

# **Where are the zombies?**

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# Preface

This is not your typical zombie book.

Zombies depicted in popular movies like “Day Of The Living Dead”, “Night Of The Living Dead”, or other similarly titled ones all have this partially deformed face and this mindless gaze. These slowly walking brain dead flesh eaters are supposed to be unconscious killing machines capable of doing great damage to anyone on their path.

However, this book is not about them.

This book is about another type of zombies.

Think about a medical doctor who, during one of his sleepwalking episodes, performed an accurate diagnosis on his patient, with normal doctor-patient conversation carried out, and then had no memory or recollection of whatever happened afterward (except the handwritten note jolted down by the doctor during the diagnosis). One can argue that the mind of the doctor was not even there when he performed the diagnosis. He was in an autopilot mode without the involvement of his consciousness. When a person is functioning without the involvement of his own consciousness, we have an example of a phenomenal zombie (or philosopher’s zombie).

This is the type of zombies that we are going to talk about.

Despite being unconscious and mindless, phenomenal zombies, if exist, can have properly functioning brains. They may even have very good brains, rivaling those of our smartest. They can think (unconsciously). They can even write poems (unconsciously). They can do everything we can do. The only difference is that they are mindless and are not conscious of what they are doing. It is all signals going around in their brains that are causing all these behaviors.

Here is the question: Can someone with a perfectly functioning brain be actually mindless? If the answer is yes, then we will have to ask, what is the mind for?

According to modern science (specifically, neuroscience), if someone has a normal brain and a properly functioning body, that someone will behave normally, “normal” in the sense that another human cannot detect any abnormality in this individual. So, for all purposes, this someone is a normal human. But in this description, the mind and consciousness never enter the picture. The physical brain, and only the physical brain, is what is important. If this is the case, why aren’t we “sleepwalking” through our life? Sleepwalking in the sense of being in autopilot mode. Why are we conscious? What do we need consciousness and the mind for? Maybe the mind is just an illusion of a

working brain? But we are indeed conscious, and that is no illusion!

What is a mind anyway? What is consciousness anyway?

Is it a little green “self” sitting in the middle of the brain watching all those visual signal the eyes project onto it, hearing those audio signals the ears transmit to it, feeling those itchy signals the skin nerve cells relay to it? If not, who exactly is feeling those feelings?

If your brain is transplanted to a different person’s body, and a different brain is transplanted into your body, will you follow your brain, or will you stay with your body? If your brain is split into two hemispheres, one half transplanted to one body and the other half transplanted to another body, which half of the brain will you follow then? This is the type of questions that make your head hurt, but they are worth pondering because these questions are related to your life and death.

If we want to argue that the mind is just an illusion of the brain, then why do we feel anything at all? After all, the brain is only a piece of meat. How can a piece of meat generate your feelings, and another piece of meat generate mine?

If you understand this question, then you are one of those who understand the famous mind-body problem. If you

don't see the mind-body connection as a problem, then this book will be a surprise to you.

*The mystery of existence*

Indeed, this world is full of mysteries. And the biggest of all is our own existence. The mysterious existence of a conscious mind within each one of us, so that we can be aware of our own existence, is something most of us will be baffled about sometime in our lives.

Look at it this way: you were pulled into this world in human form without your consent, weren't you?

Isn't it a mystery that you got pulled into this world, in this era?

If you have never existed before, why is that when some brain is formed in a womb, you start to gain consciousness? What does that piece of meat that is forming in a womb have anything to do with you, a you that have not yet existed up to that point?

When life is good, we thank for the chance to be alive. Life is so meaningful! Good life is meaningful life. But when life becomes very difficult, some people may actually envy the dead. At least, the dead don't have to suffer the brutality of life as much. "If I just jump off this cliff, it will be much simpler!" A person whose business was completely ruined said to himself, after realizing that

he would never recover because his product accidentally contained too much lead and was forever banned from selling any more products. His life as he knew it as a businessman was ending. The reality facing him was harsh. The pain he was in was acute. If you have been through a lot in life, you know what I am talking about.

Should we be grateful to be alive or should we be resentful of the life we are given (by whom)? No matter how you feel about life, which I am sure will change from time to time, the truth is, you have been pulled into this world without your consent. Whether you like it or not, you are here to live the life you have, prospering or ruined, full of joy or full of sorrow. You are here to witness the events in this world at this moment from your unique point of view. No one except you have your viewpoint from which to look at this world.

No one? Really? But that certainty is increasingly murky if one ponders it further. For example, one may ask if it is possible for someone to be born into your family with the exact same body you were born with but is actually not you? Of course, from your parents' point of view, it is impossible to have it any other ways because for them (and any other third party), you are your physical form. If you are replaced by an identical (I mean really identical, down to atomic level substructure) clone, your parents will never know. They can never know. But from a first person point of view, if your identical clone takes your

place in this world, you will be the first one to know because you will not exist anymore. In fact, you are the only one who knows, the only one who can know. Can you imagine someone else got born into your place, with your exact same body, and you are some place else (or simply don't exist)? Since the beginning of history, people have been born, people have died, and you have never found yourself being one of them until now. Isn't the timing a little bit funny?

Why do we exist now? We feel our existence by feeling something. If the world disappears tomorrow, if we don't have anything to feel, we will not have the sense of time passing. If we don't have the sense of time passing, I don't even know if this kind of existence in pure and absolute stillness is even possible. Even dreaming is always about something. If there is nothing in the dream, a dream is not a dream anymore. Existence without feelings is quite impossible. To feel our own existence, we need to feel something.

In order to feel something, our brains need to process those sensory signals. But how do our brains actually translate those neural signals into something that we can feel? This is the classic mind-body interaction problem. The brain, by being a mere physical object, will generate more physical entities. It will generate more signals. If there is not a little green self sitting somewhere inside the brain, how does those signals get finally converted into

feelings for us to “get it”? What exactly makes this piece of gray matter your brain, whatever it processes, you feel?

If we assume that the material world is all there is, then the answer to “what makes this piece of gray matter your brain” can only come from the material or the structure of the brain, that establishes your identity.

If it is the unique structure of a particular brain that makes it yours, then one has no choice but to conclude that if a brain of this particular structure is constructed, it is your brain. But a simple thought experiment will cast enough doubt into this line of thinking: If somehow your brain gets duplicated, atom by atom, which brain will you find yourself in? Is it true then that when someone put together a brain of this particular structure, you exist? Is it true that when someone put together a brain of this particular structure, you suddenly acquire a viewpoint? But when there are two brains with identical structures, which viewpoint is your viewpoint?

It does not make sense for an individual to have two viewpoints (two brains). So, it cannot be the structure.

Or maybe it is the material?

Maybe it is because when this particular group of atoms in the universe comes together in this way, you exist? If this is the case, somehow your identity has this ghostly linkage with this particular group of atoms even before



you were born? You were pre-destined to be this group of material when they come together in this way. You had a future identity before you were born?

All of these sound ridiculous. But if not, what is it?

So far we have been focusing on the brain. On the other hand, how do we know that the body we have and are so used to is real? Are we sure that we are not inside a dream-like realm, and the brain is really a concept we cook up inside the dream? Even if we are not inside a dream, how do we know we are not in a simulated virtual environment, and we are completely unaware of any outside higher reality because we keeps getting the “proper” signals telling us that we are where we perceive we are? Could we be misidentifying our “virtual bodies” (i.e. our avatars inside the virtual environment) as ourselves, and that the brain is really part of the narrative of the virtual body, and our consciousness, is actually entirely something else?

Is reality really real?

This book is about all these big questions: What is real? What is life? Why do I exist? What makes one piece of ordinary meat “my” brain so that I can feel my existence through it? Is there afterlife?

All these big questions are related to the famous and confusing mind-body problem: how do our immaterial

mind and our material brain interact? Eventually, it is a question about our very own existence, an existence to experience this interaction process, through which we experience life.

The mind-body problem is sometimes called the final frontier in human knowledge, and appropriately so. One day, we may arrive at the so-called “Theory Of Everything” (TOE) in fundamental physics research, figuring out the governing laws of the relationship between the most fundamental stuff there is in the universe and the nature of space time fabric, we may still fail to understand the human mind and the nature of consciousness. With TOE firmly established, giving physics the real foundation to understand everything else, and therefore conceptually, laws in chemistry can be derived from physics, laws in biology and neuroscience can be derived from chemistry and physics, and social science (human behavior as a group) and economics can be derived from biology and neuroscience.....

What a reductionist’s paradise!

However, the mind-body problem is most likely still unexplained. Every other branch of science deals with how the “external” world works. But the mind-body problem is intrinsically “internal”. It is about the mystery of our existence, not as a biological species whose characteristics science can study, but as a feeling

conscious being who has this first person experience and a point of view, whose existence seems mysterious and at times, pointless. Why do we exist to look at this world at all? What for? Can't the world run without us? The world has done so without us for millions of years before we were born. Why do we have to get involved out of a sudden? Even if my physical body (the form) managed to be born, why can't my body work automatically without me "watching" over it? After all, it has a functioning brain.

As a feeling being, our own existence is self-evident. If we don't exist, who is the one who is feeling the feels? However, this cannot be said of other people. Other people could all be zombies. Yes, zombies! Having brains but no feelings inside, like biological robots, like my automatically functioning and sleepwalking body without me watching over it, like my physical body taking care of itself by going to work while I am having a dreamless sleep inside. The brain is all that is required for a biological body to behave "normally", after all.

The concept of philosopher's zombie is an interesting one, and the plausibility intriguing. But we firmly believe that everybody else is just like us, having a brain, as well as having feelings inside. That is why the title of this book: "Where are the Zombies?"

What I am trying to accomplish in this book is to challenge you on your views about life, reality, personal identity (who you are), and on the nature of mind itself. At the end, we will be facing a problem some philosopher coined “The hard problem of consciousness.” To resolve this “hard problem”, I am coming out in support of the Universal Mind hypothesis, with a concrete way of realizing and understanding it. Please fasten your seatbelt and hang on tight...

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## **Prologue - Life as it is**

### *The emotional basis of this journey*

Ever since a person is born to this world, he or she has been put on a path of no return. At the end of the journey, there is a hard stop, beyond which no one has ever been able to see through: death.

Life is just a brief period between birth and death. Yet in this brief period of existence, life is being lived, wars are fought, dreams are fulfilled or broken, accomplishments are achieved, pain of failures and joy of successes are tasted, life long love is developed, sorrow of separation is felt, wealth is accumulated or lost, discoveries are made, ideas are generated, trust is earned, life is lost or saved...

And yet, when the time comes to the point when the heart stops, when the last breath goes out, when the brain goes blank, everything comes to a complete halt. What has been earned is now lost. What has been accumulated is now useless. Knowledge is no more. Memory faded and evaporated. Whatever has been had, is to be lost forever, if not for the first time, would be for the last time.

If one is serious enough about life, and if one is self-conscious enough through this journey of life, he or she will always wonder: What does it all mean? If what is to be had, is eventually going to be lost, what is the purpose



of having in the first place? If the sorrow of death is always awaiting at the end, what is the purpose of being born in the first place? What decides who is born to this world? What decides when one's time has come for him or her to break into this world? Why you? Why me? And why now, in the 21<sup>st</sup> century?

Looking at historical events like the assassination of Julius Caesar, one may ponder what that event means to both the assassinated and the assassin now, long after their death. Their action did change the course of history. The event did change how they lived immediately after. But does it bear any meaning to them at all at this moment? Where ARE they? When we adults look at two children fighting over a piece of candy, we laugh at their ignorance. We would tell them, "Ten years from now, if you both look back, you will realize how stupid your fight was." Only if you know better can you laugh. Only when your psychology is well beyond that level can you laugh. But aren't we adults fighting for similarly insignificant things in our adult life as well? If in the long run, we will all be dead, what is the meaning of our daily struggles? Would you mind the pain of the last ten years if you know the joy of success starts tomorrow? Or you would rather have the glory of past ten years' success, despite knowing failure starts tomorrow?

We all plan for our future, even by sometimes tolerating the extreme painful condition of the present. But if there is no future, what does it all mean to have a plan?

In many ways, what we do in this lifetime is influenced by what we think of our final dismiss, as illustrated in this joke sent to me over the 2007 Christmas holiday:

*Life should NOT be a journey to the grave with the intention of arriving safely in an attractive and well preserved body, but rather to skid in sideways, chocolate in one hand, martini in the other, body thoroughly used up, totally worn out and screaming "WOO HOO" what a ride.*

Wonderful!

Traditionally, religion has provided beliefs for one to feel secure in an insecure world, to feel anchored in a world where everything seems to be drifting, and to feel meaning where life sometimes seems pointless. Religion supplements the finiteness of one's life with a background of infinite existence, which we, through religion, become part of.

However, the great Confucius of China said twenty five hundred years ago, "One doesn't even know what life is, why bother with thinking about death?" Great man he was! But mistaken he was as well. This was his way of avoiding the problem all together. That is why the

philosophy of Confucius does not attempt to tell you the meaning of life. It gives you a set of rules toward how to handle inter-personal relationships. It defines a proper hierarchy structure for a society. This set of rules has shaped the Chinese civilization for the last two thousand years. To a certain extent, it still does.

The reason Confucius could brush aside the problem of death is because his teaching anchors one's identity firmly on his or her family. A person is never an individual, but always the son or daughter of so and so, the grandchild of such and such. By identifying with one's family as an extended self, where one already has a place, and have the family tree propagates into the infinite future, the self is secure. Within an extended self, the self finds meaning. Not unlike one who believes he or she will find a place and meaning in God's heaven.

It seems like human nature requires an extension of the self to carry us through the limit of our life.

No matter whether one is religious or not, however, at each life event, one is again forced to rethink all the assumptions one has made about life. Even high priests or spiritual monks are not immune.

Thus at each life event, questions like, what am I here for, why me, what is the meaning of existence... all get dredged up to the surface. One turns philosophical.

But all these questions are tied to the question of the nature of the mind. Eventually, it is all related to the nature of existence itself. Not the existence of anybody, but the existence of one self who is looking out into the world at this very moment through the point of view of this physical body, as a feeler, as a sufferer, as a joy bearer, and as a conscious mind.

It therefore begs this question: What is a conscious mind?

As a prince, when Siddhartha Gautama, the future Buddha, of India (probably a contemporary of Confucius) first ventured outside of his palace as a young man, he was completely shocked by the suffering he saw in the poor, the sick, the old, and the dead. Looking at the skinny bag of bones of the sick bodies, he realized he would one day suffer the same fate. He would grow old, suffered, and died, just like every other human, no matter who he was. His observation led him to believe that the nature of life was suffering. To not suffer, one has to break this cycle of life and death (re-incarnation was a widely held belief in his time and culture), and to achieve enlightenment. Those who understand the true nature of life are the enlightened ones, the Buddhas. The Buddhists view the mind as fundamental, the material world as illusionary. Not unlike the movie “The Matrix” where reality is an illusion, and there is a higher existence. Though illusionary, we are in it. The mind therefore causes the world to have its appearance. Those who see

through the cloud of illusion will see the true reality. They will achieve enlightenment. With wisdom of seeing through the cloud, one breaks the cycles.

