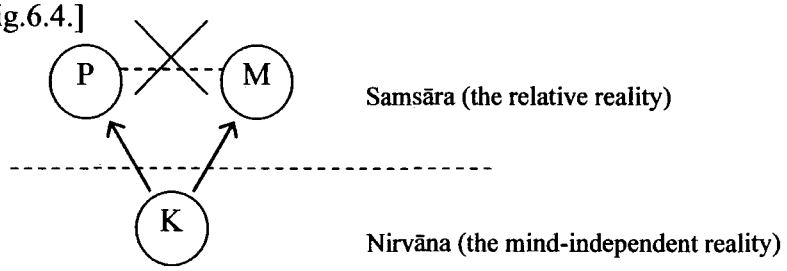
These denial of both mental and physical substance coincides with Zen's concept of 空 (śūnyatā). According to 空 (śūnyatā), whatever we, the unenlightened, understand, is not the way the mind-independent reality (寂滅; nirvāna) actually is. This should include our understanding of everything to be made out of mental substance and/or physical substance. They are simply ways we perceive the world to be, and they do not exist in the mind-independent reality. Moreover, according to 空 (śūnyatā), no division or distinction exists in the mind-independent reality (寂滅; nirvāna), so that any dualistic understanding only leads to 幻 (māyā) and 顛倒 (viparyāsa). All western theories examined above think of substance in terms of a distinction between physical or not-physical, and the distinction between mental or not-mental. If the concept of 空 (śūnyatā) is applied to the topic of substance, the genuine substance is neither physical nor not-physical and neither mental nor not mental. The genuine substance is neither mental nor physical, and exists behind and beyond mental and physical domains.

In other words, mental and physical arise from being perceived by us. In Shaner's words;

> Body and mind can be interpreted as distinct entities only by reflectively abstracting mental and physical aspects of a person's original pre-reflective experience.[18]

This interpretation of substance based on the concept of 空 (śūnyatā) can be described as bi-epiphenomenalism. It is an idea that mind and body are both epiphenomena, causally inert effects of something which is neither physical or mental. Bi-epiphenomenalism has advantages to solving several problems that theories of substance examined above. Firstly bi-epiphenomenalism can successfully explain how mind and body are in unison without having a direct causal relation between them. The mental state (M) and the physical state (P) coincide because they are two aspects of one and the same substance (K). We cannot experience genuine substance (K) but only as metal phenomena (M) or as physical phenomena (P).

[Fig.6.4.]



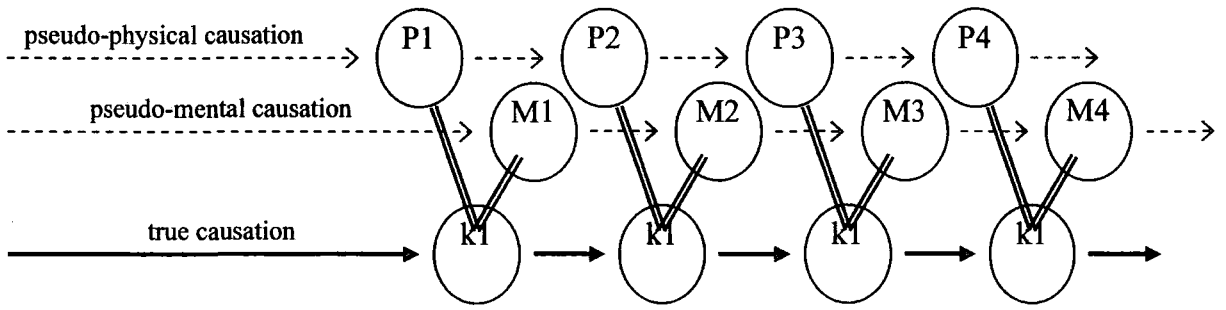
The relation between a state of the genuine substance, physical phenomena and mental phenomena is similar to the relation between the dancer and two shadows I described in the previous chapter (section 5.2.2.4). The two phenomena can coincide without having apparent direct causal connection between them.

This interpretation not only solves the problem of mind-body interaction, but it can also explain why both mental and physical causal chains seem to be closed and mutually exclusive. According to the above interpretation, there is no direct

[18] Shaner, David E. (1985), "The bodymind experience in Dōgen's Shōbōgenzō: phenomenological perspective" in *Philosophy East and West*, vol.35, p.17.

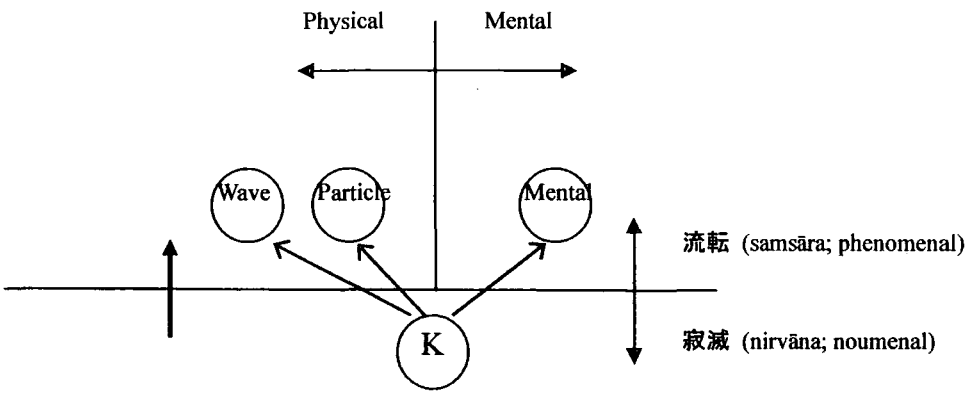
causal connection between physical states and there is no direct causal connection between mental states. Because what we perceive as mental causation and physical causation are explained as pseudo causation, they are something we falsely assume causation to be.

[Fig.6.5.], Bi-epiphenomenalism



So far we have examined the relation between mind and body, but bi-epiphenomenalism is also capable of solving the problems that were addressed in Chapter Five, such as the dual nature of basic elements (section 5.2.1.1) and quantum entanglement (section 5.2.1.3). To consider physical substance to be 空 (śūnya), there is no need to postulate the collapse of wave function. It considers wave and particle nature to be two distinct ways for us to comprehend what we perceive as physical. In other words, what we perceive as physical can be subdivided into understanding as wave and as particle.

[Fig.6.6] Mind, wave and particle.



Wave, particle and mental phenomena are three distinct ways for us to understand one and the same genuine substance, and it explains why there are close co-relations between them and yet they cannot be reduced to one another. They

are mutually exclusive because they follow three different sets of laws and principle. Mental substance is shaped by psychological and social processes. Matter waves follow Schrődinger's wave equation. Particles follow Newtonian mechanics and special relativity theory. What this suggests is related to the Flatlander argument which we saw in Chapter One (section.1.2.1) that what we comprehend is only a limited aspect of reality which forces us to make incorrect assumptions of reality. Wave, particle and mental are not true natures of reality but human perspectives. This opens up a possibility for multi-manifestations depending on perspective and the limitation of a percipient.

Assuming the existence of a single kind of substance is an un-Buddhist-like idea. It contradicts with the idea of 空 (śūnyatā) to affirm the existence of anything in 寂滅 (nirvāna). The idea of mind and body to be fundamentally one and the same thing came from a concept of 気 (ch'i/ki) which is widely employed in many far eastern philosophy and religions. 気 (ch'i/ki) is normally translated as "life force" but it applies not only to animate objects but also to inanimate objects. It is fundamental force that governs everything that exist including both mind and body. The idea of 気 (ch'i/ki) derives not from Buddhism but from Taoism and Japanese pantheism. As it was mentioned in the Introduction, Chinese Taoism and Japanese pantheism had as much influence on Zen as Indian Buddhism did. The idea of 気 (ch'i/ki) was, therefore, incorporated into Zen. Since 気 (ch'i/ki) is understood to be force that govern everything that happens, I will explain and defend the idea of 気 (ch'i/ki) in the next chapter which deals with causation and determinism.

6.4. Conclusion

This chapter looked at the possibility of what we think as fundamental building blocks of universe to be 空 (śūnya). Candidates for genuine substance are mental and physical substance and as we saw in section 3.2.1.1, quantum physics suggests that physical substance to be divided further into wave and particle. The problem is that these candidates are irreconcilable, yet as the mind-body problem (section 6.2.2) and wave-particle duality (section 5.2.1.1)

indicate they are all closely related. This chapter examined plausibility of these candidates and concluded that they are all 空 (śūnyatā). They are all just the ways we perceive substance to be and are not the way substance actually is. This can be related to Chapter Three which dealt with 空 (śūnyatā) of qualitative division. The divisions between mind and body and between wave and particle are 有為 (samskrta) products of human invention useful for sorting out and simplifying what we experience and comprehend. I proposed an solutions of mental substance, the probability wave, and quantum particle to be three different ways of comprehending one and the same underline substance. It is an idea inspired by far-eastern concept of 気 (ki). In the next chapter, I will explore and defend the idea of 気 (ki) in order to clarify what Zen think of mind and body.

7

Causation and determinism

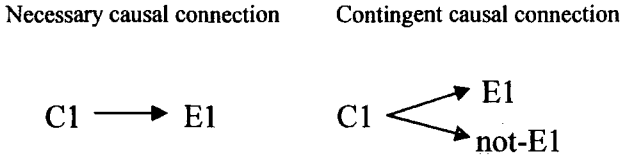
Causation and determinism are popular and the most discussed topics not only in the context of philosophy but also in a much wider context. From ancient times, people have wondered why things happen at all and why things happen this way and not that way. There have been many ideas and theories that aim to provide answers to above the questions. According to Zen, all these theories that claim to answer the questions are 空 (śūnya; empty) and 戯論 (prapañca; erroneous ideas). In other words, what we perceived or comprehend as causation and determinism are 名色 s (nama-rūpas; concepts) that are 空 (śūnya; empty), and they do not reflect the intrinsic nature of 寂滅 (nirvāna; the mind-independet reality). Chapter Five and Six already mentioned some aspects of causation and determinism in contexts of quantum physics and the mind-body [causal] problem. Chapter Five demonstrated the inability of what we perceive as physical causation to explain quantum phenomena. Chapter Six discussed a possibility of both a physical state and a mental state to be epiphenomena thereby they are both causally inert. Since these arguments were mentioned in previous chapters, I can keep this chapter short and precise by referring to other chapters. In order to argue 空 (śūnyatā) of what we understand as causation, this chapter demonstrate the implausibility of commonly held views on causation and determinism. In order to understand the differences between various theories, let us firstly look at what causation and determinism are.

7.1. Causation and determinism

Causation is an act of one event (a cause) which influences or brings about an another event (an effect). There are fundamentally two kinds of causal relations;

necessary and contingent causation. If the relation between a cause (C1) and an effect (E1) is said to be a necessary one, then the occurrence of C1 necessarily entails the instance of E1 (i.e. when C1 occurs E1 cannot fail to happen). If the relation is said to be contingent, even if C1 happens E1 may not occur (i.e. E1 does not necessarily follow C1).

[Fig.7.1.] Necessary and causal causation



In other words, if the relation is a necessary one, then there is only one possible outcome, and the effect cannot fail to happen. Whereas if the relation is contingent, then there are two possible outcomes the effect can happen or not happen.

The distinction between contingent and necessary causation are strongly related to determinism. Determinism is the idea that, without any exception, what actually happens is only what could have happened, and it is not possible for reality to have been otherwise. If all causations are necessary causation, then the world is deterministic, since there is only one possible present state of the universe and there is only one possible state of the future. Whereas if there is even one contingent causation, it leads to indeterminism, since there are two possible future states of the universe as the results of the contingent causation. Causal determinism is related to classics physics. Many people believed the causal deterministic picture of the universe because of the success of Newtonian mechanics. As we saw in the section 5.2.1.2, the discovery of quantum physics, however, changed all that. The tunneling effect, Heisenberg's uncertainty theory and Shrödinger's wave function suggests the classic physics to be wrong. In the light of quantum physics, there are three options regarding causation and determinism. The first one is to maintain causal determinism by supporting hidden valuable theories (section.5.2.2.2.). The second option is causal indeterminism; admitting everything that happens has a cause, but some causations are contingent therefore the world is not deterministic. The third option is non-causal indeterminism, the idea that the world is indeterministic because everything

happens at random and things happen without a cause. Although strict determinism is strongly related to causation, causation is not a necessary part of determinism. In other words, the world can be deterministic without the existence of any causation. It is possible to imagine non-causal determinism of occasionalistic-fatalism that God has predetermined everything that happen and God is a sole cause of everything. According to such a theory there is no actual causation existing between two events which we perceive as a cause and an effect, yet there is only one possible state of the world chosen by God. There is also eastern karmatic fatalism which believes what happens in this life is predetermined by actions in the previous life. I admit that these theories are not non-causal determinism in strict sense. Firstly they are not exactly non-causal theories, because even though there may not be a causal relation between what we perceive as a cause and what we perceive as an effect, there are other kinds of causation, between God or moral conduct in the previous life and what happen in this life. It is also difficult to consider them as determinism, since neither theories conform to the definition of determinism that there can only be one possible state of the world. Especially karmatic fatalism leaves room for us to make conscious decision about whether to carry out or not to carry out certain moral action. The ability to make a conscious decision implies that the possibility for the future to be more than one. Yet, they cannot be recognised as indeterminism, for they do not think everything happens at random in the way non-causal indeterminism of quantum physics suggest. If I may suggest such categories, they are semi-causal semi-determinims. In order to defend the idea of both causation and determinism to be 空 (śūnya), I will demonstrate the above four positions to be implausible.

7.2. Theories of causation and determinism

7.2.1.Karmatic causation

The idea of karmatic causation was widely accepted in Indian philosophies, religions and some branches of Buddhism, but that is not the reason this thesis aims to demonstrate its implausibility. In fact there is no need to disprove karmatic causation since there is no rational reason that support the idea and it had been dismissed as a matter of faith. The motive for disproving karmatic causation

is to eliminate misattribution of the idea to Mādhyamika (中観派) and to Zen. Although many schools of Buddhism accepted the idea of karmatic causation, Mādhyamika and Zen rejected the idea because it was not coherent with 空 (śūnyatā). The aim of this section is to demonstrate how and why karmatic causation is not compatible with Mādhyamaie and Zen.

The word "karma" is well-known even in western culture, but the word itself only means "action" or "action according to motive". What is commonly known as "karma" is actually *karma-niyama* (karmic law). But to make the matter simpler in his thesis I will use the term "karma (業)" in the way commonly used. Karma is specific kind of causation which connects the intended human action and it consequence. It represents an idea that moral acts inevitably entails consequences.

Concepts of karma and rebirth are widely used in Indian religions and philosophy in order to explain the difference and unfairness in the condition or the fortune of people's life. We are trapped in the cycle of birth and death called *bhavacakra* (輪廻; the Wheel of Life) which consists of six[1] modes of existence called *sad-gati* (六道). The six modes of existence are *deva* (天; the gods), *ashura* (阿修羅; titans), *pudgala* (人; humans), *tiryañc* (畜生; animal and insect), *preta* (餓鬼; hungry ghosts) and *naraka* (地獄; creatures in hell). Which mode of existence a person is reborn into is determined by *karma*. *Karma* is an idea that a person with good deeds will be rewarded in the next life to be born in better conditions, whereas a person with wrong doing will be reborn as a lower form of life such as an animal or an insect in a future life.

Although the above idea of karma and rebirth was popular among Indian philosophies and religions, and accepted by some schools of Buddhism, it is a mistake to attribute the idea to Mādhyamika and Zen. They openly rejected karma as 空 (śūnya) based on two reasons. Firstly the idea of rebirth is difficult to be combined with the concept of 無我 (anātman; Non-Self) and 空 (śūnyatā) of 生死 (jāt-marana; birth and death) that were described in the Chapter Four. Many

[1] Among Hinduism and Buddhism, there are different opinions about how many levels or classes of existence. But the Popular Buddhism of China and Japan believe it to be six.

solutions were proposed to make them compatible, but they failed to satisfy the economy of theory, the third criteria I propose to measure plausibility (section 2.2.2). Trying to combine the idea of rebirth and 無我 (anātman) creates unnecessary complications and the philosophically implausibility. It is therefore more reasonable to reject the idea of rebirth as an irrational idea. More importantly, affirming the existence of karmatic causation is against the idea of 空 (śūnyatā). 空 (śūnyatā) states that everything we believe to exist is 幻 (māyā) or 顛倒 (viparyāsa) and it is not intrinsic to 寂滅 (nirvāna). I will come back to demonstrate this point later when I elucidate Zen's position concerning causation and determinism (section 7.3.1).

It is believed that karma and rebirth were included into Buddhism not because they are an essential part of Buddha's teaching but because they were popular concepts predated to the birth of Buddhism. As I mentioned in the Introduction, historically Buddhism developed by absorbing ideas from other philosophy and religions, this was why it was unavoidable for Buddhism to be influenced by the popular idea of karma.

Instead of understanding *karma* as supernatural causation, we can accept it simply as an useful and down-to-earth concept (名色; nama-rūpa) that is 空 (śūnya; empty). It is useful because it makes people behave morally. Such interpretation of karmatic causation was provided by Coward[2] who compared Patañjali's Yoga-sūtra with Freud and Jung. He described karma as "a memory trace recorded in the unconscious by any action or thought a person has done", and defends the idea by giving psychological and neurological explanation as to how past thought and action influences future thought and behaviour. According to him, karma is a causal relation between action and the feeling of guilt or regret, and vice versa. The committing morally wrong action generates feelings of guilt and regret. These feelings of guilt and regret then create the motivation not to repeat the same action in the future. Such interpretation, however, requires further studies, since the psychology of memory has improved from the time of Freud and Jung. Although such study interests me, unfortunately there is no space in this

[2] Coward, Harold G. (1983), "Psychology and karma", in *Philosophy East and West*, vol.33, p.49-60.

thesis to introduce modern theories of memory such as by Tulving[3], Baddeley[4], and so forth. I would like to leave it to my future study.

Althought Zen does not believe in actual karmatic causation that exists between action in the past life and reward or punishment in this life, at least the 名色 (nama-rūpa), a concept, of such causation is a useful instrument to encourage unenlightened people to behave morally and avoid causing harm and suffering. In this sense, it may be possible to accept the 名色 (nama-rūpa; concept), of karma (業) not as a truth but as a mere useful instrument, and is thereby 空 (śūnya; empty).

7.2.2.Causal determinism

Causal determinism derived from the success of classic physics. From empirical evidence available at the time, classic physics made two assumptions; all causations are physical causation and all physical causation are necessary causations. These assumptions lead to a conclusion that all causations are necessary causation thereby the world can only be the way it is and it is impossible for the world to be other than what it is. It is, however, undeniable that some causal relations seem to be contingent, since the same event does not necessarily entail the same effect all the time. Imagine a simple causal connection between striking a match (Cα) and starting fire (Eα). If there is a lack of oxygen, if the match is damp, if the wind is blowing strongly, and so forth, then striking a match (Cα) does not cause fire (Eα). To defend against this sort of example, causal determinism takes a holistic approach; we must consider the state of the entire universe to be a cause of every event. James wrote;

> It [determinism] professes that those parts of the universe already laid down... appoint and decree what other parts should be. The future has no ambiguous possibilities hidden in its womb: the past we call the present is compatible with only one totality. Any other future

[3] Tulving E. (1985), "How many memory systems are there?", in *American Psychologist*, vol.40, p.385-398.
[4] Baddeley, A.D. (1990), *Human Memory*, (Hove, Sussex: Lawrence Erlbaum).

> complement other than the one fixed from eternity is impossible. The whole is in each and every part, and welds it with the rest into an absolute unity, an iron block, in which there can be no equivocation or shadow of turning.[5]

In this way, causal connections between two particular events in isolation may appear contingent, but given the state of the entire universe, there could only be one outcome.

As I listed in the Chapter Five, classic physics failed to explain the wave/particle duality (section 5.2.1.1), quantum uncertainty represented by the Schrödinger's wave function and Heisenberg's uncertain principle (section 5.2.1.2), the tunnelling effect (section 5.2.1.2) and quantum entanglement (section 5.2.1.3). Causal determinism tried to overcome the failures of classic physics by employing an argument proposed by Laplance. Laplance blamed our limited mental capacity and sensory perception to be reasons why some causations appear to be contingent.

> We ought then to regard the present state of the universe as the effect of its anterior state and as the cause of the one that is to follow. Given for one instant as intelligence which could comprehend all the force by which nature is animated and the respective situation of all the beings who composed it – an intelligence sufficiently vast to submit these data to analysis – it would embrace in the same formula the movement of the greatest bodies of the universe and those of the lightest atom; for it, nothing would be uncertain and the future, as the past, would be present to its eyes.[6]

If we had sufficient mental capacity and sensory ability, we would understand everything is causally determined. There are plenty of examples that illustrate the

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[5] James, William. (1897), Burkhardt, F.H. (ed.), (1979), *The Will to Believe; and Other Essays in Popular Philosophy*, (Cambridge, M.A., U.S.A.; Harvard Univ. Press), p.150.

[6] Laplance, P. (1814), *A Philosophical Essay on Probability*, this quote comes from the English translation by Truscott, E. W. & Emory, F. L. (1951), (N.Y.; Dover), p.3-4.

above point. The most well-known example is Maxwell-Boltzmann's kinetic theory of gas. Maxwell-Boltzmann's kinetic theory of gas describes the behaviour of gas particles using probability. Even though each particle behave in causally determined manner, it is not possible for a human being to measure the location and momentum of every particle, therefore the only description we can give is a probabilistic description. In the same way, the hidden variable theories believe that we can only give probabilistic descriptions of quantum phenomena simply because we are not capable of knowing everything that influences the outcome.

Even though causal determinism overcomes failure of classic physics to explain quantum physics, it faces at least two further problems. The first problem concerns the first assumption classic physics made; the assumption that all causation to be physical causation. Throughout Part Three, I argued repeatedly that physicality of 寂滅 (nirvāna) to be 空 (śūnya), i.e. we perceive 寂滅 (nirvāna) to be physical, but 寂滅 (nirvāna) is unlikely to be physical. The wave/particle duality (section 5.2.1.1, 5.2.2.4, 6.2.3, & 6.3.) and the quantum entanglement (section 5.2.1.3, 5.2.2.4, 6.2.3 & 6.3) demonstrated difficulty of considering three-dimensional space to intrinsic to the mind-independent reality. If the three-dimensional physical domain within which physical causation is taken place is 空 (śūnya), then how can physical causation be genuine causation. Moreover, the tunnelling effects (section 5.2.1.2, & 5.2.2.4) and the wave/particle duality (section 5.2.1.1, 5.2.2.4, 6.2.3, & 6.3) indicate what we perceive as physical substance is unlikely to be genuine substance. Since physical causation is normally understood as force that works upon physical substance, if physical substance is 空 (śūnya), then physical causation cannot be genuine causation. These arguments goes against the assumption which causal determinism is based upon. They suggests physical causation, too, is 空 (śūnya). If physical causation is 空 (śūnya), then even what we understand as physical causations are all necessary causation, it does not lead to an conclusion that 寂滅 (nirvāna) is deterministic.

The second problem is that there is no reason other than the success of Newtonian mechanics to support causal determinism. It is normally believed that

causal determinism was supported by the success of Newtonian mechanics, but the process may have been the other way round. The success of Newtonian mechanics inspired the belief in causal determinism. This suspicion can be supported by the fact that causal determinism did not exist before Newtonian mechanics. Before Newtonian mechanics, there were various fatalisms that believed thing happen for reason. As I explained earlier in section 7.1, fatalisms are not determinism in the strict sense, since they did not commit to the idea that the state of the world cannot be anything other than what it is, and there is only one possible future derives from the current state. This indicates causal determinism as we know is only possible in conjunction with Newtonian mechanics. The discovery of quantum phenomena proved that the world is not as Newtonian mechanics describes. Since Newtonian mechanics no longer enjoys empirical adequacy, I believe there is no reason to support the causal determinism at all, other than as a sentiment towards classical physics.