When Buddhism was found twenty five hundred years ago, Siddhartha Gautama did not know about quantum mechanics, not to mention the collapse of wavefunction by the act of observation in the Copenhagen interpretation of quantum mechanics. When we divide matter into smaller and smaller size, eventually we are going to reach a level that they don't behave like regular material in our macroscopic world anymore. Those tinier and tinier material dust will behave more like waves than dust particles. Atoms behave like this, electrons behave like this. All subatomic particles behave like this. Physicists are forced to devise new ways of describing these tiny dust particles' behavior. The mathematical tool is the "wavefunction", and the branch of physics that deals with extremely small materials is Quantum Mechanics, to distinguish it from the macroscopic physics which we now refer to as Classical Physics. Since big objects are built from small objects, quantum mechanics is therefore seen as the foundation of classical physics, which we use in our daily life. On the nature of matter, quantum physics is considered closer to the truth than classical physics has ever been.

The Buddhist's concept of the mind strikes some people as awfully interesting when quantum mechanics seems to

suggest that reality does not have an objective existence without observation. Reality is caused to exist by the very probing action itself, which, presumably is initiated by the mind. Fair to say, the development of quantum mechanics provided an opportunity for the philosophy of the mind of Buddhism to spread to the west, with a new age scientific connotation.

In parallel, despite its difficulty in the light of Newtonian mechanical materialism, Descartes' dualistic view of the mind body relationship also got an infusion of life in the ghostly shadow of quantum mechanics, where the mind is now considered the agent that collapses the wavefunction and brings about the reality, thus avoiding the Newtonian determinism, giving the mind and free will another chance.

As science progresses, as the investigation of the external world and its methodologies advance, the one philosophy that has become prominent and has stood the test of time is materialism. In materialism, material is fundamental. The material brain is the real thing. The mind, just like love, is an abstract concept that can exist in one moment, and gone the next.

But is it? Can mind exist outside of the brain?

A world where the mind causes the illusionary material world to assume its appearance is very different from a

fundamentally material world in which the brain generates the illusionary existence of the mind. If the mind can exist independent of the physical body, the meaning of life will be dramatically different from that in a world where mind is only an illusionary property of the brain.

If the mind is only illusionary, why aren't we all zombies? There is no place, and no need, for the mind in a materialist's world. Sound strange? The question is in fact quite reasonable, as we will see in later part of the book, after we have laid down some foundations in Section I and II. As an interlude, in Section III, we deal with the question of meaning of life. After that, we dive straight into the "Hard Problem" of consciousness. Finally, in Section V, we will discuss a new metaphor of the mind, providing a new mind-brain interaction model. Some short random, and perhaps somewhat religious, thoughts given in Section VI will conclude the book.

# **Section I**

## **The Physical Body**



## **A case for “everything is physical”**

The rise of physicalism/materialism, the belief that everything is physical, materialistic, is a direct result of the rise of modern science and the widespread use of scientific methods.

Despite their divergence in the philosophical view of the world, all scientists employ physicalistic scientific method in their professional life with or without knowing it. It is inconceivable to imagine a biologist would invoke the action of a spirit in explaining the splitting of a cell, for example, while more physicalistic mechanism is not sought after. Or for that matter, a software programmer or a computer scientist truly believes his computer has a mind of its own, and can violate the software instructions it is running. As far as scientific investigation is concerned, we all assume the existence of materialistic explanations and go after them.

This scientific belief stems from the fundamental view in materialism/physicalism that there is an objectively existing world out there, made of material, and material alone. Everything else, including ourselves, is the result of materials moving around and interacting with each other. In the world of contemporary science, there is no place for spirits, souls, or minds. Things that are not physical are not real.

However, in the back of the mind of many people, there is always a lingering feeling that contemporary science may not have provided the full picture, as the then contemporary science of the pre-quantum period did not prepare the physicists for the approaching quantum era. Upon the arrival of the quantum era, new scientific principles and methodologies had to be invented and developed. What was not science before, had been incorporated into the proper scientific regime because of necessity. Illogical concepts like material can be both waves and particles at the same time, despite the fundamental incompatibility of their natures, had to be invented and then accepted. It is therefore fair to ask at this moment, are concepts in science today to be extended in the future to accommodate for consciousness? In line with this type of doubts about the completeness of current scientific concepts and methodology rooted in materialism, one may ask, can materialism, in principle, account for the first person feeling of love? How about thoughts? How about free will? Can the material brain and the physical body really account for all these first-person phenomena?

So, to lay down a convincing case for a materialist's view of the world including ourselves, we have to start with mental phenomena and the brain, because all non mental phenomena are already conceptually explainable inside materialism. We will like to follow materialism and

contemporary science as far as possible. We will like to see where it finally breaks down. Materialism is our foundation, our starting point. However, starting in Section III and IV we will have a complete revision of the materialistic view of the world. We want the ending to be dramatic.

## Examples of “Everything is physical”

### *Example 1, Mental capacity and intelligence*

There are ample evidences supporting a person’s mental capacity is determined by his or her physical brain. We know some people are particularly good at grasping concepts, while some are less so. Some are fast calculators, and some are relatively slow. For some, Einstein’s theory of relativity is beyond their reach. But for some, the problem is a reversed one: They think too sophisticated and too fast in multiple steps that they fail to appreciate how step by step regular folks think, and thus fail to effectively communicate great ideas across. A genius almost appears autistic. Even some just seem to have a good sense of how the beauty of nature can be captured by a simple camera in a particular composure, other are slow to recognize the beauty lay openly in front of them.

We don’t know if our minds are all different, but we do know our brains are. Different people have different mental capacities, or different kinds of mental capacities. We are limited by the physical brain we have. Isn’t this in itself a piece of evidence showing that the physical brain determines the mental capacity of a person? To that I will say, it’s material over mental, matter over mind. One cannot be smarter than the physical brain he/she has.

### *Example 2, Cigarette addiction*

Often addiction is seen as the problem of the weak minds. And yet, we witnessed otherwise strong-minded smokers, one after another, trying to quit smoking and failed, often ended with agony and self-blaming. I knew of two smokers who were very serious about quitting. They went as far as betting each other that if anyone was caught smoking again, he would sit on the photocopier and had a photocopy of his butt (fully clothed) posted on the wall. Three weeks after the bet, I saw both butts on the wall.

We know that there is substance call nicotine in cigarette that is addictive. We also know that once one started smoking, quitting is rare. Can we somehow piece these two factors together? Nicotine changed our brain and our brain changes our behavior. Yes, we have seen people who have quitted successfully. Some believe these people have stronger will to overcome the addiction. But how do we know it is not that their brain is somehow less susceptible to the invasion of nicotine? Is it their will power (which we will for the moment assume to be mental) that counts, or is it their physical brain (the material) that determines the outcome?

Answer to this question came on Jan 26 of 2007 when a group of researchers published their findings in *Science Magazine* titled *Damage to the Insula Disrupts Addiction to Cigarette Smoking* (Vol. 315, no. 5811, pp. 531 – 534).

On Jan 26, 2007, a group of scientists from University of Iowa and University of Southern California reported that an injury to a specific part of the brain, the insula, can instantly and permanently stop the urge to smoke. These patients all had smoked at least five cigarettes a day for two years or more, and sixteen of them said they had quit with ease after the brain damage, losing their cravings entirely. According to the report, these sixteen who had quit easily were far more likely to have an injury to their insula than to any other area. On the other hand, injuries to other regions of the brain, including tissue surrounding the insula, do not seem to diminish the urge to smoke. In scientific language, there is a strong correlation between the disappearance of the urge to smoke (ease of quitting smoke) and the injury to the insula. In plain language, change the insula in your brain, and you can quit smoking easily.

Here we are, injury to the insula in the brain dramatically alter one's addictive behavior toward cigarette, while failing smokers keep blaming themselves for the lack of will power! A physical alteration to part of the brain can bring about a dramatic change in one's craving for cigarettes overnight. Talk about free will!

Of course, there are many ways to bring about physical changes in the brain. Accidental injury is only one of them. Forced biological feedback is another. One can imagine using electrical shock to associate smoking with

painful experience, forcing the brain to make new wiring, so as to dampen the urge to smoke. But once the threat of electrical shock is eliminated, it is not sure if the brain will rewire itself and if the urge will return. Mental exercise can also induce structural change in the brain. The Dalai Lama frequently encourages his monks to participate in scientific study to find out if there are any difference between the brains of ordinary people and those of the monks. Studies reveal that those who meditate a lot are indeed different. In the practice of the so-called Compassion Meditation, long time practitioners show much more gamma wave activities while beginner meditators show only slight increase. In functional MRI brain scan, the activities in the left pre-frontal lobe responsible for positive feelings completely dominate over the area of negative feelings for long time practitioners, while less so for beginners. One can therefore imagine, with the help of mental exercise (meditation, positive thinking, believing in something, etc) one can bring about the changes in the brain that affect the body's behavior. So, if a person takes up a particular religious belief, and is able to see smoking in the new light (mental exercise), it is possible that the person may now view smoking as a sin, and quits smoking successfully. Devoted Buddhists are able to forgo the crave for delicious beef while an ordinary person finds it difficult, I don't see why religion cannot

bring about a change in the brain structure necessary to help one quit smoking.

But all these are external factors that change the brain: New injury, new belief, forced biofeedback, new practice of meditation, etc. Without new external factor, the mind alone can hardly change behavior, thus addiction continues for most people.

Our behavior seems to be a result of our brain structures, not that of the mind. So much for Will Power. It is matter over mind.

### *Example 3, Alzheimer Disease*

Another physical condition that affects mental capacity is the Alzheimer disease. Currently there is no prediction on what types of people will eventually develop Alzheimer disease as they age. In other words, it seems to be a condition that can potentially victimize anyone. The symptoms of Alzheimer disease range from mild forgetfulness to serious memory problem, and confusion about time and place. Serious patients cannot recognize their family members. Critical thinking capability beyond a superficial level is absent. Childish behavior can sometimes be observed in Alzheimer sufferers. Grasp of concept becomes difficult if not impossible. If one is to perform IQ test on a second stage Alzheimer patient, the result must be quite disappointing.



Imagine a Nobel laureate developing Alzheimer's disease. One may be tempted to ask, what has happened to the mind of this great mind? Where has the mental capacity gone? A slight alteration to the structure of the brain can cause such a drastic change in the mental capacity of a person, what will the change in a dying brain do to the mind? Devastating!

Again, it seems to be matter over mind.

*Example 4, Out of body experience*

A group of medical researchers wrote on Nov 1, 2007 in New England Journal of Medicine,

*"We report the case of a 63-year-old man in whom stimulation with implanted electrodes overlying the temporoparietal junction on the right side as a means of suppressing intractable tinnitus consistently induced out-of-body experiences without autoscopy..."*

This 63-year old man was hoping that the electrodes implanted in his brain could help him suppress the unusual noise he heard, a condition of his tinnitus. But when the doctors applied a 3.7V electrical short pulses to the electrodes, five pulses at a time, and repeat that 40 times in a second, he got this out of body experience. He always felt he was 50cm behind his body and to the left. The experience started within one second of the

stimulation starting, and the experience last anywhere between 15 seconds to 21 seconds.

Lowering the voltage to 2.7V, say, did not induce the out of body experience. Changing the pulsing pattern from a group of 5 with 40 groups a second to plain repeating pulses without grouping did not induce the out of body experience either.

In the past, out of body experience had been rare and scientists did not have a good understanding of its origin. It is typically associated with the concept of the soul temporarily leaving the body, thus raising the possibility of a bodiless soul. However, if out of body experience is all because of the brain state, then it is reduced to a mere physical process.

Spiritual experience it is. But now, we accidentally reproduced one condition that can create out of body experience in a repeatable way in a lab environment. Once it was spiritual, is being put back into the physical realm. The experience comes from the brain condition.

Again, it is another case of matter over mind.

#### *Example 5, Homosexuality and brain structure*

Is it that someone's mind that is abnormal that causes homosexuality or it is the brain? In other words, will one who has a seemingly normal brain, by choice or for some

other reason, be sexually attracted to another individual of the same gender?

In some societies, and to some people in all societies, the act of being sexually attracted to people of the same gender is a moral issue. It is considered a deviant mind by some. The question is, does the poor individual have a choice?

Well, Ivanka Savic of Karolinska Institute in Stockholm, Sweden conducted a brain MRI scan study in 2008 and observed some interesting differences between gay and straight people.

In straight men and lesbian, the right brain hemisphere is slightly larger than the left, while in straight women and gay men the two sides are about the same size.

The researcher then used PET scans to measure blood flow to a part of the brain that governs fear and aggression, the amygdala, and they found that in straight men and lesbians, the amygdala fed its signals mainly into regions of the brain that trigger the "fight or flight" response, while in women and gay men, the connections were mainly into regions of the brain that manifest fear as intense anxiety.

It fits perfectly with general behavior observation that in times of danger, straight men can turn agitated and are more ready to fight, while during the course of daily life,

straight women are more prone to anxiety and mood disorder. Incidentally, gay men also have a higher rate of depression like women as well.

It looks like homosexual people are born different. Their brains are born different. They don't have a choice!

As the neuroscience and brain studies advance, more and more human behaviors that are traditionally placed in the domain of spirituality and morality will be proved to be results of the brain function.

We are getting more and more support for material brain over mind, matter over mind.

*Example 6, General anesthesia, the ultimate matter over mind*

Under general anesthesia, a person loses his/her consciousness (responsiveness) to the point that he or she no longer responds to external stimulations. Upon waking up from the procedure, one has some memory of what was in the mind at the moment right before waking up, but not much more. In particular, study has confirmed that upon waking up, patients were not able to recall verbal messages spoken to them when they were sedated. However, it is not sure if the anesthetic process causes a complete loss of consciousness of the patient, or causes him or her to forget about all the experience during the process upon waking up but actually was experiencing it

during the procedure. Whichever case it is, anesthetic drugs cause the brain, and so the mind, to enter an altered state, in which the perception of the outside world is greatly impaired, if not completely blocked. Communication with the outside world is cut and so the evaluation of mental capacity is impossible.

General anesthesia, is therefore considered the ultimate case for matter over mind. You just cannot stay awake no matter how strong minded you are.

Along with effects of other drugs, legal or illegal, some turns people suicidal, some make people feel so good that they come back again and again to get more, and eventually becoming addicted, we have a long list of examples of matter over mind.

I can definitely go on with more evidence such as the impairment of the “danger detection circuit” in the brain after alcohol consumption (as revealed in brain scan study), causing people to engage in riskier behavior under the influence of alcohol, hallucination under the influence of drugs, and etc.. But the point is served: What we have considered the sacred domain of the mind, is now being gradually chipped away into the physical domain when the mechanism in the brain responsible for these behaviors are revealed.

I hope that we now have enough evidence to convince ourselves that we are on a pretty solid ground to assume that every mental phenomenon has a physical reason. Everything is physical.