7.2.3. Causal and non-causal determinism

If the success of classic physics inspired causal determinism, the failure of classic physics and the success of modern physics indicate the world to be indeterministic. According to causal determinism, if the condition remains unchanged, regardless of how many times the same experiment is repeated, the outcomes are always the same. Contrary to such expectation, quantum phenomena, such as the double-slits experiment (section 5.2.1.1) and the tunneling effects (section 5.2.1.2) show that even under an identical condition, outcomes vary. Causal determinism blamed our finite mental and sensory capacity for the failure of classic physics to explain why things happen at all and why things happen this way and not that way at the quantum level. On the contrary, modern physics such as Heisenberg's uncertainty principle and Schrödinger's wave function suggests that the failure of classic physics is due to the fact that reality is indeterministic. According to the uncertainty principle and the wave function, even if the condition remains identical there will always be inconsistency in outcomes. They advocate that the difference between what we consider as a necessary connection and what we consider as contingent causation is a degree of probability or

frequency of constant conjunction and there is no necessary causation exists. For example, we believe that unless some other force is working, if I hold a mug and release it in midair, it always falls to the floor. But according to modern physics, there is a possibility for the mug not to fall and afloat in midair. Only reason we do not normally observe such occurrence is because the possibility for that to happen is so diminutive. In order for the mug to float in mid air, not only one particle but the majority of particles that compose the mug must move against gravity. If we suppose that the probability of a single particle to behave against gravitation is 5% and the number of particles required to float the mug is one million, then probability of the mug stay in mid air is $0.05^{1,000,000}/1$ which is almost 0. This is why even if it is possible for the mug to levitate, it is unlike for us to encounter such an occasion. Quantum phenomena and quantum mechanics reveal every causation to be contingent, and that in turn shows reality to be indeterministic.

Regarding causation, there are two possible positions modern physics can take. One is causal indeterminism which believes nothing happens without causation but all causation are contingent. In other words, although it denies determinism, still believes in the existence of causation. The other is non-causal indeterminism which rejects not only determinism but also causation as well. To put it another way, it is an idea that things happen at random and things happen without anything causing them to happen. Those who support the latter provide nucleus decay as evidence for the existence of uncaused event. An unstable isotope or a molecule with a large nucleus discharges radiation by nucleus decay in order to turn stable. Experiments with natural and synthetic molecules prove that even under the identical environment we cannot predict when a nucleus will decay. Nucleus decay can happen within two seconds or ten thousand years. The time it takes for an unstable nucleus to decay is totally at random. It is true that the cause of the decay is its unstable nucleus, but there seems to be no actual cause that triggers the decay at the specific point in time. This suggests that, at quantum level, not every event has a cause, i.e. things can happen without anything causing them to happen.

The problem with indeterminism which modern physics implies is the same

problem faced by causal determinism. The problem is they only consider physical causation to be a candidate for a genuine causation. So that when physical causation turns out to be contingent, they reached an conclusion that the world is causal in deterministic. And when they cannot find physical cause to an event, then they conclude that there is no causation at all. It is, however, possible that there is causation other than physical causation. As I illustrated in section 6.3, physical causation may be physical manifestation and not genuine causation, so that even though an event happened without a physical cause, it does not mean it happened without a cause. As we have seen in the previous section, the mind-body problem, the wave/particle duality, quantum entanglement, the tunneling effect suggests both a physical domain within which physical causation takes place and physical substance upon which physical causation works are 空 (śūnya). If they are both 空 (śūnya), then physical causation must also be 空 (śūnya). As we have seen in the previous chapter (section 6.3), it is more plausible to think that what we perceive as physical causation is just the way we perceive the world to be and it is not the genuine causation. In the next section I will examine the possibility of physical causation to be 空 (śūnya).

7.3. 空 (śūnyatā) of what we perceive as causation

7.3.1. 空 (śūnyatā) of causation

So far I have concentrated on 空 (śūnya) of physical causation. This is because the whole topic of causation and determinism is often regarded separately to mental causation. In this thesis I would like to avoid whole issue of compatibility between determinism and free will since it would take up too much space and it is not main concern in this thesis. What I would do instead is to briefly demonstrate 空 (śūnyatā) of mental causation; implausibility for the mental causation to be genuine causation. If we consider mental causation to be genuine causation, two problems arise. They are the problem of animate/inanimate division and the contradiction to the idea of 無我 (anātman; Non-Self).

Both believes in mental causation and in animate/inanimate distinction

derived from an idea that an animate object is capable of behaving differently from an inanimate object whose behaviour is regulated solely by physical causation, because its behaviour is conditioned not only by physical causation but also by mental causation. The animate/inanimate distinction was mentioned in several places. The Copenhagen interpretation (section 5.2.2.1) and dualism (section 6.2.2.) suggested the existence of such a distinction. For the Copenhagen interpretation, the distinction matches with the distinction between objects capable of collapsing a wave function and objects that are not capable. For dualism; animate objects are composed of two kinds of substance (mental and physical substance) whereas inanimate object consists of only physical substance. Existence of such division was rejected on two basis. One is the claim that was made in the Chapter Three that every qualitative division is 有為 (samskrta), a product of human invention, thereby it is 空 (śūnya). The second is what we saw in section 6.2.2 as objections against dualism. Assuming animate/inanimate distinction to actually exists leading to synchronic, revolutionary and development problems. These suggested that there is no animate/inanimate distinction, so that there is no need for the existence of mental causation which differentiates animate object from inanimate object.

To consider mental causation to be genuine causation contradicts with the idea of 空 (śūnyatā) as well as the idea of 無我 (anātman; Non-Self). Mental causation can only directly interact with one's own body. The only way a mind can interact with anything else is through a physical body. For example in order for my mind to interact with other minds, I have to create sound using my voice box, or writing and typing words using my hands. This implies the subject/object division. The domain where mental causation works directly can be defined as an individual and the domain outside that scope is others or environment. In other words, the mental causation implies an idea of genuine individual (我; ātman). This obviously contradict with the conclusion of Chapter Four that numerical division between self (an individual in a first person sense) and its environment is 空 (śūnya).

Like 空 (śūnyatā) of physical causation that was demonstrated earlier, we

can assume that what we perceive as mental causation is also 空 (śūnya). Zen thinks that what we perceive or comprehend as causal relations are 空 (śūnya), in the sense that they do not exist in the mind-independent reality (寂滅; nirvāna); they are just ways we perceive reality to be.

> The universe viewed as a whole is nirvāna, viewed as a process it is the samsāra. Having regard to causes and conditions, we have the phenomenal world; this same world, when causes and conditions are disregared, it is called the nirvāna.[7]

Loy interprets this as a position that "causal connections are something that we superimpose upon the world we experience."[8] and what we comprehend as causal connection does not exist in the mind-independent reality. Garfield identifies Hume, Wittgenstein, Nāgārjuna and Candrakīrti to share the same idea that causal explanation is grounded on the regularity we perceive and not "a fundamental causal power that causes have to bring about their effects – a necessary connection."[9] He describes the process of founding causation upon regularity as "sceptical inversion[10]". We, the unenlightened, falsely assume that our idea (名色; nama-rūpa) of causation derives from actual causation exists in 寂滅 (nirvāna). But, since we are not capable of comprehending the world as it really is, the actual process is the other way round. Our need to find a pattern and regularity gives rise to the idea of causation and makes us believe in false causation. In other words, not the actual causation but the regularity rises our false belief in causation. We do this because 名色 (nama-rūpa) of causation is a useful tool which enables us to predict and analyse events. We invent 名色 (nama-rūpa) of causation in order to sort out and simplify what we experience and comprehend. Like any other 名色 s (nama-rūpas), causation is, therefore, 有為 (samskrta; a product of human

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[7] *Mādhyamaka Kārīka*, XXV, 9.
[8] Loy David. (1983), "The difference between samsāra and nirvāna", in *Philosophy East and West*, vol.33, p.361.
[9] Garfield, Joy L. (1990), "Epoche and Śūnyatā; Skepticism East and West", in Philosophy East and West, vol.40, p.285-307.
[10] Garfield, Joy L. (1990), ibid. p.292.

invention) and 無自性 (asvabhāva; not intrinsic to nirvāna).

This Zen idea of what we comprehend as causation to be 空 (śūnya) does not, however, directly leads to non-causal indeterminism. As I explained in Chapter One (section 1.3.1), the concept of 空 (śūnyatā) is 中道 (madhyama); the middle way expressed as A and not-A or neither A nor not-A. It is against the concept of 空 (śūnyatā) to see the world in terms of causal or not-causal and deterministic or indeterministic, since such distinctions are applicable only to 流転 (samsāra; the relative reality) and not applicable to 寂滅 (nirvāna; the mind-independent reality). What this means is that Zen only denies the existence of *what we comprehend as causation* in 寂滅 (nirvāna) but it neither affirm nor deny existence of actual causation in 寂滅 (nirvān). To put another way, it is possible that causation actually exist in 寂滅 (nirvān), but such causation is not anything like what we comprehend as causation. Affirming a possible existence of causation of the unknowable kind seems to contradict with the idea of 空 (śūnytā), but it is widely accepted in China and Japan, therefore it is not an alien concept for Zen. As I mentioned briefly in the previous chapter, Chinese Taoist and Japanese pantheism suggests the existence of 気 (ch'i/ki), force that governs the universe and everything that exists within.

7.3.2. 気 (ch'i/ki) and 空 (śūnyatā)

The idea of 気 (ch'i/ki) originated not in Buddhism but in Chinese Taoism and Japanese pantheism. 気 (ch'i/ki) is understood as force or hidden causation that governs everything that happens in the universe. In Japan and China, the way 気 (ch'i/ki) works is described as 道 (Tao; the Way). In other words, 道 (Tao) is the way the mind-independent reality is. It has to be noted that although Japanese sense of 気 (ch'i/ki) derived from Chinese one, there are certain differences between the two. This is due to the fact that when the concept was introduced to Japan, it was combined with a pantheistic view native to Japan. Japanese pantheism denies animate/inanimate distinction and believes in the existence of a force that is common to all objects. Although the idea of 気

(ch'i/ki) naturally fits into this Japanese belief, this made 気 (ki) to be something to be embraced rather than the Chinese sense of 気 (ch'i) which is something we can intentionally alter. Moreover a Chinese idea of 理 (li) as an opposing yet inseparable element from 気 (ch'i) was dismissed in Japan. In order to distinguish the two I will use "ch'i" for the Chinese concept and "ki" for Japanese concept, and when it is applicable to both I use "ch'i/ki".

Despite believing in the existence of a single causation that underline both what we perceive as mental and physical causation seems to contradict with the concept of 空 (śūnyatā), I still believe 空 (śūnyatā) and 気 (ki) to be compatible. I will compare 気 (ki) and 空 (śūnyatā) relating several topics and illustrates the existence of parallel between them, in order to prove that they are not contradicting concepts as they appear to be on surface. The topics I look in are indescribability, mind-body problem, animate/inanimate distinction and 無我 (anātman).

Firstly, according to 空 (śūnyatā), whatever causation or substance that exists in 寂滅 (nirvāna) is indescribable, therefore we cannot neither affirm or negate what genuine causation and substance are. 気 (ki) and 道 (tao) does not contradict with 空 (śūnyatā) because they are considered indescribable. In other words, they are beyond the capability of any 名色 (nama-rūpa) and beyond A and not-A duality. 道徳経 (Tao Te Ching)[11] a text of 道教 (Taoism) which studies the Way (道; Tao) of 気 (ch'i) starts with the following line

道可道非常道

The Tao which can be spoken is not eternal Tao.

This indescribablility of 気 (ch'i) and 道 (tao) makes them compatible with 空 (śūnyatā), but ironically it denies any possibility for me to define exactly what 気 (ch'i/ki) is. I, however, attempt to clarify its meaning as much as I can.

In the previous chapter (section 6.3), as a solution to the mind-body problem,

[11] Traditionally it is believe that the text was written by 老子 (Lao Tzu) around 6th century B.C.