So, why doesn't physicalism/materialism enjoy unanimous support from all individual researchers in the scientific community? We touched upon this question earlier in the beginning of this section. One thing is clear, inside their professional work, all researchers use physicalistic scientific method, because this is the nature of scientific work. However, in their professional work, most scientists don't deal with the problem of consciousness. Most scientists deal with the "external" world. Even many who study consciousness deal with other people's consciousness (responsiveness), which is external to the researchers themselves. They study other people's consciousness in ways no different from studying the inner working of a machine. Researchers deal with subatomic particles, deal with material synthesis, deal with animals, deal with effect of drugs on other people, deal with viruses, deal with computer systems, with aerodynamics. But very few of them deal directly with the problem of consciousness as they investigate their own subjective experiences. When it comes to philosophical beliefs, especially in the case of personal existence, scientists often find themselves stray too far from their training and profession, and they are

free to choose whatever they are emotionally comfortable with and what their up bringing conditioned them to accept. Outside of their professions, scientists are just like ordinary people. Many stick with materialism, many don't. Those who don't, some have good reasons but some just don't know.

Now that we have seen so much evidence of matter over mind, and brain over spirituality, I hope we are sufficiently convinced that everything we believe to be mental or spiritual, we can always find some physical features in the brain that correlate with that aspect.

If we believe that everything is physical, then we should have no problem with this model of a human body: It is a structure built of atoms, and built from atoms. This model of the human body is indeed a modern scientific view of the human body. It does not contain any other immaterial stuff like the soul, the mind or the living spirit. It is just a plain material body, and material body alone is there to account for the full nature of a living human.

If you are convinced of this human body model, a Lego structure of atoms, then you probably will believe that if we deconstruct a living human being, and reconstructed it with exact same arrangement as its body blueprint, we will get back the same person. In particular, if you happen to be that person, you will not be afraid to

participate in such a de-construction re-construction procedure. You believe you will survive.



## **Are you who you think you are?**

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Here is how the Star Trek transporter is supposed to work:

It scans your body's structural blueprint, atom by atom. It deconstructs your material body and beams the material to the destination, where the receiving end of the transporter reconstructs your body according to the blueprint it obtained during deconstruction

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Everything is physical. So we believe. That means, if we somehow manage to take our body apart, and if we manage to put our body back together in the same way, we will get back ourselves.

One day, you stepped into the transporter on earth, and were ready to beam up to the Starship Enterprise. On board the Enterprise, your family was waiting for you at the transporter waiting room. They came up first on board a van-size shuttle and endured the thirty-minute roller-coaster ride. However, you were trying to avoid the hassle of having to first fly to a spaceport in order to get onto a shuttle, going through all those space security check points, and enduring the 30-minute space ride before you could reach the comfort zone inside the artificial gravitational field on board the Starship Enterprise. So you chose the easy way: The tele-transporter.

So, you stepped onto the transporter platform. It energized. The next thing you knew, you were standing on a similar looking platform, but it was on the Enterprise. Everything seemed all right. But there was just one little problem. The transporter had a little glitch: At the reconstruction end, instead of reconstructing one copy of you from your blue print obtained during deconstruction, the transporter reconstructed two identical copies of you. Oops!

You looked to your right, another copy of you were just looking at you. You thought to yourself, “I did not know I look so s\_\_\_\_\_ (fill in the blank yourself) in real person!” You quickly realized, you were in much greater trouble than just looking s\_\_\_\_\_. You were about to have to share everything you had with another individual from this point on because of the stupid transporter glitch. You also knew that this other individual was thinking about the same thing at the same time. What were you to do? Were you the guy who got beamed up, or was it the other guy that was the original and now had to share everything with you? You said, “Who was re-constructed with the original body atoms?” Well, the matter is not that simple.

Questions generated by the concept of teleporters like this had been discussed by Derek Parfit before. Richard Hanley also discussed some philosophical aspects extensively in his book “Is Data Human”. The scenario described above immediately posts two problems:

1) Can we consider the re-constructed person the same person?

2) What is the first person experience of someone going through this type of procedure? In particular, if I was that person on the platform, and if I “arrived” at the destination and found an identical me standing next to me, will he be standing on the left or will he be standing on the right? That is, which body will I find myself in? And why?

Lawrence Krauss discussed in his book “The physics of star trek” the practical difficulties of the transporter. However, I am not going to worry about the practical difficulties just yet because I have a simpler transporter in mind. I think of a machine that takes one person apart to the atomic level (or just sub-organ level if atomic level proves to be too complicated still) only so that we don’t have to worry about “energizing” the material into quark-gluon plasma or some “pure” energy which is so energy intensive, or to deal with Heisenberg’s uncertainty principle in quantum mechanics, at least not yet.

My plan is to start with a view that human is like a Lego block structure built up by atoms, in the classical Newtonian physics sense. Then I am going to use the transporter concept to deconstruct and reconstruct a human. I am going to end up with some inconsistency, which I will turn around and try to show that

consciousness needs quantum mechanics working in the brain, a view also expressed by Roger Penrose.

Since life scientists are usually not immersed in the quantum regime, I believe the mechanical atomic Lego structure human body view is widely held among life scientists. I have not found quantum mechanics being applied anywhere in biology so far. So, a classical (non-quantum) mechanical view (i.e. the Lego block like atomic structure) of the human body is consistent with the current scientific view in the field.

Imagine if such teleportation is possible someday, would one risk being “killed” at the deconstruction platform while contemplating your “clone” (if your atoms were partially or fully replaced by identical atoms from somewhere else) reconstructed at the receiving platform taking over your properties, your spouse and your children? Or maybe it is really “you” who get reconstructed at the destination platform? How would you know? Does it matter whether the atoms from your original body are used for the reconstruction? If someone can be reconstructed atom-by-atom from a blueprint, what is going to happen to the continuous stream of consciousness of that person, from the first person perspective (why the first person perspective is unique will become clear later in the book)? What does it say about the true nature of consciousness and personal identity?

One can think of the transporter as an extreme 3-D printing machine. 3-D printers are already in use in industrial prototyping today. A 3-D printer prints material layer by layer. As the layers stack up, a volumetric object is created. You can make a plastic cup out by 3-D printing directly out of a CAD model. If you can draw it, they can print it. In the transporter, you need atom-by-atom manipulation capability. And atom-by-atom manipulation capability we already have. Atomic Force Microscope (AFM) can manipulate atoms on a surface, even though its manipulation capability is quite limited. It is slow. But the point is, we can already move atom one at a time. There is no conceptual problem in doing it. If we have no conceptual problem, then we can perform thought experiment with it.

So, let's continue our thought experiment with the transporter. If two identical copies can be reconstructed at will, what constitutes our own identity and its continuation through space-time? Are we really who we think we are? Hanley has a discussion of the continuation of personal identity through time in Chapter 4 of his book "Is Data human". In particular, he addressed questions like whether a ship is the same ship when its parts have been gradually replaced over time due to maintenance to the point that it has a completely new body. However, this is of no concern to us because whether the ship is still the same ship is just a matter of definition. You can give

it a new name, or you can just keep the old name and insist that the ship is still the same ship. There is no conscious being who feels that he/she is the ship from inside and ask “Am I the same ship?” My concern here is about the conscious being that wakes up one day and finds another identical-looking brother standing next to him. Which brother will you wake up in, if you happen to be the person who gets transported?

Let me explain why which body one will wake up in is such a big concern if two copies can be re-constructed from the same blueprint.

Imagine you are being forced to make a decision before teleportation: If accidentally two identical copies of you are reconstructed at the receiving platform, one with the original atoms (beamed over from the originating station) and the other with replacement atoms, and one of the two has to be destroyed because of regulation, which one would you authorize to destroy? It just makes sense for you to give the authorization “pre-launch” while you are still 100% you. Now how will you decide? You really have to think hard because if you make the wrong decision, you will risk being killed and your clone taking your place in the future. So, how will you decide? Many people will choose to preserve the copy that has the same body material (i.e. the one reconstructed with the original group of atoms), and destroy the copy that is

reconstructed with new, but identical atoms, because this copy is more likely to be viewed as the clone.

However, there is another scenario in which one may draw a completely different conclusion.

Imagine someone managed to swap one atom in your body with another atom of the same type at the same energy state. Chances are you will not feel any difference after the one-atom swap.

Now, imagine this person keeps playing this same trick on you, replacing your body material one atom at a time while you are awake (don't ask how, I know it will be impractical, and nearly impossible, but it does not mean we cannot think about it conceptually). Since you have the same type of atoms replacing the original atoms, they are performing the exact same function as the atoms they replaced. If replacing one's heart with an identical heart (even a donor heart will do) does not change that person's identity, replacing a single atom with another identical atom will not change a person in any way as well. Even after this procedure is performed to the entire body, when your last original atom is replaced, you are still the same old self. This is because if you (or your consciousness, your mind) have changed, then we will have to ask when did this happen? Did it happen when you were 1% replaced, or when you were 50% replaced, or 90% replaced? Since this replacement is a continuous process,

atom by atom, and since any line we draw is going to be arbitrary, and so if replacing the first atom did not change your identity and the self, replacing all up to the last atom should not. You are just the same old self with a new body.

One can also reason that our body cells are continuously being replaced with new cells over time, and we still have this something that is constant staying with us (our Self), replacing body atoms with identical parts should not cause us to change in any way whatsoever. So, this is not the problem. The problem is when this person takes your old body atoms, and put them back in order according to your body blue print, and end up with a new guy identical to you (actually, the old guy), now you have two bodies. Now, which one is your true self?

When the transporter reconstructs two copies of the same person, we have a tendency to recognize the one with the original body material as the original person, and the other as a clone.

However, if you do an atom replacement operation first, then use the old material to reconstruct the old guy, now the guy with a new body is recognized as the same guy, because he has gone through this change gradually over time.



But the two procedures, the tele-portation and the atom replacement procedure, are essentially the same procedure. Both start with one person, and ended up with two identical copies. If you are that person, how will you feel? Which body will you end up in?

This is the big question! If you are a third-person onlooker, there is no problem whatever because what happened is just one living human got copied into two identical humans. If there were one Clark Kent to begin with, there would be two Clark Kent afterward, end of story. But if you happen to be this person who has just gone through this procedure, it will be really troubling, especially if one of the two copies will need to be destroyed for some reason, because it could be you who will get destroyed. It is a big deal.

Needless to say, if a person can be reconstructed from his body structure blueprint atom by atom, the human society as we know it will be forever changed. Criminal justice system will no longer work the same way. Imagine a murderer being sentenced to death. Is it ok for the family of the murderer to ask for a reconstruction of a body based on the blueprint right before execution? How about basing that on an earlier blueprint when he still hadn't committed the crime, so that you don't reconstruct a criminal, but just someone who might turn criminal given the right condition? How about the victim? What if we just re-construct the victim from the blueprint taken

before he was killed? Will we then achieve immortality? If transporter is possible, we have a crisis in our understanding of what personal identity is.

## **Even if the transporter does not work, we still have a good case for a thought experiment**

Some people object to the idea of the transporter on technical ground. Krauss showed how impossible it is in his book “The Physics of Star Trek.” It is not that technicality is not important. But unless the technical problem is a fundamental problem that conceptually challenges the premise of such a machine, we should be allowed to perform thought experiments and explore the consequence. Here is why I think the transporter thought experiment is meaningful: If a doctor surgically removes one’s left arm from the body, and carries it, along with the rest of the living body, on two separate stretchers and haul them to another hospital, where another doctor surgically re-attached the left arm to the body, the same person is going to be recovered at the end of this procedure. Detaching body parts and re-attaching body parts for medical purposes are pretty much regular surgical procedures performed routinely all over the world. This is, in fact, one form of the “tele-transportation” because you first get partially de-constructed, then transported,

and then fully reconstructed at the destination. At the end of this process, the “transported” self is the same old self.

Taking one step further, when brain transplant becomes technically possible, if a doctor takes out multiple organs including the brain in one hospital, and puts them back in another, one can be quite certain that the reconstructed person is the same person after the procedure no matter it is the third person point of view or from the point of view of the patient himself.

If we apply the same concept to the extreme with atom-by-atom manipulation capability, it is the Star Trek’s transporter. It is also the body atom replacement machine. Instead of taking organs out one by one, we imagine the transporter takes atoms out one by one. Instead of putting organs in one by one, we imagine the transporter puts atoms in one by one. As long as we have a right picture of the human body that is made of atomic Lego blocks, we should be allowed to imagine the Lego blocks being taken apart one by one, and re-constructed one by one. The only problem would be if we have the wrong mental picture, then we may end up with nonsense. This is the beauty of logical deduction through thought experiments.

Before Galileo, it was thought that heavier object fell faster. Evidence? Well, look at a piece of rock and a feather! Which touches down first? Of course it is the

rock.. So the claim. As the theory went, if it was twice as heavy, it fell twice as fast. But of course this is not true. If this were true, then we could take out three pieces of rocks of similar weight, and we tied two of them together with a light string, leaving the third one on its own, and we drop all of them at the same time. Now the two pieces tied together was twice as heavy as the third one. So the two pieces that are tied together would fall twice as fast? You can make two pieces of rock fall faster by connecting them with a piece of string in between? What a piece of nonsense! So you know heavier objects cannot fall faster. In fact, all objects fall with the same rate, if not because of air resistance. It is called the acceleration due to gravity. This is the beauty of logical deduction through thought experiments.

So, since we arrived at two incompatible conclusions about who is the real self after reconstruction, we may be getting our human body model wrong. Maybe the Lego structure is too much of a simplification.

But we also know that, the classical materialist's concept of a human is the physical human body. The identity of the conscious being inside this physical body is defined by either 1) the material it is made of, or 2) its structure, or both. With the transporter and the atom replacement procedure, we are forced to figure out whether it is the material or the structure that truly defines one's personal identity. Depending on the sequence of deconstruction

and reconstruction, we arrived at two different conclusions.

Something is not right.

## **Where is the boundary between you and the outside world?**

It is always interesting to try to determine where the self ends and the external world begins. It is because if something is not part of ourselves, we generally don't care as much. Many people may take the boundary between us and the outside world as our skin, the boundary of the physical body. But it is surprisingly unclear, when we use the atomic Lego block human body model to think about our physical body.

Let's start from the outside. If I am driving a car, and when something hit my windshield, and when this event is registered in my brain, I know something just hit my car. However, in daily language, one is equally likely to say "something hit me". In this case, ME includes the car. But obviously, you know you did not get hit. Your car did. The terminal point for the signal to travel to for you to get the feeling of being hit is your skin. From that point on, the signal routing is all internal. Now, suppose while you are driving, something hits your hand and causes a scratch. You can now say "something hit me". However, obviously, your hand is only part of you, and not the whole you because you have other body parts as well. When you said, "something hit me", you really mean something hit your hand. The event caused some feeling, just like the event when something hit your car.

The sensation may be different. In the former case, your nervous system transmitted a sound, or a feeling of mechanical impact, or some other signal to your brain. In the second case, your nervous system transmitted some feeling of scratch (may be itchy, may be painful) to your brain. When practice of artificial organ transplant becomes wide spread, the boundary between oneself and the external world becomes much more unclear. For example, should I consider an artificial limb part of me, or should I consider it part of the external world? How about an artificial heart? Artificial skin? Artificial kidney? Artificial blood? If we keep asking these kinds of questions, we are going to end up with the realization that we are only the nervous system (including the brain), while the rest of the body is just there to provide an environment for the nervous system, the real you, to live in, not unlike the car providing an environment for your body to reside in. Whatever the external world transmits to you, it transmits through your skin, then to you, the nervous system. In this view, your body other than the nervous system can be considered as part of the external world where you, the nervous system, lives.

If there is a way to simulate all the signals that are transmitted to the nerve system through the body, and feed those signals directly into the nerve system, you may not even know that it is a simulated environment. You may think you are on top of Mt. Everest while you (the

nervous system) are actually being kept alive in a jar, a special one that can simulate all the signals including vision, vibration, etc for the consumption of your nerve system.

So, the rest of the body can be viewed as just part of the external world, replaceable with a jar, the simulator. Of course, you may still want to keep the body because it is the ultimate simulator.

In this view, the boundary between you and the external world is the boundary of the nerve system and the rest of the body because the rest of the body is now considered part of the external world.

How about the nerve system? We know that some nerve cells are there just to transmit signals back and forth between the brain and other locations in the body. Presumably, these ever extending nerve cells can be replaced by some artificial connector fibers as long as the same signal gets transmitted into the brain. So, part of the nerve system can be viewed as part of the external world as well because replacing them with artificial means will not jeopardize the nature of the self. So, you are really just the brain, the part of the nerve system that is inside the head. That is where you reside. So, the boundary between you and the external world is the boundary of your brain.



How about the brain? Let's look at the visual cortex. Let's assume in some future day, the visual cortex is completely mapped and its functions completely determined. We can then completely identify the interface between the visual cortex and its interaction with the rest of the brain. Furthermore, there is definitely no conceptual difficulty to imagine that we can design an artificial drop-in replacement for the visual cortex. The difficulty is only technical, not conceptual. Again, replacing the visual cortex, as long as the interface is clearly understood and properly maintained for the operation, poses no danger to the nature of the self because the rest of the brain does not even know its visual cortex has been replaced if it is done right. Therefore, with the same spirit as considering the body without the nerve system the external world, we can consider the visual cortex something that is just there for the rest of the brain to interact with, and therefore, part of the external world. The boundary between the self and the external world has just taken a giant step inward. So, "you" are your brain minus the visual cortex, and that is the boundary.

Let's look at the frontal lobe, and the rest of the brain...

Theoretically, we can do the same for all other parts of the brain. We can do that until there is no brain left. If you don't agree with this deduction, then you have to admit that there is a point in the brain that is you. But there

isn't. The nature of the brain is a distributed neuron network. It is probably very close to a distributed computer with each part doing different things but with no part being central. I believe this point is quite clear at this point from current brain study.

So, where is the boundary between the self and the outside world? There does not seem to have one! Where is the terminal point for nerve signal to travel to so that I can "get it"? There does not seem to have one. So, who is getting the signal? Only part of the brain is getting the signal and I become aware of it?

How does subjective experience get generated? How does "my" brain get connected to "my" feelings?

## **Maybe there IS a boundary**

In the previous section, we have seen that we simply cannot draw a boundary between oneself and the outside world when we go step by step inward with the atomic Lego block human body model. The skin is not the boundary, the nervous system is not the boundary, and any part of the brain is not. We reasoned by taking a mechanical view of the brain and assumed that we could replace each part of the brain by some equivalent substitute and drove them outside of our personhood definition to become part of the external world. This line of reasoning is fine as long as the brain is really a Lego block-like classical mechanical structure, classical mechanical as opposed to quantum mechanical. If part of the brain is quantum mechanical in nature, then our reasoning breaks down.

What is classical and what is quantum mechanical? Classical physics refers to the mechanical world-view that was developed in Newton's time. In classical physics, there is an objectively existing external world where objects of this world are built up by some fundamental building blocks such as molecules and atoms. These fundamental building blocks exist in the sense that all of them have definite positions and are moving in some definitely velocity at any moment. They group together and form compounds and other chemicals, but they are still doing that by having definite positions in space and

are moving in some definite velocity. A “classical” object is one that is made of these fundamental building blocks in a manner that exactly mirrors the Lego blocks.

On the other hand, a quantum system is one that is not like a classical object, one that whose components cannot be described as being made of building blocks interlocking together like Lego blocks. Superconductor is one such example. The electrons inside a superconductor form the so-called Cooper pairs that allow all of the flowing electrons to squeeze into the same quantum state, in which they flow without any resistance. In a quantum system, some essential components don’t have definite positions, even if the components are point particles like the electrons. In a quantum system, sometimes the concept of position is ill-defined because it is not something you can confirm or measure, or it is something if you perform measurement on, your action of measurement disturbs the system so much that it is already not the same as what you want to measure in the first place. A quantum system is inherently ghostly, because it is unlike anything you have seen before, to use the famous physicist Richard Feynman’s words. For a quantum object, the method that is used to observe it matters.

If our brain’s operation has an essential component that is quantum mechanical, then the “no-cloning theory” in quantum mechanics kills any attempt to determine the

brain state in order to clone the quantum part of it. If this is true, then some part of the brain will not be able to be replaced with substitution part and be considered part of the external world. There may indeed be a boundary between “you” and the external world.

One should also note that, if the operation of the brain is partially quantum mechanical, then the erroneous teleportation scenario we envisioned previously would no longer be possible. In quantum teleportation, the transmission of a quantum state to a different system necessarily destroys the original copy, leaving the transmitted copy as the only authentic copy in existence. So, if a human has essential quantum mechanical component, then the no-cloning theory forbids one person from being transported into two.

Maybe quantum mechanics is the solution to all these confusions arising from teleportation and the lack of a well-defined boundary between oneself and the “external” world.

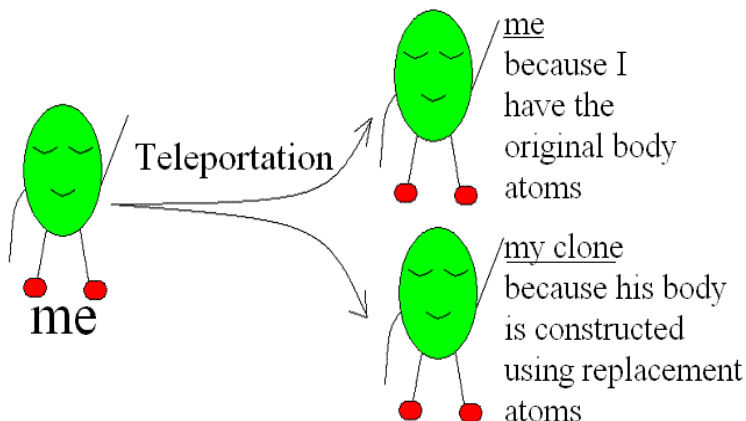
At this point, it seems that a logical possibility is that the brain is indeed a quantum mechanical system of which the operation is critically dependent on the quantum nature of its processes because if the brain were a classical system, the problem of possible duplication in teleportation and the lack of a physical boundary between

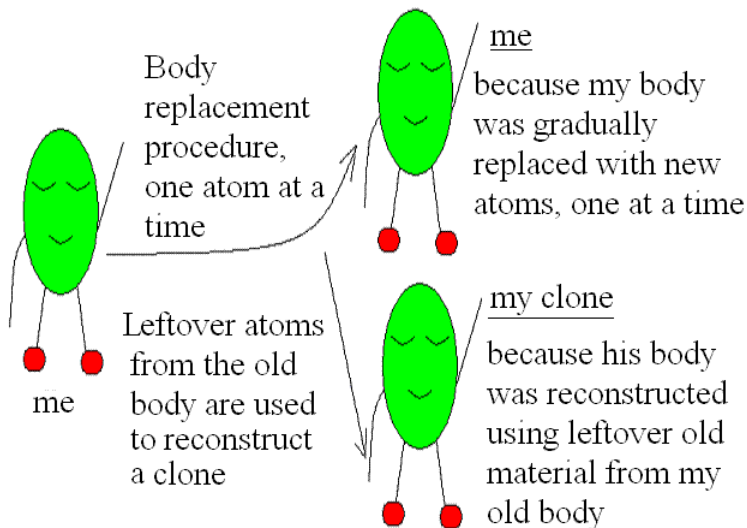
a person and its environment challenge us on our basic understanding of personhood and personal identity.

## The brain as a quantum mechanical system

Let us summarize the previous discussion that leads us to the conclusion that the brain is a quantum mechanical system.

First, you have these two procedures, the teleportation and the atom replacement procedure, both start with the same person (same initial condition), and end up with two people (same final condition). But the continuation of a person's identity ends up exactly the opposite ways in these two cases.



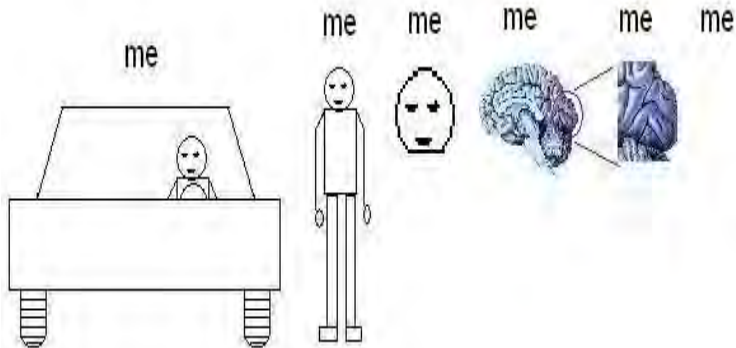


In the first case, the guy with my original body atoms after the procedure is me and the other copy is a clone. In the second case, the guy with my original body atoms is my clone, while the one with the new body is me. Same initial condition, same final condition, but the identity is exactly the opposite afterward. That is, if the body is indeed a Lego block structure built with atomic Lego blocks, then teleportation and atom replacement procedure is conceptually doable, and we will end up with this conceptual nonsense.

Second, if we are indeed a structure of atom Lego blocks, then there is no clear boundary between the real me and



the external world because we can conceptually think of part of our body as the peripheral which is a part of the external world. As we go deeper and deeper into the brain, we literally and conceptually shrink the physical boundary between oneself and the external world from the car we are driving to our skin to just the brain, to just part of the brain, and finally nothing. I am NOTHING.



There seem to have no boundary between what we consider “me” and the external world. There is no boundary between what is private/internal and what is public/external.

But we know there is a me and I have an internal world which is not part of the external world.

The only logical conclusion to draw from these two non-sensible results is that we are not a structure of atomic Lego blocks. We are atomic structures, but there is some part of us that cannot be simply taken apart atom by atom. The system that we cannot take apart atom by atom without destroying it is a quantum system on which a probing action will destroy. The probing of the structure will destroy its coherency, and thus its nature. Therefore, it implies that our brain is quantum mechanical, and attempts to duplicate it will necessarily destroy the original.

We therefore have a quantum brain.

If we have a quantum brain, then we can further infer that it is the pattern that defines us, not the body material. It is because in quantum mechanics, identical particles are indistinguishable. One hydrogen atom is indistinguishable from another hydrogen atom if they are interchanged. As long as we have the same pattern, it is unique. Any attempt to duplicate a quantum pattern will destroy the original copy, ensuring that the clone is now the unique copy to take the place of the original copy.

If we have quantum mechanical component in our body, we can be assure that Scotty would never be able to beam anyone up into two. There will always be a unique copy of me to continue my stream of consciousness after teleportation. The new me carries the same pattern as the

old me, though not necessarily with same material, but it is still the same me.

One problem resolved, but many more arise: Why are you this particular pattern? What pre-ordained you to be this pattern? What happen if there are two identical patterns (not from cloning or teleportation, but just happen to exist, maybe even at different times)? Is the carbon-based body of yours the only way to express THIS pattern? What if the “pattern” is coded in a different physical form? What is this unchanging thing that defines one’s identity throughout one’s life? We know it cannot be the pattern because pattern keeps changing throughout one’s life. Pattern identity can only be the factor in the continuation of personal identity from one moment to the next, but not throughout the entire life. But if it is not the pattern, then what is it? These are all exciting questions, all deserve answers.

## **Section II**

### **The Soul**

## **The concept of a soul**

I don't know when you first got the concept of a soul. I got mine from watching TV when I was growing up. It must have been before I turned teenager. I remember seeing on TV a character lying lifelessly on the ground. Out of this lifeless body an image of a translucent figure, apparently played by the same actor whose character was lying on the ground, rose from the same lying position and flew upward towards the heaven. It was the see-through factor that indicated this was no ordinary human body. Instead, it was the soul of the dead person. So, I cannot say if I would ever arrive at the concept of a soul on my own had I not seen it on TV. However, it does appear to be natural for some to propose an extra to the physical body that may survive the physical death of the body. After all, fear of death is universal. Wouldn't it be nice if we can survive the physical death through that extra thing? On the other hand, would this concept of a soul lead to self-contradiction? Is the concept even necessary?

Most major world religions embrace the concept of the soul. Soul and spirit are assumed in Christianity, Judaism, and Islam. The eventual entity that is going to be with the supreme God is the soul, and is never the physical body, which we all know will decay away. In

fact, some priest preaches that we, the souls, are all going to get a new heavenly body after we die, if we are accepted by Christ. Hinduism and Buddhism also assume the existence of something besides the physical body. In fact, in Buddhism, the physical world is sometimes viewed as less real than the spiritual world, where the mind exists.

A discovery in 2008 of a stone slab with inscription by a group of archaeologists from the Neubauer Expedition of the Oriental Institute at the University of Chicago shows that as early as the eighth century B.C., people already possessed the concept of soul. Chinese ancient writings describes immortal beings ruled the far corners of the world, with gods in the heaven, and ghosts in hell. The gods are the immortals, and the mortals eventually turn into ghosts.

Is it human intuition, yet improvable, that there must be something else, in addition to the physical body that constitutes the full human? Or is it just the fear of death, which is a major motivator in religion, that human finds the concept of a soul comforting? Or is it a logical necessity that soul exists?

The word soul has been frequently mixed and matched with terms like the mind, and consciousness. I am not going to try hard to distinguish the differences because none of these terms can be precisely define anyway.

These are vague concepts that people have about the nature of a full human in addition to the physical body, if there is anything extra to the physical body. Often people talk passed each other, fixating on different aspects of the concept. Sometimes, a medical professional will refer to responsiveness as consciousness. But to a philosopher, consciousness may have to do with the existence of feeling from within than mere appearance of responsiveness from the outside. To Descartes, the mind is what thinks. But more modern understanding is the brain does the thinking, and very often, the thinking process is not even elevated to the conscious level. Furthermore, to some, the soul is what is in our morality. But we also know, the standard of morality is cultural dependent. It indeed is a confusing situation.

## **The concept of a soul is useless unless the soul is forever**

If we use the concept of the soul to avoid death, and if we use the concept of the soul to pass on personal identity after physical death, and if the soul ends up being destructible, what is the concept good for? Therefore, to me, if anything can be assumed for the soul, it has to be permanent and forever. It has to exist before birth and it has to exist after death. This is a property that even a omnipotent creator cannot take away for this concept to be useful. It is difficult to imagine a creator would create

a human in two parts, one part the body, the other part the soul, and both parts being separately destructible. Why not just put all the properties into the physical body? If the soul can die, the physical body can already accomplish death, and what else the soul needs to accomplish, why is the soul even necessary? So that it can outlive the body and die on its own? I think not.