I mentioned mental and physical causation are 空 (śūnya) and they are epiphenomena of the underline causation that is neither physical nor mental. 気 (ki/ch'i) this description. 気 (ki) is understood to be an underline force that governs both mind and body. In China and Japan, this close links between mind, body and 気 (ki) is taken for granted. The links are the foundation of eastern medicine[12] and martial arts[13]. Their understanding of the link did not derive from intellectual understanding but through 体得 (Jp; taitoku), learning through experience without help of intellectual understanding. People found existence of 気 (ch'i/ki) and how it is related to both body and mind through practicing medicine and martial arts. For example a martial artist Ueshiba[14] states that;

> I saw clearly that human beings must unite mind and body and the ki that connects the two and then achieve harmony with the activity of all things in the universe.
>
> ...
>
> By virtue of the subtle working of ki we harmonize mind and body and the relationship between individual and the universe.[15]

The above description fits with arguments for causation to be 空 (śūnya). Firstly, 気 (ch'i/ki) is neither physical not mental but it commands both mind and body. In other words, physical and mental causations are 有為 (samskrta), products of human inventions and there is no such causations exists in 寂滅 (nirvāna). Secondly, despite the above, we can perceive it only as physical or mental causation. Thirdly, 気 (ch'i/ki) is compatible with 空 (śūnyatā) of animate/inanimate distinction. 空 (śūnyatā) of the animate/inanimate distinction has been discussed in many places. Chapter Two argued that all qualitative divisions are 空 (śūnya), so that the animate/inanimate distinction must also be

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[12] Eastern medicine including 鍼 (acupuncture), 指圧 (acupressure; shiatu) and 霊気 (reiki).

[13] Martial arts such as 功夫 (Kong-Fu), 合気道 (Aikido), 気功 (Chi-Gong) and 太極拳 (Tai-chi), all emphasise the importance of 気 (ch'i/ki).

[14] A son of Morihei Ueshiba who is the founder of Japanese martial art, Aikido.

[15] Ueshiba, Kisshōmaru. (1987), *The Spirit of Aikidō*, (Tokyo; Kodansha International), p.24.

空 (śūnya). Schrödinger's cat (section 5.2.2.1) demonstrated that the animate/inanimate distinction the Copenhagen interpretation assumes is absurd and not plausible. The synchronic, the revolutionary and the developmental problems of animate/inanimate distinction examined in the section 6.2.2 as criticisms against dualism illustrated implausibility of such a distinction. The previous section of this chapter illustrated that the distinction between physical and mental causation to be 空 (śūnya). The idea of 気 (ki) agrees with 空 (śūnyatā) that animate/inanimate distinction is a human invention and there is no such distinction that exists in reality. We believe that some different force is working on animate object in order for them to behave differently from inanimate objects. However, according to the idea of 気 (ki), everything including animate and inanimate objects follows the same force and no other force is involved. It is therefore our misapprehension to believe in animate/inanimate distinction. Fourthly, the idea of 気 (ch'i/ki) not being a mental force is also compatible with the idea of 無我 (anātman; Non-Self). According to Taoism and Japanese pantheism, 気 (ch'i/ki) is a force that connects an individual with its environment since it can flow freely between the individuals and between individual and its environment. This is consistent with the fundamental idea of Taoism and Japanese pantheism. In far-eastern arts, medicine, politics, martial arts, harmonising with the existing flow of 気 (ch'i/ki) are important as it is believed that whatever harmonises with 道 (tao; the way 気 (ch'i/ki) flows) can flourish and whatever goes against 道 (tao) would soon perish. By harmonising ourselves with 道 (tao) we can tap into and amplify our 気 (ch'i/ki) beyond our personal limits. How the harmonising and the flourishing is related can be explained recalling the example of the river and the pond. If what we perceive as an individual is a section of flowing river, an individual who defies 道 (tao) is the same as a section of river trying to go against the flow, it creates a turmoil and difficulties. These ideas of 気 (chi/ki) and 道 (tao) are obviously compatible with 無我 (anātman; Non-Self) and 空 (śūnyatā) of numerical division mentioned in the Chapter Four as well as 空 (śūnyatā) of mental causation mentioned in the previous section.

These arguments above indicates that although the idea of 気 (ki) assumes the existence of a single underline causation, it does not contradict with the principle of 空 (śūnyatā). It is in fact 空 (śūnyatā) and 気 (ch'i/ki) are compatible and not a contradicting concepts. To summarise, 気 (ch'i/ki) is an energy or force that governs the universe and everything that exists. 気 (ch'i/ki) is neither physical nor mental in its true nature. Unfortunately, explaining 気 (ch'i/ki) is almost regarded as taboo, thereby I could not provide any literary evidence to support my claim. It is true that many books on martial arts, feng-shui and acupuncture, mention it, but they only discuss how to manipulate or go with the flow of 気 (ch'i/ki) and never explain exactly what it is.

Conclusion

This chapter was set out to argue that both causation and determinism are 空 (śūnya). What we comprehend as causation is not genuine causation that may or may not exist in 寂滅 (nirvāna). Our apprehension of causation is 有為 (samskrta), a product of human invention, and it is 名色 (nama-rūpa). It is 名色 (nama-rūpa) we invent based on constant conjunction, so that we can find certain regularity in order to carry out everyday tasks. In other words, causation is 名色 (nama-rūpa) which is useful but 空 (śūnya) like any other metaphysical concepts we invent. Zen believes the existence of underline causation called 気 (ki). The ideas of 空 (śūnyatā) and 気 (ki) suggest the world to be neither strictly deterministic not indeterministic. Not deterministic, since classic physics which the idea of strict determinism derives from is no longer plausible. It is not inderterminstic neither in the way quantum physics suggests. Because of the existence of underline causation 気 (ki), things does not happen without cause and things does not happen totally at random. Things happen according to causation of 気 (ki) but the causation of 気 (ki) does not imply determinism since there is no reason to believe 気 (ki) to be necessary causation.

Part 4

Practical implication of Zen metaphysics.

8.

Practical implications of Zen Metaphysics

So far we have seen Zen's position in relation to main metaphysical topics. If my interest in Zen were purely metaphysical, then this would be the end of the thesis. But as I stated in Introduction, the motive for me to take up this project was to clarify the underlining Zen metaphysics in order to make sense of otherwise appears to be puzzling, irrational or the illogical nature of Zen. In this chapter, I would like to briefly demonstrate some practical implications of these metaphysical concepts. I must emphasise that this chapter is the indication to my future project and functions as a taster to the potential impacts of Zen metaphysics.

8.1. Implications of 無我 (anātman; Non-Self)

The Chapter Four discussed 無我 (anātman; Non-Self), the idea that all numerical divisions are 空 (śūnya). It was established that all numerical divisions are 有為 (samskrta), products of human invention, and there is no philosophical or scientific basis for numerical divisions between what we consider as self (an individual in the first person sense) and the environment and between things that we consider to be individuals. The practical implication of 無我 (anātman; Non-Self) can be illustrated by the fact that comprehension of 無我 (anātman; Non-Self) naturally brings about 四無量心 (catvāry-apramānāni[1]). The concept of 四無量心 (catvāry-apramānāni) is known as' the *Four Abodes.*' The first is

[1] The same idea is also known as 四梵住 (catvāro-brahmavihārāh).

慈 (maitrī) which means to provide 楽 (sukha; joy) to others. The second is 悲 (karunā); to eliminate or prevent 苦 (duhkha; suffering) of others. The third is 喜 (muditā); not to feel envy and rejoicing in the good fortune of others. The fourth is 捨 (upeksā) is impartiality to treat everyone equally and fairly. Zen believes that when one grasps the concept of 無我 (anātman; Non-Self), he can no longer find any reason to behave aggressively or unfairly towards others, because he realises that an unfair self-centred attitude or having conflicts with others are absurd and pointless. For example, benefiting from unfair distribution of goods by prioritising the self is like my right hand stealing from my left hand. Having conflict with others is like my left hand hitting my right hand. The enlightened do not carry out what we normally consider to be morally wrong attitudes and conducts not because it is against the moral code, but because they would find those attitudes and behaviours to be absurd and pointless. Realisation of 無我 (anātman; Non-Self) not only takes away any reason to be selfish or negative towards others, it gives reason to be kind and caring towards everyone. For those who understand 無我 (anātman; Non-Self), others and self are one and the same thing, so that he can love and care for others in the same way he loves and cares about himself. In other words, those who comprehend 無我 (anātman; Non-Self) would naturally behave kindly to others, and are never abusive, offensive or unfair towards others.

Other metaphysical concepts we looked at can also contribute to the 四無量心 (catvāry-apramānāni). The 空 (śūnyatā) of natural kinds that we looked at in Chapter Three which leads us to realise that there are no actual divisions that define race, community, nationality and so forth. These discriminations are the foundations of all conflicts, racism and war. If we understand there is no objectively legitimate division between races, nationalities, and communities, then there is no conflict of interest, therefore people can live in harmony without causing 苦 (duhkha; suffering) to each other. The 空 (śūnyatā) of qualitative division (Chapter 3), the 空 (śūnyatā) of mental and physical substance (section 6.3) and the 空 (śūnyatā) of physical causation and mental causation (section 7.3.1) lead to the 空 (śūnyatā) of animate/inanimate division, that there is no

difference between human, other animate objects and inanimate objects. When one understands this he can apply 四無量心 (catvāry-apramānāni) not only to fellow human beings but also to everything that exists including other creatures, plants, inanimate objects and the environment. In other words, comprehension of 空 (śūnyatā) makes a person realise being selfish or hostile toward others human, all animate and inanimate objects and environment are absurd and pointless and therefore gives foundation to the motivation towards kindliness and caring equally towards everything including the environment.

Despite what the term of 無我 (anātman; Non-Self) suggests, Zen ethics is not a denial of self but is an expansion of self. In Zen, love and care toward self, others and everything that exist are all equally important. It does not prioritise one over another. This is the idea called 自利利他 (svārtha-parārtha[2]; benefit of self is other) and is considered to be the ideal state in Mahāyāna Buddhism (大乗仏教). Zen believes love and care of the entire universe must start with love and care of self. Love and care of the self means taking good care of oneself by a having healthy lifestyle and diet, and not abusing one's own body and mind. Once one has managed to look after himself, then he can expand the same degree of love and care toward the immediate environment and whoever is close to him, such as close friends and family. If that is again successful, then he could expand the same degree of love and care towards the wider society and the environment. Zen believes in this expansion of love and care of the self, because if one cannot take good care of himself, he cannot take care of other people and his environment. One has to start with something that is manageable. From a practical point of view, this is an effective method. If one tries to take care of wider society and the environment, he is destined to fail the task, and as a result he would be disappointed and dispirited to take care of others and the environment. Suppose there are 400 people in a particular society which includes 50 people who are interested to live according to Zen ethics. It is extremely difficult, if not impossible, for a single individual to employ the same degree of love and care that he employs to himself, toward all 400 people. It is, however, possible to apply the

[2] 自利 (svārtha) means benefit for oneself and 利他 (parātha) is benefit for others.

same degree of love and care of self toward just eight people who are his immediate friends and family. If each one of all fifty people succeeded to take care of eight people, all 400 people in the society would be well looked after. Whereas with the first method, all fifty people failed to achieve the way of Zen.

8.2. 空 (śūnyata) of qualitative division and moral codes

Chapter Three established the 空 (śūnyatā) of qualitative divisions. What we comprehend as qualitative divisions do not exist in 寂滅 (nirvāna; the mind-independent reality), instead, they are 有為 (samskrta) that reflect human values of preference, convenience and social consensus. Zen thinks the qualitative division between morally right and wrong should also be 空 (śūnya). The idea that there is no definite division between right and wrong was expressed in *Dharmapada*[3] and *Suttanipāda*[4]. In both texts, Buddha was defined as one who eliminated (or exceed) the division between *papā* (悪; moral wrong) and *punya* (善; moral right). As we saw in the Chapter Three, realist theories failed to defend the idea that qualitative identity is defined by objects themselves and not by us. In the same way, it is difficult and implausible to imagine that all morally right actions exemplify the one and the same universal, or share an essential property in common or have an overall similarity or a network of similarities.