Therefore, I conclude: If there is such a thing as soul, it is forever.

## **The problem with the mind as a separate unphysical entity independent of the body: The dualistic view**

In the book *“Is Data Human”*, Richard Hanley wrote “..if your mind isn’t part and parcel of the material world, then it’s hard to see how it could interact with the material world—you can’t have it both ways.” This summarizes one important objection to the dualistic view that the mind is an independent entity of, and extra to, the physical body, and is the agent that makes the decision: Making up ones mind, so to speak.

Hanley’s comment was directed toward a scenario in Star Trek the Next Generation where two characters Commander La Forge and Ensign Ro Laren went “out of phase” with the material world and became invisible and undetectable to their crewmates, and their bodies acquired



this non-interacting soul like property. However, they were able to see and get information from the rest of the world. So, here is a problem, as Hanley pointed out: If you can see, light has to be absorbed by your eyes. Going along with Hanley's logic, if light can be absorbed by your eyes while you are "out of phase", then people looking in your direction will receive less light and the area where your eyes are will appear darker. People will see two shadowy figures (one for each eye) and so you will not be completely invisible.

We have the same problem here in the dualistic view of the mind and body: the mind the spiritual, and the body the physical. If the mind is a separate entity independent of the brain, and if it can influence your decision through your brain and your body, and somehow the mind knows what the brain is thinking, how can it be not interacting with the physical brain? If it does interact with the physical brain, then it is not completely undetectable in the material world. There are some things in the material world that the mind interacts with, i.e., some material in the brain. We can then use these materials from the physical world to construct a mind detector of some sort to detect the existence of the mind. If we can detect the mind with some physical means, interact with the mind with some physical means, isn't it for all the meaning of the word physical, that the mind is physical? What does it mean for it to be mental and not physical? If it is

physical, then we can ask whether it is made of new material. If it is, let's call it the mind material. If it is not new material, we can investigate what it is made of. It may turn out that the mind is really just part of the brain. This way, the dualistic view of the mind body problem reduces to the monistic materialistic view.

So, the interacting model of the dualistic mind-body relationship cannot work.

The only way the dualistic view can work is for the mind to be passively soaking up information from the brain while completely unable to influence it. This one-way action leaves the mind completely undetectable and remains "immaterial" for the material world.

One word about the claim that if you can see light, you must absorb light: While we think this is true in the material world because we have yet to find some material that can detect light but does not absorb light, this is not necessary true in general. This claim that if something can be affected by light, it has to absorb light is such a broad claim that the burden of proof resides on the one who claims it once you include the possibility of immaterial substances.

In real life, we see this kind of one-way effect all the time. A computer program can affect (in fact, determine) what a computer will do next, but the computer cannot change

the program itself, unless it is designed to. It is entirely possible that “something” (probably immaterial) can be affected by light, but cannot affect light, not to mention absorbing light, thus retaining this thing’s immaterial property.

This dualistic view of the mind body relationship where the mind exists independently as an observer but unable to influence anything in the physical world is referred to as the epiphenomenalistic view in philosophy.

We will have more to say about epiphenomenalism towards the end of the book.

## **Section III**

### **Meaning of life**

## **The mystery of one's own existence**

This question almost happens to everybody: Why on earth am I here? Indeed, you look around, and you see a lot of people around you. There are people you know, and there are people you don't know. Those you know, you came to know after you got into this world. But before that you don't recall anything. How did you get here?

For many, the feeling is like suddenly finding yourself standing on an unknown island but you have no idea how you got there. You cannot find any sign of a plane crash, nor can you find evidence of a ship wreck. Any yet, you are here, standing on this island. If you stay long enough on the island, you will notice that more and more people appear after your arrival. They seem to have risen up from the dirt. You start to wonder if you came the same way. When the new people first appear, they all seem very confused, and naive about the rules of this island. As new people appear, those who were already here keep disappearing. Almost all but in a few cases, people look frail before they disappear. You ask around, nobody seems to know why people keep disappearing, and nobody seems to know where those disappeared went. But one thing for sure, those disappeared have disappeared for good.

Now that you have grown accustomed to the environment of the island, and you start to feel comfortable about this place. You built up something you call “home”. You developed some friendship. While you are still trying to find out why and how you got here, at the same time, you start to fear one day you will become frail and disappear from the island as well. You start to wonder why you are accumulating so many belongings, which you know you can never take with you when you disappear. You start to wonder again where you came from, and where you will be going. You don’t know when you disappear, whether it is the end of your existence or just returning to where you came from. Some people circulate the view that you came from nowhere, and you are going nowhere. That is it!

The fear of death is universal. It is perhaps the fear of death that triggers the question of meaning of life for most people most of the time. When life turns difficult, one often asks, what have I done? Why am I here to suffer the pain? From this two questions usually arise: What is the meaning of life? Is life meaningful? These two questions are seemingly the same, but they are different. One deals with the reason of existence, and other deals with whether you are happy with your existence after you know the reason.

Fear death we do. However, eternal life is not necessarily the answer either, as we can see from “The curse of eternal existence” next.

## **The curse of eternal existence**

There is a horse that runs a grinding stone in a mill. This horse goes round and round in a specific circle. In fact, the circle on the ground was formed by its own footsteps long time ago. It does it 365 days a year, seven days a week. It is well fed, but all it does is running around in a circle. This is all it does, day in and day out. And, very importantly, this horse is immortal, and it will run the circle forever.

There is another horse. It is in the wild. It is an ordinary mortal horse. It has to run from its predators. It has to find its own food. It needs to migrate to follow the water source when local water dries up during the drought seasons. For that, it faces the possibility of being eaten alive by lions that also gather around the several remaining water ponds hundred miles to the east. Everyday it grows exactly one day older. Every moment, it is at a slightly different stage of its life. Every year it is one year closer to its final death, if it does not get killed earlier.

Which horse's life is more meaningful?

To most people, the life of the immortal horse is more like a curse than a blessing. What kind of life is that? Running aimlessly in a circle forever? On the other hand, precisely because of its finiteness, some people may find



the life of the wild horse more appealing. At least, within its finite lifetime, the mortal horse is free to do what it pleases.

But what is the meaning of life anyway? Why is the life of the mortal horse seemed more meaningful to some?

Perhaps, it is the repetitive nature of the life of the immortal horse that turns people off? However, when one becomes immortal, in the long history of his/her existence, he or she is bound to exhaust everything there is to do. At that point, everything else is a repetition. In this regard, will the life of an immortal still be meaningful anymore? You have done everything one hundred times over. There is nothing else new for you to do in this world!

Let's look at one example of immortality: The character of Gandalf The White in "Lord of the Rings".

Gandalf is an immortal wizard in J.R.R. Tolkien's novel "Lord of the Rings". Gandalf the Grey did find himself almost died "fallen into the Shadow" fighting Balrog inside the Mountain of Caradhras. He did not die though. He was given a second chance and he returned as Gandalf the White, with even greater power.

Gandalf fought the evil Sauron. He led the fellowship of the ring. He rode the great eagle to escape from the pinnacle of Orthanc, where he had been trapped by

Saruman. He befriended the hobbits. Gandalf's life was legendary, exciting, and full of adventures, exciting enough for the movie to win several Oscar awards and achieve record box office numbers. Many people would probably like to live Gandalf's life as an immortal. Why not? Here is the problem: Gandalf is immortal. Over time, he has done everything there is for him to do. He would see the birth and death of his friends, many of them, to the point that he may not be sensitive to friends any more. He would see the rise and fall of kingdoms and dynasties. He would see the rise and fall of civilizations. He would have visited the Middle Earth thousands of times. Overtime, he would come to know every tree. He would have experienced everything there is for him to experience. At some point, he would run out of new things to try. Everything he does from that point on will just be repetition. He may turn numb to the battles between good and evil, just like a person turning numb to the battles between two groups of chimpanzees, one "good" and one "evil", somewhere in the forest. He will see no need for intervention, because the world will just run its course without him. At some point, he will be like running in a circle like the immortal horse, even though it is a very impressively huge circle, yet still a circle. At that point, what is he going to do? Old friends are all dead, new "friends" are continuously being born (he has to befriend them for friendship, though). They come and they go. Over time, he will come to know all other

immortals like him, no doubt some of them he will be in constant battle with. He will be trapped inside this never-ending chess game. What kind of meaning is it for one to be trapped inside a never-ending chess game? In this regard, isn't immortality more a curse than a blessing?

If at some point the world just look repetitively the same for an immortal, what will prevent an immortal from going into a nap of a thousand years before waking up to take another look, just to make sure that there is nothing dramatically different, and then goes back to sleep for another thousand years and so on and so forth? How about extending the nap to 10,000 years each, and subsequently longer and longer before an immortal finds no need to wake up at all? What is the point of waking up anyway if you don't have to? Applying the same question to a mortal, the question becomes "why exist at all if you don't have to?"

One way to break away from this immortality trap is to have the environment forever changing so that there are always new exciting things to explore. That is, an infinitely long existence within an infinitely vast space-time continuum with infinite possibilities. Perhaps, it is the unknowns that give life it's meaning. However, this thinking is based on the assumption that the exploration is going to be a pleasant one. If the exploration is going to be full of painful experiences like a late stage cancer patient, why bother? Isn't it still better to take a thousand

year nap instead? But then if you are taking a nap, does it matter if it is a thousand-year nap or a two-minute nap. Sense of passage of time is relative, not absolute. A two-minute nap is the same as a thousand-year nap, only that the world changes more in a thousand years. But if you have seen it all, there is really not much change in a thousand year's time too. So, if the world seems boring, you need a reason to stay awake!

At some point, the sun is going to burn out. Shadow will fall upon the Earth, not just Middle Earth, but the entire earth. The earth will become freezing cold before it turns burning hot. In the distant future, there will be no plants. There will be no animals. There will be no civilizations on Earth. At some point, the earth will be swallowed up by the dying sun as the sun turns into a Red Giant, expanding its red-hot envelop outward beyond the earth's orbit. Perhaps, after all, there is no immortality. But let's say Gandalf survives the earth falling into the sun, he will have to find a new life inside the sun, where the fire is literally more intense than the fire in hell. To escape the intense fire, and the meaningless existence inside the constant intense fire, he will have to travel to other planets to live, to have a meaningful life. Assume he is able to do that, given long enough time has passed, he would have made the hop many times over. He will have hopped from one solar system to another solar system, from one galaxy to another galaxy. And it is within this

infinitely huge space-time that he continues to exist forever, to explore forever. That may be appealing, to a certain extent.

Scott Adams, the creator of the office cartoon character “Dilbert”, wrote a book called “God’s debris”. The book touches upon concepts that are quite fascinating even for a physicist. He asked in the book, what is an omnipotent God to do once he has done everything? Imagine someone who will never die, someone who can do anything, and has indeed done everything, someone who is infinitely more powerful than Gandalf. He has created the universe. He has created humans. He has traveled through time. In fact, he exists outside of time. He is everywhere in space. He is everything. He is eternal. Now, whatever he does he has done. He is omnipotent. At some point, he ended up repeating himself because he has done everything. If he is just repeating himself, and he is forever, what kind of life is that? Isn’t it quite the same as the life of the immortal horse that keeps running in a circle? Well, not quite. Since he is omnipotent, he can do anything, and he has done everything, except one. He has ever ceased to exist. So he wants to do that and he blows himself up (conjecture in the book, that is). We are part of his grand plan. You will have to read “God’s debris” to enjoy it. But the reason I am quoting this book is because if one digs deeper, immortality may not be as

appealing as it first appeared. It can turn into the *curse of eternal existence*.

## **But it is all psychology!**

However, deep in this discussion of the curse of eternal existence is the assumption of human psychology. To a human, the complete certainty of a repetitive future makes the future not very meaningful. For someone who is locked up for life in solitary confinement, the hope may be the eventual arrival of the end of life itself.

Outside of “normal” human psychology, we may have a completely different scenario. The immortal horse may find it very pleasurable to pull the grinding stone. The pleasure alone is probably enough to keep it going forever, kind of keeping it in a perpetual state of “high”. From the subjective pleasure, the immortal horse can turn a curse into a blessing.

Also exactly because of subjective experience, a blessing for one individual can turn into a curse for another if similarly applied. It does sound like if we can control our own psychology, we can turn many sufferings into joys. Of course this is true, but it is also a fantasy. You are who you are. You are limited and governed by your genes. A seemingly embarrassing situation can be turned around by a comedian resulting in laughter and enjoyment for everyone, while the same embarrassing situation can

cause a much more serious person to jump off a bridge. Subjective experience is a major player in the meaningfulness of life.

For something to be meaningful to you, you will have to know the cause behind it and you will have to agree with the cause, and then to feel good overall about the process. For some action, even though you may feel uncomfortable going through, after it is all done, there is an overall feel good factor in it. You have to feel good about something for it to be meaningful to you. Sometimes, the “feeling good” alone is enough of a reason for one to agree with the cause and enjoy it (e.g. eating ice cream). People who are in deep depression are often incapable of feeling any fun out of any action. As a result, depressed people often cannot find meaning in most of what they do. The only meaningful action is the one that can get them out of the depression, or get them out of existence altogether. The latter option is of course very dangerous.

Let us elaborate more on the point about the net feel good factor for something to be meaningful. Let us think about watching a movie as an example.

When is watching a movie meaningless? It is when the movie is so poorly made that you derive absolutely nothing except negative feeling out of it. That would be a complete waste of your time, wouldn't it? If a movie is

well made, and it is fun to watch, the meaning of watching it is self-evident. Of course, sometimes one cannot speak of pleasure being derived from watching a tragedy superficially. But it is equally important that we learn something by going through an emotional journey of watching a sad movie. Some people do enjoy sad movies. Enjoy in a much deeper sense than simply bodily stimulant. Maybe it is the empowerment felt after the movie, or the deeper understanding of another one's life that one can compare to, and feel fortunate about, or simply the better understanding of life, and something to identify with that makes you feel you have gained something. You have to feel good overall for the movie to be meaningful to you.

Maybe the immortal horse is deriving enough feel good factor from running in a circle due to its own psychology, and is enjoying every step of it, and is never tired of it. Maybe this immortal horse has its own version of severe Alzheimer's disease, which causes it to believe each cycle is the first cycle, and it just happens to enjoy the pleasure of pulling the grinding stone for the "very first time"? Maybe for this forgetful immortal horse, each cycle is full of excitement, full of expectation, because it is being done the "first time". Now, is this life of running in a perpetual circle meaningful? To the immortal horse, with its own particular psychology, yes. To an on-looking human with normal human psychology, no. The onlooker simply



projects his own human psychology into this immortal horse to come to this conclusion. It is all psychology.

## **Is life meaningful for the mortals**

We all know the mortal horse in the wild is going to die eventually. To a certain degree, whatever it does is in vain, temporary, short-lived. Joy or no joy, at the end, it is emptiness. After that, there is no one to feel better. Then how do you assign meaning to the life of a mortal? “Meaning” with respect to whom?

Implicit in our discussion of meaning above, we are always comparing an action with other alternatives. A meaningful action is one that makes us feel better, among all the other possible alternatives. When we have two choices, choosing the one that makes us feel better is definitely more meaningful than choosing the one that makes us feel worse, unless you intentionally want to try “feeling worse” for other purpose that makes you feel better overall, like an immortal God intentionally tasting the pain of death in a human form Jesus for higher purpose. The obvious alternative to watching a movie is not to watch the movie, and use the time to do something else. It is in this sense that we define the meaning of watching a movie. But when we talk about the meaning of life for a mortal, what alternative do we have? That will be not living! That will be the option of never been born, or the option of suicide, if one is already born. In

fact, people do commit suicide when life has lost its meaning to them. Eventually, when we mortals ask the question of meaning of life, we are asking for the reason of our very own existence. Just like an immortal who needs a good reason to stay awake, we mortals need a reason for our own existence. Why am I here? What is the reason of being here as opposed to not being here? If we know the cause, and if we agree with the cause, our existence is meaningful. If you know the cause, but you don't agree with it, then this life is probably not very meaningful to you. One's attitude carries a great swaying power in determining whether one's life is meaningful or not.

Some people who are put into an extremely difficult situation can suddenly become at peace with the environment by adapting new beliefs. In cultures where reincarnation is a widely held belief, people may be told that their current suffering is to repay the debt they incurred in their previous life, and the situation becomes much more bearable. In Christianity, a difficult situation can be interpreted as a test of one's faith by God, and this interpretation will also make the situation much more bearable, or sometimes even meaningful. Of course, the concept of the original sin mitigates the guilt one feels towards his/her wrongdoings, and also encourages individual to seek salvation through Jesus, kind of looking forward for remedy than keep drilling on the past wrongs.

But no matter whether we agree with the cause of our existence or not, we first need to know it before the meaning of life, and the meaningfulness of life, can even be discussed. But do we know? Can we know?

## **Section IV**

# **Qualia, the Hard Problem of Consciousness and the Many Phenomena Leading to It**

## **The mystery of our own existence**

In the movie “The Matrix”, the “external world” is created by a giant computer. People are hooked up to this virtual reality environment from birth. Their brains receive input from the computer and are led to believe that they are living in a 20<sup>th</sup> century earth environment, while in fact, their bodies lie in their incubators, their brains interfacing with the computer, quietly generating energy for the consumption of this giant computer. They are completely unaware of the higher reality outside of their virtual reality environment.

When we dream, we are also led to believe that the immediate environment is real. We sweat about our adventure. We feel the joy and pain inside the dream just as real as in real life. Seldom do we realize that we are dreaming inside a dream. Even screwed up logic, some so screwed up that a normal person will see the absurdity right away, seems to make sense inside a dream. Most of the time, we are completely ignorant of the existence of a higher reality outside of the dream.

No matter where we are, in a dream or in a Matrix, even though the environment we find ourselves in may be illusionary, we can be certain that we are real. If we are not, who is the dreamer having this dream? Some philosophers claim that the Self is an illusion. It is not clear to me WHOSE illusion the self is. Is it the Self's

illusion of itself? If we are not real, who is having this doubt? If anyone has doubt about his/her own existence, we can always go back to the statement Descartes made, "I think, therefore I am." If I don't exist, who is thinking this thought? If I don't exist, who is the one feeling my existence? It has to be someone, and this someone is ME.

Therefore, we have no choice but to conclude that we exist! Our existence can be directly confirmed by our feeling it. It is the environment that we can have doubt about.

But the real question is why we exist to feel this world, or whatever world we think we are in, at all? If we are realists, and if we take scientific evidence seriously, this world has existed for billions of years without us, and out of a sudden, boom, we got dragged into it. How did it happen? This is how the famous 17<sup>th</sup> Century French philosopher and physicist Blaise Pascal put it (translated into English):

*"When I consider the short duration of my life, swallowed up in the eternity before and after, the little space which I fill, and even can see, engulfed in the infinite immensity of spaces of which I am ignorant, and which know me not, I am frightened, and am astonished at being here rather than there; for there is no reason why here rather than there, why now rather than then. Who has put me here? By whose order and*

*direction have this place and time been allotted to me?"*

Indeed, there is no reason one should exist here and now, and not there and then. Not two hundred years earlier, not two hundred years later, but now. Our existence here and now does seem mysterious.

This question has been asked by many people in many different ways. We will give two more ways here. The first one is: why do qualia exist for me? Qualia are the quality of those raw feelings: The painfulness of the pain when stepping on a nail, the joyfulness of the joy associated with a victorious moment, the redness of the red when we look at a red rose, etc. In other words, in a less technical way, the question really is "why do I have feelings?" The second one is: why humans are not just automata?

Why all these three seemingly different ways of expressing the mystery of our existence are in fact rooted in the same fundamental question will become clear as we explore on.

Let us examine the last question first: Why aren't we just automata?

## **Why aren't we just automata**

An iRobot automatic vacuum cleaner is an automaton. It automatically does what it is supposed to do: looking for a spot of carpet to clean, going back to the charging station to recharge its battery, parking at some location when it gets nothing to do. The difference between an automaton and a conscious being is the existence of internal feelings. An automaton does, or responds to, things automatically without association with any kinds of feelings. An automaton can be as simple as a thermostat, which automatically turns on when temperature is higher than a certain set point, and turns off if it is lower. Or, it can also be as complex as the central computer that controls a nuclear power station, with all sorts of feedback rules that maintain the smooth operation of the nuclear station. Of course, the automatic vacuum cleaner is one of the more complex automata we have in existence today.

Sometimes when we metaphorically describe something in human terms such as “the wind is happily massaging my face”, we write as if there is a conscious being, “wind”, that is “massaging” my face, and is doing it happily. The more one does that, the more one can really imagine some consciousness out of something that is completely unconscious. So, I will not be surprised if someone insist that the automatic vacuum cleaner has internal feelings. If you do hold this view, I can assure you that we are not talking about the same kind of



feelings a human has. The internal feelings one associates with an automatic vacuum cleaner is the internal states the vacuum cleaner's software specifies in response to a pre-anticipated situation, nothing more than the on/off states of a thermostat. It is not even in the same category as the type of phenomenal feelings a human has towards his or her environment or internal body conditions. In the discussion of consciousness, one major obstacle in communication between people of different opinions is the ability we retain from our childhood to see consciousness out of unconscious object. Children routinely give their stuffed animals clothing to keep them "warm". They love their stuffed animals as if the stuffed animals were actually alive and could feel their love. So, I am quite sure there are people who will insist that they can feel how an automatic vacuum cleaner feels, or insist that the vacuum cleaner's going to the charging station is because of the "feeling" of hunger. I am going to brush these type of opinions aside, and for the moment, assume I have convinced my readers that an automatic vacuum cleaner is just a machine, one that has no internal feelings whatsoever. You won't "hurt" its feeling by turning it on and off arbitrary. There is no conscious being suddenly finds itself looking out into the world from the body of this automatic vacuum cleaner, and is being hurt by your randomly turning it on and off.

If we accept the notion that an automatic machine has no internal feelings, then we can try to contrast this lack of feeling with another type of machine, a living human body, which has internal feelings associated with it.

So, the question becomes, why is there internal feelings associated with this type of biological machines known as the living human bodies. Why aren't we just machines? In fact, our bodies are machines. But we are more than machines. We are machines with feelings on top. The question is, what are the feelings for? Some people may be confused by the question itself. After all, if I don't feel hungry, how do I know I need to eat? But this is exactly where the misunderstanding is. The automatic vacuum cleaner does not need to "feel hungry" to go to recharge its battery. It does so because the electronic feedback circuit automatically tells it to, whenever certain signal is triggered (too low battery voltage, for example). Once the signal is triggered, a subprogram in the software will execute and it will find its way to the docking station to recharge. Presumably, our body can be triggered into eating on its own by some internal body signal (stomach content too low, for example), totally without your feeling it, exactly like the fat to glucose conversion process, which starts automatically if the blood sugar level is too low, totally without your knowing it. In fact, people who suffer a medical condition known as sleep-eating got up on their own at night and open the refrigerator, and

sometimes even cook, and consume a lot of food before going back to sleep, doing so completely unconsciously. We will have more discussion about sleep-eating later in the book. The point is, we don't need the feeling of hunger for us to eat. A signal of the need of food can trigger the unconscious part of the brain and that can cause us to eat. Why do you need to feel those signals as hunger? Why isn't it handled like many simpler bodily functions, which get taken care of completely without your knowing them? So, we have the following two part clarification for the general question as why we need to feel what our body does:

- 1) You don't really feel your stomach digesting food, do you? But yet, your stomach digests food all right,
- 2) Your brain seems to be quite a sophisticated organ that it can think for itself and for the entire body. If the simple stomach can take care of simple digestion automatically without your attending to it, the sophisticated brain should be able to handle every aspect of life such as looking for food, eating, thinking, etc automatically without your knowing it. Why do you need to be aware of what the brain is doing by "feeling", through the existence of qualia? Why aren't we living our life in autopilot mode, in the complete absence of qualia, like during sleep walking (not that we want to, but why aren't we)?

This two-part clarification thus connects the second and third way of phrasing the problem. In the absence of qualia, there will be no feeler, and the individual becomes an automaton. When the feeler is not there, we no longer “exist”, in the sense that we no longer feel our thoughts and feelings, leaving “our” bodies to do their own things in their own societies as automata. At that point, your body will still refer to itself as you (i.e. using your name), but “you”, the real feeling being, will not be there to witness events that happen through “your” body. Your body will be in autopilot mode.

The existence of this feeler that we sometimes refer to as the “self” is therefore a mystery. Neurologically, the “self” is completely unnecessary. The existence of me at this moment, and not any other moment, feeling the world through a particular body is completely unnecessary and is completely mysterious. This was the question Pascal asked: Why here, why now, and why me?

## **We have always assumed there is something extra**

Most people don’t believe our desktop computer has internal feelings, so it is ok to “kill” it (turn it off, smash it into pieces, etc) any time. To avoid complication, I will use the word “computer” to refer to a simple desktop computers running Intel or AMD chips on Windows, Linux, or Mac OS types of operating systems which most

people are comfortable with. Otherwise, we may find ourselves dealing with issues like what had been reported by the BBC in March of 2007:

*“An ethical code to prevent humans abusing robots, and vice versa, is being drawn up by South Korea. The Robot Ethics Charter will cover standards for users and manufacturers and will be released later in 2007”*

Even though it may sound silly to codify it so that people cannot “abuse” their automatic vacuum cleaner, but there are people who take robotic consciousness seriously. We will have argument later in the book demonstrating why digital algorithm driven robot/computer cannot have consciousness. But for our discussion now, we are going to stick with a simple PC or Mac that people are comfortable with as a machine without a soul, and not to get involved with some more sophisticated computers that some people may find “conscious”.

Let’s say we bought a pet dog program to run on a computer. A cute little realistic looking puppy thus appears on your computer screen. It barks, it crawls on the screen and it responds to your patting it with the mouse pointer. Now, consider “killing” this lovely simulated virtual dog on the screen, either by clicking the “x” button, or turning off the computer. No harms done, right? No one has been hurt. If the pet dog program

allows you to cut off the pet dog's leg, and "abuse" it in anyway possible, and let it "suffer" (judged from the dog's image on the screen), you may actually enjoy experimenting with it, not that you are evil or anything. At least you know no one is getting hurt, but you get to see how a dog looks like when it is being treated this way. It is just a game, even though it may be quite realistic. You know it is just the CPU pins going high and low in the computer. There is no pain of any conscious being involved. I also will assure you, if you do that, I will not consider you "evil".

How about killing a real dog? How about cutting off its legs and watch it "suffer" (judged from the image of the dog) for no reason. I think most people will have major problem with that. People may actually call the police. But why so? How do we know if there is any pain-feeling entity inside a real dog, while none inside a simulated dog? Can a real dog be just a biological automaton, not unlike the computer-simulated version on the screen, but just only biological?

In our folk psychology, however, we have always assumed there is something extra to the physical body of a real dog, haven't we? Otherwise, killing a real dog will not be such a big deal. But from neuroscience and biology, we also know that a real dog is just a physical biological machine because every single behavior it exhibits is traceable to the neurological underpinning of

the dog's brain. There is no physically unexplained behavior.

One point can illustrate very clearly what this extra thing is that causes our empathy. When you see a dog hit by a car on a country road, and you are just passing by. With half of its body crushed by the car, it is struggling and “suffering” badly. However, it still tries to move. It is making noise that you interpret as moaning. Realizing that this dog is not going to survive, you pull out your handgun and finish it off: mercy killing.

Why is it a merciful act on your part? What has benefited from your action?

Let's look at what really happened with the dog. When the dog's body was damaged, it triggered some reaction from the brain to try to avoid further damage, as its brain was programmed (presumably by evolution) to do, and tried to repair itself. It might have lost too much blood and its body temperature had gone too low, and it triggered a shaking behavior hard wired in the brain. Some neurons in its brain might just be processing the information from its sight and the combination of that with information from its past memory triggered a reaction to raise its head to look for a less dangerous place. But the process of raising its head was too energy intensive at this point that its muscles were too overwhelmed and its posture crumbled. We can describe

all these behavior of the dog as-a-matter-of-factly based on the science that we know. From a pure scientific point of view, and from a pure behavioral point of view, in fact, this is exactly what was going on inside this physically damaged system called the “dying dog”. What is the point of accelerating the eventual incapacitation of the dying dog? Why is the act of merciful killing merciful? Are we assuming something else? Are we assuming we are benefiting something extra to the physical body of the dog?

Of course, when you saw the dog shivering, you believed it was “in pain” because you projected yourself into the dog and knew (imagined) that it was in pain. You had temporarily assumed the identity of the dog (imagining taking its point of view) to reach such a conclusion. At that moment, you decided that if you were the dog, you would rather die and ended the pain immediately. To end the pain, for you, if you were the dog, would be beneficial to you. So, you considered that a merciful act.

The answer to who is benefiting from the merciful killing is the presumed existence of a fellow qualia perceiving agent inside the dying dog’s body just like you.

In the absence of that, your action cannot be explained. So, is it justified, or you are just mistaken because of our folk psychology?



When we dive deep into this kind of question, we will come to an awkward situation: What is the feeling for? What are the qualia for? What is it that the physical body is inadequate of, that some conscious being has to be looking from inside of a physical body, and to suffer through experiencing the physical body? Of course, if we live our lives void of feelings, it is entirely equivalent to not living. If there is no feelings, the association between you and your body is lost. Your body could have been someone else's body and you have no right to claim that to be your own, if you don't feel your body. But what is so inadequate about our physical bodies that they themselves cannot live alone as pure physical beings? A pure physical being without feelings (but with all the internal physiological signals intact and functioning) is a philosopher's zombie. Robots, in this sense, are zombies.

## **What are the feelings for?**

When a human body performs normal daily activities, like driving a car, going to work, talking to friends, etc., everything can be handled automatically like blood flowing through the lung: no one needs to feel anything about it. The brain is sophisticated enough that it can handle everything on its own, in the same way the kidneys are quietly handling the filtration of blood for toxins with no one being aware of it. Why is it then that when the brain is doing its job, it cannot do it quietly and automatically, but has to involve someone, some

consciousness? Why some part of the brain's activity is subconscious and other part conscious?