The idea that the qualitative division between right and wrong is 空 (śūnya) and the existence of moral codes and rules in Buddhism seem to contradict with each other. In Buddhism, there are 四摂法 (catvāri-samgraha-vatūni; four moral conducts) [5] 五戒 (pañca-śīla; five precepts) [6], 律 (vinaya) and other moral codes and rules. How can one deny the qualitative division between right and wrong and yet accept moral codes and rules that define the qualitative

[3] *Dharmapada*『法句経』, 39.
[4] *Suttanipāda*, 520.
[5] 四摂法 (catvāri-samgraha-vatūni; four moral conducts) comprise with comprise with 1) 布施 (dāna; generosity), 2) 愛語 (priya-vadyatā; kind wards), 3) 利行 (artha-kriyā; to think of not only own benefit but also others) and 4) 同事 (samāna-arthatā; sympathy).
[6] 五戒 (pañca-śīla; five precepts) consists of 1) 不殺生戒 (not kill or harm living being), 2) 不偸盗戒 (not take what is not rightly yours), 3) 不邪淫戒 (avoid sexual misconduct), 4) 不妄語戒 (abstain from false speech) and 5) 不飲酒戒 (not take alcohol).

division? The answer may be found in the idea of 空 (śūnyatā). Like everything else, morally right and wrong are 名色 s (nama-rūpas), tools according to which we can divide the world in order to simplify what we experience and comprehend. In other words, Zen considers moral codes and values to be merely tools to encourage people to behave. The following story of Tanzan illustrates this point.

= Muddy Road =

Tanzan and Ekido were once travelling together down a muddy road. A heavy rain was still falling

Coming around a bend, they met a lovely girl in a silk kimono and sash, unable to cross the intersection.

"Come on, girl," said Tanzan at once. Lifting her in his arms, he carried her over the mud.

Ekido did not speak again until that night when they reached a lodging temple. Then he no longer could restrain himself. 'We monks don't go near females,' he told Tanzan, 'especially not young and lovely ones. It is dangerous. Why did you do that?' I left the girl there,' said Tanzan. 'Are you still carrying her?'[7]

This is an example of how the qualitative division between right and wrong is defined with a practical implication in mind. It is considered morally wrong for monks to have any physical contact. But Tanzan understood the purpose of the moral guideline (not to have physical contact with a member of opposite sex) is to save monks from falling into temptation. Since his action would not lead him to temptation, Tanzan acted against the moral guideline.

The moral codes and rules that exist in Zen are useful tools for the unenlightened. As I expressed in the previous section (section 8.1), once the person comprehends 無我 (anātman; Non-Self) he does not require any reason to carry out 四無量心 (catvāry-apramānāni). On the contrary, for the unenlightened who have not comprehended 無我 (anātman), these behaviour do not come

[7] Reps, Paul. (1957), *Zen Flesh, Zen Bones*, (London; Penguin Arkana), p.28

naturally, so that they require moral codes and guidelines. As I expressed in Chapter Seven (section 7.2.1), karmatic causation cannot be used to encourage the unenlightened to follow 四無量心 (catvāry-apramānāni). So only possible way for the unenlightened to follow the way of the enlightened is by illustrating the absurdity of their action. There are many examples of how the enlightened Zen masters gave help and opportunities to those who behave wrongly. I will give two well-known examples;

=The Thief Who Became a Disciple=

One evening as Shichiri Kojun was reciting sutras a thief with a sharp sword entered, demanding either his money or his life. Shichiri told him : 'Do not disturb me. You can find the money in that drawer.' Then he resumed his recitation. A little while afterwards he stopped and called : ' Don't take it all. I need some to pay taxes with tomorrow.' The intruder gathered up most of the money and started to leave. 'Thank a person when you receive a gift,' Shichiri added. The man thanked him and made off.

A few days afterwards the fellow was caught and confessed, among others, the offence against Shichiri. When Shichiri was called as a witness he said : 'This man is no thief, at least as far as I am concerned. I gave him the money and he thanked me for it.'

After he had finished his prison term, the man went to Shichiri and became his disciple.[8]

=Right and Wrong=

When Bankei[9] held his seclusion weeks of meditation, pupils from many parts of Japan came to attend. During one of those gatherings a pupil was caught stealing. The matter was reported to Bankei with the request that the culprit be expelled. Bankei ignored the case.

Later the pupil was caught in a similar act, and again Bankei

[8] Reps, Paul. (1957), *ibid.* p.49.

[9] 盤珪永琢 (Bankei-Eitaku) (1622-1693) Japanese priest in 臨済宗 (Rinzai School of Zen).

> disregarded the matter. This angered the other pupils, who drew up a petition asking for the dismissal of the thief, stating that otherwise they would leave as a body. When Bankei had read the petition he called everyone before him. 'You are wise brothers,' he told them. 'You know what is right and what is not right. You may go somewhere else to study if you wish, but this poor brother does not even know right from wrong. Who will teach him if I do not? I am going to keep him here even if all the rest of you leave.' A torrent of tears cleansed the face of the brother who had stolen. All desire to steal had vanished.[10]

In the above cases, culprits changed their behaviour, not because they were compelled or they feared punishment. They changed their behaviour because they understood the negative implications of the ways they behaved, and decided *themselves* that they would no longer behave in such a way. Zen believes that the motive to change behaviour must come from within, the change has to be sincere and voluntary. If one is forced or compelled to behave in one way, then, when there is no obligation or the presence of watchful eyes, the person would not behave in the same morally right way. To make people behave in the way of the enlightened all the time they have to sincerely understand why they behave in one way (being kind and caring) and not the other (stealing, being nasty to others).

What this section indicated was the 空 (śūnyatā) of the qualitative division between what is morally right and wrong, but the division between right and wrong is a 名色 (nama-rūpa), a tool useful for the unenlightened.

8.3. 気 (ki) and harmonisation with the universe

Although the 空 (śūnyatā) of time and space do not have a direct application to our everyday life, as we saw in Part Three, it leads to the 空 (śūnyatā) of mental and physical substance (the Chapter Six) as well as the 空 (śūnyatā) of causation and determinism. The 空 (śūnyatā) of substance and causation creates

[10] Reps, Paul. (ed.) (1957), *Zen Flesh, Zen Bones*, (London; Penguin Books), p.49.

the possibility for the existence of 気 (ki). This is fundamental to far-eastern philosophy, medicine and the martial arts. Far-eastern philosophy, medicine and martial arts are not often taken seriously because they rely upon the concept of 気 (ki), the force in which western philosophers do not believe exists. In the west, such causation is not taken seriously, because western philosophy generally think causation to be either physical or mental. By demonstrating the possible existence of 気 (ki), I hope in future that far-eastern philosophy, medicine and martial arts may be taken seriously. I believe far-eastern philosophy, medicine and martial arts have much to offer to western culture. By indicating the possibility of 気 (ki), I hope it becomes less difficult for western people to accept this far-eastern knowledge.

8.4. Conclusion

Let me summarise the practical implications of the various metaphysical ideas I looked at in this thesis. The comprehension of 無我 (anātman; Non-Self) encourages a person to be kind and caring equally towards fellow human beings, other creatures, plants, inanimate objects, and discourages him to be abusive, offensive or unfair toward others and the environment. The 空 (śūnyatā) of qualitative division has many implications. Some I examined in this chapter were, the 空 (śūnyatā) of moral right and wrong, the eradication of racism and conflicts between social groups, making people to be compassionate equally towards animate and inanimate objects, the 空 (śūnyatā) of the mind/body division. The 空 (śūnyatā) of causation and determinism rejected karmatic causation. The 空 (śūnyatā) of mind/body division implied, 無我 (anātman), the 空 (śūnyatā) of animate/inanimate division, and therefore the possibility of 気 (ki).

As I explained, this chapter is a brief taster of my next potential project, to study the practical implications of Zen metaphysics. I included this chapter to demonstrate the impacts Zen metaphysics has on Zen ethics.

Conclusion

Let me clarify again the aims of this thesis to see whether I have fulfilled what I set out to achieve.

Aim 1: To make Zen accessible to western philosophers.
Aim 2: To clarify the Metaphysical position of Zen.
Aim 3: To prepare myself and the reader for the attainment of enlightenment by refuting the existing metaphysical views.

In the Introduction and in Chapter Two I expressed the aims of this project and why I chose them. This thesis set out aiming to make Zen accessible to western philosophers. The motive for me to take up this project was my realisation that despite the fact that Zen offers interesting and valid accounts of diverse topics in philosophy, it has been mainly studied under a confined category of eastern philosophy. Zen is treated in this way, because it suffers from the misapprehension that Zen is an illogical and irrational mysticism. My project is to remove such misapprehension and to make Zen accessible to western philosophers so that in future Zen ideas are studied not only in a narrow category of eastern philosophy but also in other branches of philosophy such as ethics, political philosophy, philosophy of language, philosophy of mind and so forth.

In order to achieve the Aim 1, I rejected widely used traditional approaches (literally study and comparative study) and employed a unique method. The difference between my method and the traditional approach can be clarified by dividing philosophy into two parts, the idea and the argument that supports the

idea. Literal study is often used to defend the author's interpretation of Zen by comparing his idea and argument with ideas and arguments found in past literature. Although such an approach gives a deep understanding of Zen, it is not appropriate for the aim of this thesis. This is because the past literature referred to are texts in Indian philosophy and/or Buddhism. This makes Zen inaccessible to western philosophers who are not familiar with eastern philosophical texts. The second traditional approach is the comparative study which tries to find similarities and parallels between Zen ideas and arguments on the one hand and western ideas and arguments on the other. The problem of this approach is that the Zen it presents tends to be the Zen of past literature. Not many comparisons were made between modern Zen literature and western philosophy. Moreover, I strongly believe that if the Zen idea is plausible then it should be able to stand on its own feet, and there is no need for it to be compared to existing western ideas in order to illustrate its plausibility. This is why I employed the method of defending Zen ideas using established western arguments. I got rid of the Zen arguments to see whether I can come to the same conclusion through arguments from western philosophy. In other words, I aimed to reach eastern ideas from western arguments. For example, I defended the idea of 無我 (anātman; Non-Self) without mentioning 縁起 (pratītya-samutpāda; mutual dependence) and 五蘊 (five skandha; five aggregates of an individual). I defended the idea by demonstrating the difficulty and implausibility of believing a definite numerical identity and arguing against western theories such as substratum theory and sortal dependency theory. This made Zen's metaphysical position more comprehensible to western philosophers as well as proving the plausibility of such an idea without relying on compatibility with traditional Zen arguments.

Zen has many aspects which were considered for the purpose of this exercise but this thesis has concentrated purely on the metaphysical aspect of Zen. Zen metaphysics was chosen since I believe it is not possible to understand other aspects of Zen without understanding its fundamental view of the world. In fact what appear to be the irrational and illogical behaviors and statements of Zen masters make sense once Zen metaphysics is understood. To clarify Zen's metaphysical position, I utilized the concept of 空 (śūnyatā) which is regarded as

a core concept of Zen and Mādhyamaka. This was the second aim of this thesis; to reveal Zen metaphysics in term of 空 (śūnyatā). In order to clarify the metaphysics of Zen, the Part One was dedicated to the explanation of 空 (śūnyatā). 空 (śūnyatā) expresses the idea that everything we experience and comprehend is 幻 (māyā; illusion) and 顚倒 (viparyāsa; misapprehension), so that whatever we experience and comprehend is 有為 (samskrta; a product of human invention) and 無自性 (asvabhāva; not intrinsic to 寂滅 (nirvāna; the mind-independent reality)). Once I established what 空 (śūnyatā) is, then the rest of thesis examined the applicability of 空 (śūnyatā) to fundamental topics in metaphysics to see whether Zen metaphysics is or is not plausible. Part Two explored 空 (śūnyatā) of the divisions according to which things are judged to be the same or different. More specifically Chapter Three looked at 空 (śūnyatā) of what we comprehend as natural kinds, in order to demonstrate the 空 (śūnyatā) of qualitative division. Chapter Four analysed the 空 (śūnyatā) of numerical division which directly relates to the idea of 無我 (anātman; Non-Self). What these two chapters have shown was the judgement of being the same or different is relative to our human values and there is no definite sense of being the same or different. The thesis evaluated the 空 (śūnyatā) of time and space in Chapter Five. The idea of 空 (śūnyatā) suggests spatio-temporality is just the way we perceive reality to be without 寂滅 (nirvāna; the mind-independent reality) actually being spatio-temporal. I defend this possibility using modern physics which proves that if there are anything that can be called space and time in 寂滅 (nirvāna), they are not like anything we think of as being space and time. Chapter Six dealt with the question of what is or are the substance or the fundamental building blocks that compose reality and everything that exists. Classical philosophy proposed mental and physical substance to be candidates for genuine substance. Quantum physics suggests that the candidates for fundamental elements are the probability wave and the quantum particle. By introducing the idea of 空 (śūnyatā) and 気 (ki), I proposed a solution that what we perceive as mental substance, physical substance, the probability wave and the quantum particle are just way we perceive things to

be and they are not genuine substance. Chapter Seven looked at causation and determinism and concluded that 気 (ki), the underline causation, is neither a mental nor a physical causation. This leads to the understanding that what we consider as causation and determinism are 空 (śūnya). The universe is not deterministic in the sense of there is only one possible state of the universe, but at the same time it is not indeterministic as if things happen in a totally random manner.

The third aim of this thesis is to prepare myself and the readers to attain 悟 (bodhi; the enlightenment). 悟 (bodhi) is truly realising that everything we experience and comprehend is 幻 (māyā; illusion) and 顚倒 (viparyāsa; misapprehension). According to Zen, such understanding enables us to make peace with our experience and knowledge that do not correspond to 寂滅 (nirvāna; the mind-independent reality) as well as it liberates us from 苦 (duhkha; suffering). As I explained in Chapter Two, the only way to attain 悟 (bodhi) is by carrying out the reasoned refutation of all existing metaphysical views. This was why it was important to deny all existing views regarding the main metaphysical topics such as qualitative and numerical identity, time and space, substance and causation. I hope I sufficiently proved all these existing metaphysical beliefs to be 空 (śūnya), so that the thesis enabled myself and the reader to be ready to take the next step, the attainment of 悟 (bodhi). Because of the nature of 空 (śūnyatā), it is not possible to make a positive affirmation about what the metaphysical view of Zen is. This was why the thesis used 帰謬論法 (prasanga) which is a method of disproving rivalling ideas and doctrines by showing how their premises lead to undesirable and implausible conclusions. Such a method suited the third aim of this thesis, that is to reject existing metaphysical theories by demonstrating their implausibility.

I believe that I have achieved all three aims in this thesis. I have clarified the metaphysical view of Zen in a manner comprehensible to western philosophers and proved the implausibility of existing metaphysical views that claim to describe mind-independent reality.

In order to prove that Zen is a coherent system of philosophically plausible

thoughts, the thesis covered diverse metaphysical topics. Regrettably, because of the word limit of Ph.D. thesis, I could not cover each of these topics in depth. I especially regret not carrying out 帰謬論法 (prasanga) against various theories in philosophy of language when I defined 空 (śūnyatā), 名色 (nama-rūpa) and 中道 (madhyamā). At the time I thought the meanings of these concepts would come clear in the course of the thesis. However unfortunately they did not become as clear as I would have wished.

The project I took up in this thesis is the first of three potential projects I have in my mind. The next potential project is to explain how the metaphysical view of Zen shapes Zen ethics. This I briefly illustrated in the Chapter Eight. I would like to expand it further to clarify Zen's position regarding ethics. An additional project could be related to the application of Zen metaphysics and ethics to the fundamental understanding of eastern martial arts. Obviously ethics is a crucial factor in the study of martial arts in order to prevent the abuse of power. Zen metaphysics offers a framework by which the underlining power of 気 (ki) can be united and utilised in the move towards harmony in mind, body and environment.

Let me finish this thesis by providing explanations to the opening parables I started this thesis with.

> = The moon cannot be stolen =
> Ryokan, a Zen master, lived in the simplest kind of life in a little hut at the foot of mountain. One evening, a theif visited the hut only to discover there was nothing in it to steal. Ryokan returned and caught him. 'You may have come a long way to visit me,' he told the prowler, 'and you should not return empty-handed. Please take my clothes as a gift.' The thief was bewildered. He took the clothes and slunk away. Ryokan sat naked, watching the moon. 'Poor fellow,' he mused, 'I wish I could give this beautiful moon.'[1]

[1] Rep, Paul (ed.) (1957), *Zen Flesh, Zen Bones*, (London; Penguin Books Ltd.), p.23

= Nansen cuts the cat in two =

Nansen saw the monks of the eastern and western halls fighting over a cat. He seized the cat and told the monks: 'If any of you say a good word [give an immediate expression of his Zen], you can save the cat.' No one answered. So Nansen boldly cleaved the cat into two pieces.

That evening Joshu returned and Namsen told him about this. Joshu at once removed his sandals and, placing on his head walked out. Nansei said : 'If you had been there, you could have saved the cat.'[2]

There can be two reasons as to why Ryokan gave away his clothes to the thief and still wished he could have given more. Firstly as we saw in Chapter Three and Eight (section 8.2), there is no moral right and wrong in Zen. Therefore he did not judge the thief's action. Secondly the concept of stealing implies existence of two distinct individuals; a victim and a offender. This obviously opposes the idea of 無我 (anātman; Non-Self). For Ryokan there was neither a victim nor a offender, therefore the act of stealing made no sense to him. There was no individual whose possession was taken from and there was no individual who stole from the former. Nansen's cat is related to ineffability of ultimate truth and 無我 (anātman). The Joshu's act of placing his sandals on his head signified the impossibility to express supreme knowledge and the silliness of Nansen's request to describing the indescribable. Nansen, therefore, expected an answer to his question to be absurd and non-sense. He made a ridiculous threat to show the foolishness of fighting over the cat which did not belong to anyone in the first place. But none of his students, other than Joshu, got the irony of the statement he was making. Therefore, he ended up chopping the cat in half.

[2] The story was recorded in 無門関 (Gateless Gate). this exact passage is quoted from Rep, Paul (ed.) (1957) *Zen Flesh, Zen Bones*, (London; Penguine Book Ltd), p.105

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Glossary

Definitions I present here are how Ch'an/Zen use these terms, therefore there are some inconsistencies between definitions I present here and how original Sanskrit terms are defined.

A

abhidharma	Skt	論	Commentaries of Buddhist teachings.
abhūta	Skt	虚妄	False understanding or misapprehension.
ai-go	Jp	愛語	Japanese translation of *priya-vadyatā*.
ārjīva	Skt	命	Livelihood. 正命 (*samyag- ārjīva*); right livelihood or honest living. The fifth path of 八正道 (*ārya-mārga; eightfold path*).
anabhilaya	Skt	不可説	Indescribable. The idea that truth cannot be put into words.
anātman	Skt	無我	Non-Self. The denial of objective/subjective distinction as well as numerical division between ordinary objects.
anitya	Skt	無常	Impermanence or ever-changing. It is the first of *Trilakṣaṇa*
asura	Skt	阿修羅	Demigod or titan.
arhat	Skt	阿羅漢	The enlightened. The different between *arhat* and *buddha* is that the former attained the enlightenment thought following teachings of another, whereas the latter did so through own effort. Zen believes *arhat* is not truly enlightened one.
artha-kriyā	Skt	利行	To think of not only own benefit but also others. One of 四摂法 (*four samgraha-vastūmi*; four moral conducts).
ārya-	Skt	聖	Prefix which means "noble". Such as ārya-pudgala (noble person) and āraya-satya (noble truth).
ārya-aṣṭaṅga-mārga or ārya-mārga	Skt	八正道	Eightfold Path of how to reach 涅槃/寂滅 (nirvāna). The fourth truth of 四聖諦 (āraya-satya; four noble truth).
ārya-satya	Skt	聖諦	See *catur-ārya-satya*
asamskrta	Skt	無為	Not conditioned or created by human. It is the way reality actually is.
aṣṭaṅga-	Skt	八	Eight; the prefix that denotes number eight
asvabhāva	Skt	無自性	Not being an intrinsic property. An idea that whatever property we assume to exist is projected by us and not reside in an object itself.
ātman	Skt	我	Self, or ordinary individual objects and entities. See *anātman*.
avidyā	Skt	無明	Ignorance. The first of 十二因縁 (twelve pratitya-samutpāda; dependent origination).
āyatana	Skt	処	**1.** Twelve sense spheres; in Buddhist psychology there are twelve āyatana consist of 6 indriyas (6 sense organs incl. mind) and corresponding 6 viṣayas (6 sense attributes). **2.** six places of entry. Counting each combination of sense and object of sensory experience as one, there are six.

B

bhikşu	Skt	比丘	Buddhist monk who cast away all earthly possessions and joined a samgha (Buddhist community).
bhikşunī	Skt	比丘尼	Buddhist nun who cast away all earthly possessions and joined a samgha (Buddhist community).
bhāva-cakra	Skt	輪廻	The Wheel of Life. Continuous cycle of birth and death until the moment of the enlightenment.
bhāvanā-prajñā	Skt	修慧	True realisation. Understanding that arise from within.
bodhi	Skt/P	悟/見性	The enlightenment. Synonyms to pāramitā (to reach the other shore), vimoksa (liberation).
Bodhidharma	Skt	達磨	Indian monk who brought the origin of 禅 (Ch'an/Zen) to China. Many stories that related to him are believed to be fiction.
bodhisattva	Skt	菩薩	The enlightened who delay to reach enlightenment in order to enlightened others.
bon	Jp	梵	Japanese translation of Brahman.
Brahman	Skt	梵	Ultimate reality in Hinduism. According to Śamkara Brahman and ātman are one and the same, thereby forms the concept of Anātman (Non-Self)
buddha	Skt	仏陀	The enlightened; anyone who attained *bodhi* (the enlightenment). It sometime refers Gautama-Buddha who is believe to be the founder of Buddhism.

C

cakra	Skt	輪	Wheel, as in bhāva-cakra.
cakşus	Skt	眼	Eye or visual. Cakşus-indriya; eyes as one of 六根 (six indriyas; six sense organs). Cakşus-vijñāna; vison as one of 六識 (six vijiñāna; six kinds of experience).
catur-ārya-satya	Skt	四聖諦	Four Noble Truths. It is consist of 苦諦 (dukha-satya; life is full of suffering), 集諦 (tṛşṇā-satya; craving cause suffering), 滅諦 (nirodha-satya; it is possible to escape from suffering), 道諦 (mārga-satya; the way to liberate from suffering is through ārya-aşţańga-mārga).
catvāro-	Skt	四	Prefix that denote number four.
catvāro-samgraha-vastu	Skt	四摂法	See *samgraha-vastu.*
catvāry-apramānāni	Skt	四無量心	The Four Abodes; maitrī (to provide joy and comfort), karunā (to eliminate or prevent duhkha), muditā (to rejoice other's fortune) and upeksā (to treat everyone equally).
Ch'an	Ch	禅	A school of Buddhism developed in China around the 7th century. It encourages abandoning all texts and to attain the enlightenment through meditation or direct realisation.
chi	Ch	気	The force that governs everything. In far eastern philosophy, it underlines both mental and physical causation.
chi-e	Jp	智慧	Japanese translation of *prajñā.*

citta	Skt	心	Mind or related to the function of mind.
citnā-prajñā	Skt	思慧	Understanding derives from analytical understanding of the enlightenment.
Chü-chin	Ch	俱胝	Chinese Ch'an monk who cut a boy's finger to help the boy to attain the enlightenment.