Let's examine what we mean when we say an individual is conscious. In medical terms, it probably just means responsiveness in a non-trivial way. But this is not what we mean when we talk about being conscious in the context of philosophy of mind. What we mean is that there is a qualia perceiving agent inside. Ultimately, having a qualia perceiving agent inside means "something that feels like us from the inside". A conscious being is someone who you can imagine being one. The flip side of the existence of a qualia perceiving agent inside a person is the lack of one. This flip side is a philosopher's zombie.

In fact, the other day I just had a zombie moment. I was taking a shower. I remembered going into the shower, I remember turning on the faucet. Then I remember I was thinking about something else (daydreaming). I also remember turning off the shower and I had finished taking the shower. I was in autopilot mode all the time while I was taking the shower! The process of taking a shower did not involve my consciousness.

Imagine the possibility of a person whose daily activities are all performed in autopilot mode. This person talks, reads, drives, creates, laughs, jokes, walks, eats, etc., all handled by the brain at the subconscious level. But this

person's brain is so special (maybe it is just a normal brain after all!) that even at the subconscious level, it does all these activities so well that no one can tell the tasks are being all done automatically. If you ask him to perform a crossword puzzle, he does it fast, but subconsciously. He is not even aware that he is doing it, but he does it and does it well. But of course, his brain knows what it is doing. The brain is aware of it, but the qualia-perceiving agent is not aware of it (more on this later in "blindsight" when the brain is aware of something but the person isn't). If you talk to him, the brain talks back to you. The brain handles all the input/output so well that the talking process never needs to rise up to the conscious level, and he is in fact not aware of it. He is as not aware of his talking as he isn't aware of his stomach just passing a piece of digested Tofu into his small intestine. In fact, this person lives his entire life subconsciously, but behaves normally from the outside, to the point that no one can tell he is different from you, a conscious person.

If nothing rises up to the conscious level the entire life, not even pain (the signals that normally represent the feeling of pain are there, but they are just handled subconsciously by the brain, including showing a painful expression on the face, and subsequently making a call to a trusted doctor if necessary), the consciousness might well be just not there. This is then a true philosopher's

zombie, as opposed to an almost-zombie in the case of a sleep-walker.

I hope you now get the idea. If you do, then we can rephrase the problem we have been discussing as: “Why aren’t we zombies?” Where are the zombies? An automaton is by definition a zombie.

So, what will the world be like if we are zombies? It will be exactly like the world before we were born, or after we die, i.e., a world in which we have no viewpoints. If we are zombies, then the “we” here refers to our physical bodies. And since we are not feeling the world through “our” bodies, any physical body can be “our” body because the association is lost, and therefore it is arbitrary. This is exactly the kind of world that we are not part of, if “we” are zombies.

A word of caution regarding terminology in the philosophy of mind discussion. Sometimes the word “self” is used by neuroscientists to describe the self image of the brain regarding the body, not in a first person way, but in a researcher-to-patient third person way. If what we are talking about is the first person perspective of the self, the existence of qualia, while someone is talking about a model he or she came up with showing how the brain may have worked by following such a model as if he is talking about a biological robot or the controlling program of the automatic vacuum cleaner, we are simply

not talking about the same thing. Talking past each other is a common problem in the discussion of the nature of the mind.

In this book, we are talking about the mystery of our own existence through our feeling the world. We are not discussing the mechanism of how the brain works and recognizes itself.

## **Subjective experience - the Qualia**

If we trace the route of the signal from the outside world into the brain, there does not seem to be a terminal point for the signal to get to for me to “get it”. The signal is always distributed into a region in the brain, resulted in a group of neurons firing or not firing. The mystery is, how does a group of neurons firing cause the subjective experience of someone? Some people see this as an explanation gap that we can never overcome.

If the above description of the problem is not clear enough, let’s look at another example for illustration.

Let’s say we build a giant robot, one that is ten times the size of Iron Man, the armored exoskeleton of a DC Comic superhero. This robot is a semi-automatic robot, and it needs an operator to function, pretty much like a car needs a driver. It can automatically balance itself, without the skill and micro-management of the operator (so that the operator is freed from having to prevent the robot from tripping all the time), like the way a human body can balance itself through reflex, without the need to go through consciousness, even though consciousness has the overriding power, just like the operator has the overriding power. However, the robot is not something that will walk from one place to another place on its own because it won’t know where to walk to, and why. It needs instruction from the operator on what to do,

because the robot is built that way. Once it has the goal given by the operator, it can accomplish it automatically. The operator room is built inside the head of this giant robot. The operator would drive the robot like driving a car. The operator can instruct the robot to extend its arm and pick up a piece of rock in front of it, for example. The robot has all sorts of advanced sensors throughout its skin, joints, interior plumbing of fluid hydraulics, etc., and the digital readouts are conveniently displayed on a screen inside the operator room. The vision of the robot is captured by two ultrahigh resolution stereo video cameras, and the video is projected onto a screen inside the operator room as well for the operator to see. You can see exactly what the robot “sees”, even with the sense of depth. You feel what the robot “feels”, by getting all the sensor signals. When you want to accomplish a certain task, a simple push of a button, or a simple movement of your arm, will result in the robot performing extremely complex task to your satisfaction. So, you are essentially the mind (or the conscious brain) of the robot, and the robot is almost like the extension of your body, just like the armored iron man suit of the Iron Man.

Now all the signals the robot gets terminate in the operator room. Other than those automatic capabilities such as auto-balancing that would not require your attention, all other signals required for decision-making come to you. In other words, you are not only the brain,

but you are in fact the consciousness of the robot (some people like the description “the conscious part of the brain” better). Anything that does not require your attention is “subconsciously” handled by the onboard computer (the subconscious brain). Any action that is commanded by you, it is a “conscious” action.

We can gradually upgrade the onboard computer so that it can handle more and more automation, so that it handles more and more task subconsciously, so to speak. Ultimately, the robot is even given the capability to set its own goal and is able to determine what to do on its own. From that point on, it does not need you to tell it where to go. It decides where to go. In fact, the robot is given only one goal: To protect itself from harm and survive for as long as it can. All the action the robot will take are derived from this goal: To survive. It (calculates) knows where to go to stay safe, drawing on a huge database in its computer. All it is required to do is to continue its own existence. Now, with a clear mission for the robot, you can imagine the robot will gather information about where the energy sources are, where the dangers are, etc., continue to expand its database, and it is able to map a course of action to stay ‘alive’. When its battery is low, it knows where to go to get recharged. When it comes across difficulties, it has the built-in artificial intelligence to deal with the difficulties. It can go on without any input from you, the operator. Now, with a completely



automatic robot like this, you have just become a passive passenger if you choose to stay in. You will be like riding a camel during a sand storm in a desert. The camel knows what to do to keep you both alive. With such an automatic robot, you can leave the driver seat all together and no one outside will notice that the operator is missing. The robot is now in autopilot mode and everything is handled in a “subconscious” mode, by definition.

Just like the robot is to our physical body, its computer is to our physical brain, this can and should happen in human as well. Our human brain, from all science can tell, is a highly advanced machine that it alone is more than adequate to handle all the requirements of the bodily needs, enabling a physical body to live its life. Why would anything rise up to the conscious level and require your attention? Why can't more tasks be handled by the unconscious part of the brain? In fact, why is some part of the brain “conscious” and other part “unconscious”.

*Why is some part of the brain associated with conscious feeling, and some part not? Why are you linked to some part of some brain, some brain that you identify as “yours”?*

This question seems odd to some people who have a deep commitment to identifying themselves with their brains. This question also seems to imply there is something else other than the physical brain, which is a deviation from

our materialism starting point, and the “everything is physical” argument. But to identify oneself with one particular piece of gray matter is not necessary logical either. If I tell you that if I pour the content of this test tube into another test tube under the microscope, you are going to feel a sensation of comfort, you will probably say it is impossible. But if I tell you that when this group of matter right here under my microscope start to get active, you will feel a sensation of relief, what will you say? You will probably say the same thing, unless I tell you that this is a group of nerve cell of your brain and I am looking at your brain. But why? What links you, the conscious self, the feeling self, to this gray matter that I am looking at? For me, as a third person, it is easy to understand because I am looking at a brain and when I see something happens in the brain, the mouth from the same head tells me there is a sensation of relief. I can understand from the third person’s point of view that the mouth is control by the brain I am looking at and I call that brain “you”. For me, a third person, a human head is no difference from a machine. Everything can be explained in terms of neuroscience. But, for you, isn’t the association of your feeling with this particular gray matter a little bit mystical? Why isn’t your feeling associated with other pieces of gray matter of some other brain, or even the two test tubes instead?

If you are confused by my question, let's get some clarification from the movie "The Matrix".

The concept of a Matrix is a virtual environment simulated by a giant computer. People are hooked up to this giant computer by some electrodes inserting into their spinal cord so that the computer can generate all sort of sensation for you. Given the right electrical signal, you will feel like you are in a desert, or you are eating a piece of chicken, or looking at a beautiful flower under a summer sun. Since the computer directly interface with your brain, you will be in a dream like environment and will be unable to tell that it is a virtual environment.

Inside this virtual reality environment, we are all given a virtual body (you have to, otherwise you will be bodiless). You can see and feel your virtual hands, your virtual legs, virtual clothing. At the same time, you can also see other people's virtual bodies as well, just like you will see other real body in the real world. In fact, this is how different individuals interact inside this virtual world: Through their virtual bodies, which are purely computer generated. We can imagine that if the simulation is as good as what it describes in the movie, we can be completely immersed in this virtual environment, unable to recognize that it is just a simulated environment, especially if you are connected to the Matrix since birth. Now, imagine a doctor performing a brain surgery on someone inside the Matrix and reveals that one's brain really is a mechanical

structure full of gears and springs, similar to the structure of a mechanical clock, with pendulum swinging back and forth. And when a certain spring in the head is pulled, the person under this brain operation is given a certain sensation of pleasure by the computer through the real spinal cord in the real world, and the person promptly reports inside the virtual world, "I feel really good..." Since this is a simulated environment, the computer can make any individual feel any way. But if the association of feeling is applied inconsistently, one may eventually recognize that it is fake by its inconsistency and self contradiction. As long as the rule is applied consistently, then people won't be able to recognize the hoax. The rule can well be that when anyone whose virtual spring is "touched", that person is given a sensation of pleasure. So, inside the Matrix, it becomes a well known scientific fact that the spring in the head is a pleasure center and people publish research papers about this fact.

Then comes along a wise person inside Matrix who is completely unaware of the outside higher reality. But he asks, "Why is my feeling associated with the pulling of this particular spring in my head?" You can imagine people inside the Matrix will look at this wise person with awe and point out to him the obvious: "It is your head, it is the pleasure center in your head, what else do you expect?" You can also imagine then that there are neuroscientists inside this virtual world who are experts in

the mechanical brain functions attempting to seriously answer the question by resorting to some deeper level brain gear mechanics and publish their findings in research papers. At the end, one question remains: why when those deeper brain gears are turned, the person will feel a certain way. Of course, we know that it is the computer sending signal to the real spinal cord. But if someone who is completely unaware of this higher reality where the real spinal cord is located, there can be no answer. There can be no answer from within the Matrix to this wise person's question. So, our neuroscientist in the Matrix, being a "materialist" inside the Matrix, has to resort to the final answer: "Of course your feeling is associated with this piece of spring. This is your brain!" Immediately, we see the problem with this answer. This is just a virtual body. But we also realize that no one inside the Matrix can refute this answer effectively because the "materialist" can always insist that one is to be identified with his/her brain (virtual brain) and there is no problem with that. But being outside of the Matrix and knowing that what is being "touched" is just a simulated virtual body, we know that the wise person is asking a good question inside the Matrix. Indeed, without the "real" reality, one simply cannot explain why touching a spring in one's "virtual brain" will cause the sensation of pleasure. People inside the Matrix simply cannot know of the higher reality outside, and so their explanation, whatever it is, cannot be the real explanation. Insisting on

identifying one's nature with the virtual body is therefore committing a serious logical error in reasoning.

But then, aren't we having the same explanatory gap in our "real" world as well? Why when some signal reaches a certain part of my brain, I will get this sensation? To explain that, don't we need to invoke some even higher reality? Otherwise, how else can I explain through this gap? And then to explain the higher reality, don't we need another level of even higher reality? Isn't it an infinite regression? At the end, we still have this explanatory gap. Welcome to the hard problem of consciousness!

## **We don't think, we are only given the feeling and illusion of thinking**

In 1982, Benjamin Libet showed that there is a subconscious decision-making process inside our brain before our consciousness is notified, which then embraces the decision given to it as its own. In this well-known experiment, people were asked to press a button as soon as they had made up their mind to do so. Electrodes were attached to the subjects' scalps to pick up electrical signals from inside the brains. It was found that there was a time delay between a so-called readiness potential rising, as recorded by the electrode, and the time when a subject reported to have conscious experience of having

made up his mind to press the button. The time delay was rather short, only slightly less than one second. The time lag existed both when the decision was to immediately press the button (the unplanned case), or just a decision to press the button in the next few seconds (the planned case). By looking at the readiness potential, a scientist can tell in advance whether a person is going to push the button or not, a few hundred milliseconds before the person himself is even aware of it.

The Libet experiment has been refined recently by a group consists of Chun Siong Soon, Marcel Brass, Hans-Jochen Heinze and John-Dylan Haynes using brain scan technique. In the abstract of their paper published in Nature Neuroscience (Vol. 11, 543 - 545 2008), they wrote, "...we found that the outcome of a decision can be encoded in brain activity of prefrontal and parietal cortex up to 10 s before it enters awareness. This delay presumably reflects the operation of a network of high-level control areas that begin to prepare an upcoming decision long before it enters awareness."

A full 10 seconds in the subconscious brain before the conscious self is even aware of it! That means, there are a lot of things going on inside the brain that you are not aware of. But after a decision has already been made by the low level brain, you get a feeling that you have just made up your mind consciously. You think you consciously make the decision, but closer to the truth is

that you were given the decision made by the subconscious brain, and you embrace it as your own conscious decision, up to ten seconds after the lower level brain has already decided. Now those subconscious decisions are visible through brain scan and the measurement of the readiness potential.

A picture of the decision making process emerges from these experiments: Our conscious self is being notified of the decision rather than participating in making it. This picture is consistent with the feelings of some scientists who reported that their brilliant ideas sometimes just pop out from nowhere. Sometimes the solution to a problem that has been worked on extensively also seems to just reveal itself. It is not sure in these cases what the role of the conscious mind is, other than just being at the receiving end of a solution the lower level brain has already worked out. The question is, why can't the brain that comes up with all these wonderful solutions just get on with its own business and use the solution as intended without the consciousness being notified? Sometimes in problem solving, our consciousness seems to be given an intermediate solution, and then sometimes later, the final solution emerges as well, giving you an illusion that you somehow consciously take the intermediate step, and use it to arrive at the final solution. But sometimes, a final solution is arrived at without any intermediate steps. In this case, the consciousness is not even notified of the



intermediate steps, and is simply given the final answer. Why can't the utilization of the "final" solution be also handled subconsciously, similar to the way the presumably existing intermediate solution is being handled, but not revealed, in the case when only the final solution is given to the consciousness? If the utilization of the final solution is also handled subconsciously, then there will not be any need for the conscious awareness of what has happened. As such, one solution leads to next solution, one action leads to the next action, each being a final solution on its own, but is also an intermediate step of something else in a grander scale, and life goes on below the conscious awareness. Why does the brain have to generate conscious experience at all? Why can't it handle its own function like the kidney handling its blood filtration function without the awareness of the consciousness? The more one thinks about these types of questions, the more conscious awareness seems mysterious.