D

dāna	Skt	布施	Generosity or giving. One of ṣad-pāramitā (six perfections) and also one of catvāro-samgraha-vastu (four moral conducts)
Daruma	Jp	達磨	Japanese pronunciation of Bodhidharma.
deva	Skt	天	A deity. According to the Popular Buddhism, good deed will be rewarded by being reborn to be devas.
dharma	Skt	法	There are three distinct meanings to the world. **1.** The natural order or law of the universe. **2.** Since the aim of Buddhism is to be in harmony with the natural law, the term also denotes the totality of Buddhist teaching. **3.** One of six viṣayas (attribute of mental experience)
dhātu-loka	Skt	大界	Spheres or domains within samsāra. There are eighteen spheres corresponding to six indriyas (six sense organs), six viṣayas (six kinds of experience) and six vijiñānas (six attributes of experience).
dhyāna	Skt	禅	The original meaning was a state of deep meditation, but the word was translated as 禅 (*Ch'an/Zen*) to inspire the idea of casting away all texts and attaining the enlightenment just through meditation.
dō or dou	Jp	道	**1.** Japanese translation of Chinese Taoist's term *tao*. **2.** Japanese translation of Sanskrit word *mārga*.
Dōgen or Dougen	Jp	道元	The founder of 曹洞宗 (Sōtō school of Zen) in Japane. The author of『正法眼蔵』(Shōbougenzo)
dō-ji or dou-ji	Jp	同事	Japanese translation of a Sanskrit term *samāna-arthatā*.
dṛṣṭi	Skt	見	Views, comprehension and opinion. 正見 (*samyak- dṛṣṭi*); right way or collect way of understanding. One of 八正道 (*ārya-mārga; eightfold path*).
dvādaśa-	Skt	十二	Prefix that denotes number twelve. As in *dvādaśanga-pratītya-samutpāda* (twelve *dependent origination*) or in *dvādaśayatanāni* (twelve entries).
duhkha	Skt	苦	Suffering. Although it is normally translated as "suffering", the concept includes "dissatisfaction". Buddhism thinks it is unavoidable state of *samsāra*. The first of 四聖諦 (*ārya-aṣtaṅga-satya;* four noble truth) and one of 三印 (*tri-lakṣana*; three marks of Buddhist). In Japanese Zen there are eight in total. Four basic duhkha are; 生 (jāti; to be born), 老 (jarā; aging), 病 (illness) and 死 (marana; death). In addition to the above, 怨憎会苦 (to meet somebody one

			hates), 愛別離苦 (parting from loved ones), 求不得苦 (not getting what one desires), 五取蘊苦 (to be attached to self as an individual). Buddhism thinks these *duhkha* derives from ignorance (avidyā).

E

e	Jp	慧	Japanese translation of *pāramitā* understanding.
Eightfold path	En	八正道	See *ārya-mārga (ārya-aṣṭaṅga-mārga)*.

F

furyuu-monji	Jp	不立文字	Indescribable. The enlightenment cannot be attained through words.

G

ga	Jp	我	Japanese translation of *ātman*.
gaki	Jp	餓鬼	Japanese translation of *preta*.
gan	Jp	眼	Japanese translation of *cakṣus*.
gandha-viṣaya		香境	Odour or sent. One of 六境 (six viṣayas; six attributes of experience).
Gautama-Buddha	Skt	釈迦 / 仏陀 / 釈尊 / 釈迦牟尼 /	The person who is believed to be the founder of Buddhism. Gautama refers a name of the clan he belonged to. Before attaining the enlightenment, he was known as Gautama-Siddhartha.
ghrāna	Skt	鼻	Nose. One of 六根 (six indriyas)
gou	Jp	業	Japanese translation of *karma*.
gu-chi	Jp	愚痴	Japanese translation of *moha*.
gunshou	Jp	郡生	Japanese translation of *jantu*.
Gutei	Jp	俱胝	Japanese translation of the name of Chinese Ch'an monk.
gyō or gyou	Jp	行	Japanese translation of *samskāra*.

H

Heart Sūtra	En	心経	The shortened name (last two letters) of 魔可般若波羅実多心経 (Mahā-prajñā-pāramitā-sūtra).
hu-se	Jp	布施	Japanese translation of *dāna*.

I

i	Jp	意	Japanese translation of *manas*.
idampratyayā	Skt	此縁性	Mutual dependence. A synonym to *pratītya-samutpāda*. Nothing has intrinsic property.
indriya	Skt	根	Things from which experience derives. Six indriyas are 意 (mana; mind) and five sense organs. It is part of 十二処 (twelve āyatana; twelve entrires) and of 十八大界 (eighteen dhātu-loka; eighteen spheres).

in-nen	Jp	因縁/縁起	Japanese translation of *pratītya-samtupāda*.

J

jaku-metu	Jp	寂滅	Japanese translation of nirvāna.
jantu	Skt	衆生/郡生	Collective term for living beings. 道元 (Dougen) translated as "miscellaneous beings" including non-living beings.
jāti	Skt	生	Birth. But also the moment when anything come into being or when anything happen. It is the 11th link in 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination).
ji	Jp	耳	Japanese translation of *śrotra*.
jārā-maraṇa	Skt	老死	Jārā (old age) and maraṇa (death). It represents the deepest fear in anyone's life, thereby one of the major 苦 (dukha; suffering). The last link of 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination).
jihvā	Skt	舌	Tongue or of tongue. Jihvā-indriyas; tongue as one of 六根 (six indriyas; six sense organs). Jihvā- vijñāna; taste as one of 六識 (six vijñāna; six kinds of experience).

K

kai	Jp	界	Japanese translation of loka.
karma or karma-niyama	Skt	業	The originally meant "action with intent". But it is a widely used shortened word for karma-niyama (karmatic law) which present the idea that good deep will make one's next life better.
kāya	Skt	身	Body or bodily. Kāya-indriya; body as one of 六根 (six indriyas; six sense organs). Kāya-vijñāna; bodyly sensation as one of 六識 (six vijñāna; six kinds of experience).
ken	Jp	見	Japanese translation of *dṛṣṭi*.
ken-shou	Jp	見性	Japanese translation of *bodhi*.
ki	Jp	気	Japanese translation of Chinese term *chi*.
kōan	Jp	公案	Zen question or statement often referred as "Zen riddles". A question is given to a Zen student in order to prevent his or her mind wonder.
kokuu	Jp	虚空	Japanese translation of *ākāśa*.
kon	Jp	根	Japanese translation of *indriyas*.
kou	Jp	香	Japanese translation of *gandha*.
ksānti	Skt	忍辱	Patience. One of 六渡 (six-pāramitā; six accomplishment); one of things we must have in order to be enlightened.

L

lakṣaṇa or tri-lakṣna	Skt	印 / 三印	Mark / Three Marks. Three marks or characteristics of everything that exist. They are 無常 (anitya; impernanence), 苦 (duhkha; suffering) and 無我 (anātman; Non-Self).

loka	Skt	界	World or universe. In Hinduism and other branches of Buddhism, it is believed that in other lokas gods and devas live. In Zen, the term is used as dhātu-loka to indicate different aspects of samsāra corresponding to different sensory organs and sensory experience.

M

ma	Jp	魔	Japanese translation of *māra*.
madhyamā-ratipat	Skt	中道	The Middle Way. Originally, it indicated the idea the enlightenment can be attained only by the moderate way. In Madhyamaka tradition, it is understood as the idea that truth lies between two extremes. A synonym to *śūnyatā* (A and not-A).
manas	Skt	意	Mind or of mind. Manas-indriyas; mind as a source of mental activity (one of 六根 (six indriyas; six sense organs)). Manas-vijñāna; mental awareness as one of 六識 (six vijñānas; six kinds of experience).
māra	Skt	魔	Devil or demon. Etymologically the term originated in 死 (maraṇa). One who tried to tempt Siddhartha-Gotama is known as 死魔 (Māra-pāpīyas).
maraṇa	Skt	死	Death. As in 老死 (jarā-maraṇa; old age and death). The last link of 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination). One of the strongest source of 苦 (dukha; suffering).
mārga	Skt	道	Way or path which leads to the enlightenment. As in 八正道 (ārya-aṣṭaṅga-mārga; eightfold path).
māya	Skt	幻	Illusion. The idea that whatever we assume to experience and know is *śūnya* (empty). It is not true to the way the mind-independent reality actually is.
mei	Jp	命	Japanese translation of *ājīva*.
mei-shiki	Jp	名色	Japanese translation of *nāma-rūpa*.
moha	Pali	愚痴	Mundane knowledge as oppose to 智慧 (prajñā; the ultimate knowledge).
muga	Jp	無我	Japanese translation of the word anātman.
mujou	Jp	無常	Japanese translation of the word anitya (impermanence). It is the first of *Trilakṣaṇa*
Mumonkan	Jp	無門関	Japanese translation of *Wu-men kuan*.
mu-myō	Jp	無明	Japanese translation of avidyā.

N

Nāgārjuna	Jp	龍樹	Indian Buddhist monk who is believed to found Madhyamika school. His work on śūnyatā strongly influenced Zen.
nāma-rūpa	Skt	名色	Concept. Object or content of mental state.
Nan-ch'uan P'u-yüan	Ch	南泉普願	Chinese Ch'an monk (748-834 A.C.)

Nansen	Jp	南泉普願	Japanese translation of the above Chinese monk Nan-ch'uan P'u-yüan.
ne-han	Jp	涅槃	Japanese phonetic translation of *nirvāna*.
nidāna	skt	因縁	Causal link between condition and effect. In the Popular Buddhism, relations between 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination).
nirodha	Skt	滅諦	The idea that cessation of 苦 (dukha; suffering) is possible. It is the third of 四聖諦 (four catur-āraya-satya; Four Noble truth).
nirvāna	Skt	寂滅/涅槃	The mind-independent reality or the world as it really is, as oppose to 流転 (samsāra). The Popular Buddhism considers it as a some sort of heaven where the enlightenment go and where 苦 (duhkha; suffering) does not exist.
nitya	Skt	常住	Permanence or everlasting. Craving for it generates 苦 (dukha; suffering), because everything is 無常 (anitya; imparment)

P

pañca-	Skt	五	Prefix of number five.
pañca-śīla	Skt	五戒	The Five Precepts. They are 不殺生戒 (not to kill or harm living being), 不偸盗戒 (not to take what is not rightly yours), 不邪淫戒 (to avoid sexual misconduct), 不妄語戒 (not to tell a lie), 不飲酒戒 (not to take alcohol). They matches with samgraha-vastu.
pāramātha-satya	Skt	勝義	Absolute truth. The way mind-independent reality actually is. It composes *prajñā*.
pāramitā	Skt	到彼岸/渡	**1.** 到彼岸; To be enlightened. The literal meaning of the word is "to get to the other shore", implying leaving this world (samsāra) to reach suffering-less world of nirvāna. **2.** 渡; Accomplishment which leads to the enlightenment, as in 六渡 (śad-pāramitā; six accomplishments).
pitaka	Skt	蔵	Collection of Buddhist teachings. 経蔵 (sūtra-pitaka), 律蔵 (vinaya-pitaka) or 論蔵 (abhidharma-pitaka). Collection of three pitaka is known as 三蔵 (tripitaka; three pitakas).
prajñā	Skt	智慧/慧	**1.** The ultimate knowledge, or knowledge available only to the enlightened. The knowledge of the way the world really is. **2.** Mental perfection as in one of 三学 (tisra-śikṣāh; three kinds of things to learn).
Prajñā-pāramitā-sūtra	Sky	般若波羅蜜多心経	One of the most important 経 (sūtra) in Mahāyāna Buddhism. It consists of only one paragraph.
pratītya-samutpāda	Skt	因縁/縁起	Dependent origination. **1.** It denotes the idea of how 苦 (dukha; suffering) derives from 無明 (avidyā; ignorance) through twelve steps (nidāna). **2.** Although it is often understood as "causal connection", in Mādhyamaka school, it

			refers an idea that nothing has intrinsic property. A is depending upon not-A and not-A is depending upon A.
preta	Skt	餓鬼	Hungry ghost or demon. In other branches of Buddhism, it is a state of being as a result of bad deed.
priya-vadyatā	Skt	愛語	To say kind wards to other and not to hart others with words.

R

rasa	Skt	味	Taste. Rasa-vijñāna; one of 六境 (six vijñāna; six attributes of experience).
rigyou	Jp	利行	Japanese translation of *artha-kriyā*.
rin-ne	Jp	輪廻	Japanese translation of *bhāva-cakra*.
Rinzai-shū	Jp	臨済宗	Japanese school of Zen Buddhism founded by 栄西 (Eisai).
ron	Jp	論	Japanese translation of *abhidharma*.
roushi	Jp	老死	Japanese translation of *jārā-maraṇa*.
rūpa	Skt	色	Form or concept.
Ryoukan	Jp	良寛	Japanese Sōtō Zen monk (1758-1931).

S

śabda	Skt	聲	Sound or auditory. As in śabda-viṣaya (auditory attribute); one of 六境 (six viṣayas; six attributes of experience).
ṣad-	Skt	六	Prefix that denote number six. As in ṣad-pāramitā (六渡; six accomplishment)
samādhi	Skt	定/ 禅定	**1.** Balanced state of mind through meditation. One of 六渡 (ṣad-pāramitā; six accomplishment) **2.** The second of 三学 (three śikṣāh; three divisions of 八正道 (eight ārya-mārga; eightfold path)) comprised of 正精進 (samyak-vyāyāma; right effort) 正念 (samyak-smrti; attention) 正定 (samyak-samādhi; right meditation)
samāna-arthatā	Skt	同事	Sympathy. One of 四摂法(four samgraha-vastūmi; four moral conducts)
samgraha-vastu or catvāro-samgraha-vastu	Skt	四摂法	Four moral conducts. It comprise with comprise with 布施 (dāna; generosity), 愛語 (priya-vadyatā; kind wards), 利行 (artha-kriyā; to think of not only own benefit but also others) and 同事 (samāna-arthatā; sympathy).
samjñā	Skt	想	Thinking. 想蘊 (samjñā-skandha); mental state of thinking. One of 五蘊 (five skandha; what we are directly aware of).
samsāra	Skt	流転	1. In this Popular Buddhism, "this world" or "earch" where we live, as oppose to heavens (nirvāna). 2. In Zen, "the relative reality" or "reality as we perceive" as opposed to 寂滅/涅槃 (nirvāna; the mind-independent reality). 3. Three nature of samsāra are 無常 (anitya; impernanence), 苦 (dukha; suffering) and 無我 (anātman; Non-Self).

			Liberating from samsāra is the aim of eastern philosophy and religion.
samskāra	Skt	行	Motive, volition or intention. **1.** 行蘊 (samskāra-skandha); mental state of motive and intention. One of 五蘊 (five skandha; what we are directly aware of). **2.** The second link of 八正道 (eight ārya-mārga; eightfold path); how ill intension or misguided volition bring about 苦 (dukha; suffering).
samskrta	Skt	有為	Conditioned or created. Whatever we assume to experience and comprehend is created or conditioned by us and not the way reality anyway is.
samvtri-satya	Skt	世俗	Relative truth as opposes to pāramātha-satya. Since we are not capable of comprehending reality as it is, we invent truth as social consensus.
samyak-	Skt	正	A prefix that denotes "correct", "right" or "positive". It applied to all eight constituents of 八正道 (eight ārya-mārga; eightfold path).
sangīti	Skt	結集	gatherings of Buddhist practitioners to recite teaching together, in order to compare and correct each follower remember ot understood.
śāntam-nirvāna	Skt	涅槃寂静	There is calmness and peace in nirvāna. One of *tri-laksana*.
sarva-dharmā-anātmānah	Skt	諸行無常	Everything which is *samskrta* is impermanent. One of *tri-laksana*.
sarva-samskārā-anityāh	Skt	諸法無我	The absence of everything we perceive as an individual entity. One of *tri-laksana*.
Sarvāstivāda	Skt	説一切有部 / 説因部 / 有部	An influential school of Buddhism. Unlike Mādhyamaka and Zen, it believes in *svabhāva* (i.e. it took realist's view on phenomena.)
satori	Jp	悟	Japanese translation to *bodhi*. The term is used as a synonym to 見性 and 解脱.
satya	Skt	諦	Truth as in 四聖諦 (four āraya-satya; four noble truth).
sei	Jp	生	Japanese translation of *jāti*.
sesshin	Jp	接心	A period of intense Zen meditation.
shi	Jp	死	Japanese translation of *maraṇa*.
shiki	Jp	色	Japanese translation of rūpa.
shiki	Jp	識	Japanese translation of *vijñāna*.
shin	Jp	心	Japanese translation of *citta*.
shin	Jp	身	Japanese translation of *kāya*.
shi-shoubou	Jp	四摂法	Japanese translation of *samgraha-vastūmi*.
sho	Jp	処	Japanese translation of *āyatana*.
shu-jou	Jp	衆生	Japanese translation of *jantsu*.
sīla	Skt	戒/浄戒	Precepts or moral codes **1.** One of 三学 (three śikṣāh; three things to learn) as well as one of 六渡 (six pāramitā; six accomplishments). It consist of 正語 (samyag-vāc; positive

			use of language) 正業 (samyak-karmāra; right action) 正命 (samyak-ājīva; right livlihood) and 正精進 (samyak-vyāyāma; right intention). **2.** 五戒 (pañca-sīla; five precepts).
skabdha	Skt	蘊	Mental state or what we can be directly aware of. 五蘊 (five skandha) consists of 色蘊 (rūpa-skandha; mental state which correspond with the external world), 受蘊 (vedana-skandha; the mental sate concerning emotional feeling), 想蘊 (samjñā-skandha; the mental state related to thinking), 行蘊 (samskāra-skandha; the mental state that represents motive or will), 識蘊 (vijñāna-skandha; the mental state of awareness or comprehension). All 蘊 (skabdhas) are composed of 名色 (nāma-rūpa; concept).
Sōtō-shū	Jp	曹洞宗	Japanese school of Zen Buddhism established by 道元 (Dōgen).
sou	Jp	想	Japanese translation of *samjña.*
sparśa	Skt	觸	**1.** 觸蘊 (sparśa-skandha); tactile attributes, or attributes from sense of touch. One of 五蘊 (five skandha; what we are directly aware of). **2.** Contact or desire that derives from contact. One of 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination).
śrotra	Skt	耳	Ear or auditory. **1.** 耳根 (śrotra-indriya; ear) One of 六根 (six indriyas; six sense organs). **2.** 耳識 (śrotra-vijñāna; auditory experience). One of 六識 (six vijñāna; six kinds of experience).
śruta-prajñā	Skt	聞慧	Apprehension derives from listening and reading about someone else's experience of the enlightenment.
sūtra	Skt	経	Any Buddhist's text which was originally believed to be words of Gotama-Buddha. A collection of sūtras is known as sūtras-pikata
svabhāha	Skt	自性	Intrinsic nature or property. Mādhyamaka and Zen deny existence of intrinsic property. They think all properties to be samskrta (created or condition by percipient).

T

taitoku	Jp	体得	To learn from experience rather than from intellectual understanding.
tao	Ch	道	The way or true way of nature.
Taoism	Ch	道教	A mixture of religion and philosophy indigenous to China. It is a study of how to harmonise cosmic energy. Its idea strongly influenced the rise of Ch'an/Zen.
tathāgata	Skt	如来	The enlightened or people who comprehend 如 (tathāta; Suchness/the world as it really is). The word can be used as a synonym for 仏陀 (buddha).

tathāta	Skt	如	Suchness or the way the world really is.
tai	Jp	諦	Japanese translation of the word satya, as in 四聖諦 (four āraya-satya; four noble truth).
tei	Jp	定	Japanese translation of *samādhi*.
ten-tou or ten-dou	Jp	顚倒	Japanese translation of *viparyāsa*.
tisra-śikṣāh	Skt	三学	Three things to learn (in order to attain the enlightenment). Three divisions of 八正道 (eight ārya-mārga; eightfold path). They are 戒 (sīla; precepts), 定 (samādhi; right state of mind) and 慧 (prajñā; mental perfection).
tri-lakṣana	Skt		See lakṣna.
tṛṣṇa	Skt	集/愛	Craving. **1.** 集諦; one of 四聖諦 (four āraya-satya; four noble truth). The idea that craving for everything to remain the same (常住 nitya) generates 苦 (dukhal; suffering), because everything is impermanent (無常; anitya). **2.** 愛; the eight link of 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination).

U

upeksa	Skt	捨	Calmness and not being influenced by ego and craving. One of catāry-apramānāni.

V

vāc	Skt	語	Language or use of language. 正語 (samyak-vāc); positive use of language and avoiding lying and slandering.
vendanā	Skt	受	**1.** 受蘊 (vendaña-skandha); mental state of emotion. One of 五蘊 (five skandha; what we are directly aware of). **2.** The seventh link of 十二因縁 (twelve pratītya-samutpāda; twelve dependent origination). Sensory experience causes emotional attachment which leads to craving.
vijñāna	Skt	識	Experience. There are six of them. 眼識 (cakṣus-vijñāna; visual experience), 耳識 (ghrāna-vijñāna; auditory experience), 鼻識 (ghrāna-vijñāna; olfactory experience), 舌識 (jihvā-vijñāna; taste experience), 身識 (kāya-vijñāna; tactility experience or bodily sensation), and 意識 (manas-vijñāna; experience of thought and emotion). They corresponds with 六境 (six viṣayas; six attributes).
vimokṣa	Skt	解脱	Liberation or liberation from 苦 (dukha; suffering) or from 流転 (samsāra). The synonyms for 悟 (bodhi) and 到彼岸 (parāmitā).
vinaya	Skt	律	Buddhist texts that contain monastic codes of conduct and practices. A collection of vinayas is called 律蔵 (vinaya-pikata).

viparyāsa	Skt	顚倒	Misapprehension or seeing opposite of the way reality is. Epistemological scepticism.
vīrya	Skt	精進	Effort or diligence. Effort to pursue correct end is one of 八正道 (eight ārya-mārga; eightfold path) as well as one of 六渡 (six pāramitā; six accomplishments).
viṣaya	Skt	境	Attributes of experience. There are six of attributes. 色境 (rūpa-viṣayas; form (colour and shape)), 聲境 (śabda-viṣayas; sound), 香境 (gadha-viṣayas; smell), 味境 (rasa-viṣayas; taste), 觸境 (sparśa-viṣayas; shape, texture, hotness, coldness, etc.), and 法境 (dharma-viṣayas; mental properties and feeling).They correspond to 六識 (six vijñāna; six kinds of experience).

W

Wei-hin C'ing-yüan	Ch	青原惟信	Chinese Ch'an monk.
Wu-men Huai-hai	Ch	百丈懐海	Chinese Ch'an monk (1183-1260). He wrote 無門関 a compilation of 公案 (kōan).
Wu-men kuan	Ch	無門関	Gateless Gate. A collection of 公案 (kōan) complied by 百丈懐海 (Wu-men Huai-hai).

Z

zou	Jp	蔵	Japanese translation of pitaka.

3

lakṣana or tri-lakṣana	Skt		Three marks. They are 無常 (anitya; impermanence), 苦 (dukha; suffering) and 無我 (anātman)
śikṣā or tisra- śikṣā	Skt	三学	See śikṣā (tisra- śikṣā)
Three divisions of 八正道 (eight-ārya-mārga; eightfold path)	En	三学	See śikṣā (tisra- śikṣā)
Three marks (of samsāra)	En		See lakṣna.

4

ārya-satya (ārya-aṣtaṅga-satya)	Skt	四聖諦	See ārya-satya (ārya-aṣtaṅga-satya)
four noble truth	En	四聖諦	See ārya-satya (ārya-aṣtaṅga-satya)
four moral conducts	En	四摂法	See samgraha-vastūmi (catrāvi- samgraha-vastūmi).
samgraha-vastūmi or catrāvi- samgraha-vastūmi	Skt	四摂法	See samgraha-vastūmi (catrāvi- samgraha-vastūmi).

5

five precepts	En	五戒	See sīla.

five mental states	En	五蘊	See skandha.
pañca-sīla	Skt	五戒	See sīla.
skanda	Skt	蘊	See skandha.

6

āyatana	Skt	処	See āyatana 2.
indriyas	Skt	根	See indriya.
pāramitā	Skt	渡	See pāramitā 2.
six accomplishment	En	六渡	See pāramitā 2.
six attributes of experience	En	六境	See viṣaya.
six sense organs	En	六根	See indriya.
six place of entrance	En	処	See āyatana 2.
six kinds of experience	En	六識	See vijñāna.
vijñāna	Skt	識	See vijñāna.
viṣaya	Skt	境	See viṣaya.

8

ārya-mārga	Skt	八正道	See ārya-mārga.
eightfold path	En	八正道	See ārya-mārga.

12

āyatana	Skt	処	See āyatana 1.
dependent origination	En	因縁/縁起	See pratītya-samutpāda.
pratītya-samutpāda	Skt	因縁/縁起	See pratītya-samutpāda.
twelve places of entry	En	処	See āyatana 1.

18

dhātu-loka	Skt	大界	See dhātu-loka
eighteen sphere	En	十八大界	See dhātu-loka

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