The brain has an innate capability to maximize an individual's survivability. It sets it's own goals, and it accomplishes them on it's own. In fact, from all what science can tell, as what I illustrated in the Section *A case for "everything is physical"*, there seems to be no "driver" in us other than the brain because everything is physical. So, why aren't we all automata? Why should the consciousness get involved? We seem to think, but

we don't. Our brain does it for us, and then we are aware of those thoughts. The question is why should we be aware of those thoughts. Why can't the brain do the thinking quietly? What links us to those thoughts?

In the case of the giant robot, once you, the driver, leaves the driver seat, once everything is handled by the robot's computer at the subconscious level (by definition), "feelings" cease to exist, and the robot is indeed an automaton.

However, in human, we have qualia! At least I do. And I hope and believe you do as well.

There is only one possibility, you stay on as a passenger in your body for some reason and keep getting those inputs!

Now that we have gotten ourselves into this interesting analogy, let me ask this question: Shouldn't there be a screen somewhere in our brain that our consciousness is watching? In a similar way, don't we have a consciousness sitting somewhere inside our brain and watching the screen in our mind, and when an event is registered with this screen, we experience it? Otherwise, where is the termination point of all those nerve signals? Who is receiving all those signals? How does it all result in qualia?

Philosophers have long imagined a homunculus sitting inside our brain forming a little self, watching the screen. Philosopher Daniel Dennett called this mind-screen the Cartesian Theater.

However, homunculus is a self-contradicting concept because it leads to infinite regression. If there is a homunculus inside our brain that is responsible for our subjective experience as the nerve signals reach our brain, unless the homunculus is an indivisible point, we would need another homunculus inside this homunculus to process those signal that gets into this first homunculus. If not, we would run into the question of how the homunculus's receiving the signal would result in subjective experience. At the end, we will need infinitely many level of homunculus to make this concept self-consistent. This type of infinite regression is even more problematic than the original explanation gap problem.

Just as we have seen inside the Matrix that to identify one's own nature with his/her virtual body is committing a logical error, to identify our nature with a piece of grey matter that we call "our brain" is committing the same logical error. But if I cannot identify myself with my brain, what can I identify myself with? Is it possible that I can be identified with some other brain and become someone else? Therefore, it begs a related question: Can I be you instead? Could I have been born into your family, with your DNA, taking your place in the world

while you take mine? Is this question “What was the probability for me to have been born as you?” a meaningful question? Of course, doing that in the Matrix is easy. You can be given a different virtual body and put into a different position (family) while somebody else takes your place. Instead of being a carpenter, you can be a middle manager in a bank, or vice versa. All is needed is to give you a different virtual body and insert you into a different virtual family at birth, and you will be on your way to becoming somebody else. It is all just a gigantic simulation environment anyway. But in real life, is this question of why I am me instead of you even meaningful? How was the relationship determined? If “your” brain is generating my qualia, and “mine” generating yours, can we tell? Won’t we just identify each one’s brain by “convention” (more on convention in the “Problem of inverted spectrum” below), and by definition? If we swap qualia from time to time, can we tell?

There is one crucial difference between the virtual body in the Matrix and the real body in the real world though: In the real world, we have the real brain keeping track of our memory. However, in the Matrix, our virtual brain is only a narrative and it does not keep track of our memory. Our real brain in the real reality does. So swapping qualia with someone else from time to time is impossible because then the memory will not be consistent. However, if the interface between our brain and the

Matrix computer is so complete that the Matrix computer can actually implant or delete memory into our real brain, then even swapping life experience with another individual inside Matrix will be possible. Switching identity will be seamless because inconsistent memory can be deleted and needed memory can be implanted on-demand and on-the-fly.

So, if there is an even higher reality, swapping qualia, could be happening without our noticing it in our real world as well, why not?

## **The hard problem of consciousness**

How does the material brain generate qualia? Or does it? There seems to be an unbridgeable gap between the two if we stick with the pure materialist view of the world.

This explanation gap is a well-known problem some refers to as the Hard Problem of Consciousness. This is a term coined by an Australian philosopher David Chalmers in the 1994 first Tucson Conference of Consciousness, in which he thought he was just stating the obvious, and he meant that to be the prelude to his speech before he went on to say something more profound. This was told to Susan Blackmore in an interview, transcript of which was later published as one chapter in a book “Conversations on consciousness” edited by Susan Blackmore. To some people, including this author, what Chalmers stated was

indeed quite obvious. Obvious to some, but nonetheless, not obvious to many, and therefore becomes quite controversial. It has been opposed by many relatively well-known philosophers such as Daniel Dennett. Supporters from both camps accuse the opposite side of “not getting it”.

The hard problem basically recognizes the problem that no matter how well one can understand the chemistry and neuron firing pattern of the brain, there seems to be no path to make a connection between those brain processes to the existence of subjective experiences of some conscious being.

If there is a hard problem, there must be an easy problem, right? Yes. In fact, there are many “easy” problems. The “easy” problems, in Chalmers’ definition, are those difficult problems studied by neuroscientists, psychologist, psychiatrists, and other researchers who try to understand how the brain works, how the brain structure affects the behavior of an individual under study, how the difference in the brain causes homosexuality, how the part of the brain affect ones ability to navigate one’s social environment, how it changes one’s moral view, how seizure occurs, etc., like those described in *A case for “everything is physical”* in Section I. They are easy in a sense that they can be studied with a researcher standing up and a subject lying down. They can be studied using the third person point of

view like a scientist studying an atom, and the scientist won't find himself being that atom.

However, the hard problem is hard because it is the researcher studying himself (or herself), trying to understand the mechanism by which his brain is generating his own private experience. And even though he may obtain a lot of data knowing what electrode inserting in what part of the brain will give him what sensation, it does not seem that there is a way to understand those correlations. Questions like why I feel hurt when I slap my own face cannot be answered. If you further explain that in terms of those nerve cells transmitting the "hurt" signal to your brain, then why when those signals reach the brain it feels hurt? If you even further explain it in terms of even more elementary processes occurring inside the brain, you are going to end up with neuron firing or cell connections or some other yet unknown physical processes, but then you still have not answered the question why when those elementary processes occur, you feel hurt. You are no closer to the truth with those "elementary processes" than with the simple fact that when you slap your face, you feel hurt, as has been recognized by the "wise man" inside the Matrix in the section above.

Incidentally, let me point out that at a different level, say if we are writing a drama, and not a scientific or philosophical investigation, the fact that you slap your

face is the elementary “explanation” for your face feeling hurt. No deeper explanation is required, that is, for a drama writer.

Some did point out that one reason we have an explanation gap is simply a problem of what we mean by an explanation. In fact, looking at our knowledge of the physical world, even from a materialist standpoint, there are gaps everywhere. An explanation ceases to become an explanation if one follows up with another question at a lower level. For example, when we strike one billiard ball with another billiard ball, and send it rolling while the striking billiard ball comes to a stand still, the explanation is eventually just a law: because it is so. The explanation of why the ball at rest is set into motion is that there has been a complete transfer of momentum during that elastic collision. But one can then ask, why is there a collision in the first place? Why can't the balls just pass through each other? The answer, from science, will be because they are made of solid material and two pieces of solid material objects cannot occupy the same space at the same time. Then, why can't two solid material objects occupy the same space at the same time? For that we have no explanation. It is just a fact. It is just a fact that we know from experience. It is a law of nature. So, we just have to accept it as is. One may attempt, in fertile, to answer the question in terms of atomic structure that we know about and the electrostatic repulsion between two



atoms when they get too close: the mutual repulsion of the two electron clouds. However, this is not necessarily the explanation either because in chemical reaction, the electron clouds from the reacting atoms occupy the new molecular orbits formed when the atoms getting “too close”, and literally binding the two atoms together (think of the C-H bond in organic compounds). At the end of the day, one will have to resort to Pauli’s exclusion principle which states that two identical fermions (which electrons, and nucleons are) cannot occupy the same state, thus cannot occupy the same place at the same time. But why is it so? At the end, we still just have to accept that this is a fact in our universe and we don’t have an explanation for that.

A slightly different, but similar example of having gaps in our scientific explanation is “why  $1 + 1 = 2$ ”? Well, again, it is an abstraction of our experience in this world. It is because when we put one object and another object together, we call that group “two objects”. See how unnatural I had to put the words together? I would have said when you put two objects together, that is what we mean by two. But since I am explaining why  $1+1=2$ , I had to say putting one object and another object together, to avoid using the word “two” before it was defined. So, in essence, why  $1+1=2$  is a matter of definition, our definition, and we take that as fundamental where no further explanation is required or possible.

However, is the existence of our consciousness falling into the same category?

We claim that if we take the first person point of view, no matter what elementary processes we find inside the brain, we cannot get an explanation on why we feel a certain way when those processes are taking place. Indeed, brain processes are physical things, while feelings are mental things. They are in different realm. How one can cause another is a complete mystery. At best, we can find some correlations between those elementary processes and our feeling a certain sensation. When I am feeling a certain sensation, and if you go to look at my brain, you will find those processes happening, and if you find those processes occurring, I will tell you I am feeling certain way. So, these are correlations. But correlations are just correlations. Correlations are far from being explanations. It is like whenever we find John is in a good mood, Mary is always in a lousy mood. We don't know why, but it just seems like the two always occur hand in hand. That is, they correlate. But it is not sure if John's good mood is causing Mary's bad mood, or the other way around, or both are caused by some other unknown external factor such as the weather.

Since correlations are not explanations, there is still an explanation gap between consciousness and the brain.

But is this type of gap the same type as those when we ask why two pieces of solid cannot occupy the same space? We seem to be perfectly happy about taking “two pieces of solid cannot occupy the same space at the same time” as fact and stop the questioning there, but it feels completely inadequate to simply take “I exist” (or “I am conscious”, or “I have qualia”) as fact and stop asking at this level. The reason, I believe, is because facts in general are atemporal. Two pieces of solid objects cannot occupy the same space at the same time is as true today as it has been, and as it will be. However, the “fact” that “I exist” being true today may no longer be true in 200 years, or 200 years earlier, materially speaking. This “fact” can change. The “fact” that changes over time needs explanation. Why the change? I still want to know why I exist now. I still want to know what brought about my existence from a state of non-existence. And that is where we fail to find a satisfactory explanation, and that is the hard problem of the philosophy of the mind.

One can see clearly that if we were immortal, then the question of “why I exist” goes away. It is just fact. Even if we are talking about a virtual world like the Matrix, if the Matrix is forever, and we are immortal inside the Matrix, that is, if our association with our virtual body in the Matrix is permanent, permanent in the sense that it will not change over time (from the Big Bang to the end of time), we can still comfortably identify ourselves with

our virtual bodies because the association is permanent. If you are the king since the beginning of time, and will ever after, then your nature is the king. Kingdom is your nature. There is no need to find out how you become king because you have never been not-king, and the attempt to find out how you became the king lost its meaning. Therefore, one can comfortably accept “I am the king” as fact, and stop looking for an explanation. However, if you are only the king in a limited time span, then how you got to be the king is a legitimate question and an explanation is warranted.

Perhaps the explanation of our existence has to come from our mortality.

## **The problem of inverted spectrum**

Let's say you have two good eyes. But the sensations of both eyes are very different. When the right eye sees red, your left eye sees green. And in general, the two eyes give you different sensation to every color (generally speaking, the brain will merge the color sensations from both eyes into some combined color, but this is not the accent of this discussion). The question is: How can you tell what color an object “actually” is? One way to find out is to ask someone else. If every body says it is a red dot, you call that a red dot. Even though your left eye gives you the sensation of a green dot, you still call it a red dot, just by convention.

But how do you know if other people have both eyes like your right eye, or have both eyes like your left eye? You cannot tell. It just happens that you have both kinds of eyes. And the sensations from both eyes are direct experiences accessible to you and you only, so that you can compare them directly. But suppose if you only have one kind of eyes, say, the right eye type, would you have imagined there are people out there who have the left eye type eyes and feel the color differently?

Actually, there may be more eye types out there than we know. Maybe it is not the eyes at all. Maybe it is really the brain that is causing all these difference in color qualia in different people. We don't know. For now, we can only assume my red quale is your red quale, and is everyone's red quale. But our private experiences are mutually isolated.

But this mutual isolation will not hinder our communication in general because our conventions are all anchored in the external physical world that is commonly shared. To describe some taste, we may say it tastes like apple, a rather common fruit most people have tasted before. We calibrate the description of our feelings to the external world, and we describe one feeling in terms of another, but always in isolation with respect to other people's actual feelings.

However, without given it further thought, most people would assume we all have the same internal sensation toward the same stimulant. In fact, there is indication that 20% of the population don't understand, even after being explicitly told, that communications regarding our internal feelings are based on conventions.

One interesting thought is perhaps the sensation of red color to Person A is like the sensation of green to Person B, and the sensation of purple to Person C and so on. They all like the same color experience, but just that the same experience has to come from different colors for different individuals. Maybe that is why each person's favorite color is different.

This is the inverted spectrum problem. We just don't know what other people really feel.

If the internal feelings of other people are permanently locked away from us, without being that person, how can we know they even have feelings? May be they are just automata! Even though we tend to assume that there is something extra, the feelings, in addition to the physical body, maybe other people are just biological robots. How do we know? That is the problem of other minds.

## **The problem of other minds**

Even though we tend to assume that when we are dealing with a conscious being, we are dealing with some consciousness which is over and beyond just the physical body. The fact is, no one can convincingly prove to you that he or she is conscious in the sense that he/she is more than just the physical body and has subjective feelings internally like you do.

Psychologically, we always like to believe that there is more to a whole human than just the physical body, the existence of a conscious feeler in each one of us. If someone gets hurt, we feel bad for that poor person. However, feeling bad for another human being, from a scientific point of view, is entirely not necessary. The facial expression when one gets hurt is just a result of the neural reaction to the stimulant, not unlike an automatic vacuum cleaner's reacting to its environmental stimulant. Why feel bad at all? It is all just a physical body responding to some environmental change. There is simply no way to verify that subjective experience exists inside this "hurting" body.

Even if you can go into a conversation with this person, even if he or she talks intelligently and emotionally, you still cannot be sure there is subjective feeling inside. A computer can be programmed to respond emotionally as well. A full-blown material human brain can definitely

behave very human-like even if it has no feeling inside. So, entering into a conversation with someone will not get you anywhere closer in terms of verifying the existence of subjective feeling within any individual. This is the problem of other minds.

Maybe you are the only one who is not a zombie!

This form of thinking is very close to solipsism. Solipsists believe they are the only ones that are real. They believe everyone else is an illusion, including their fellow solipsists. Nothing wrong with this thinking, but it is just unpleasant to be the only one inside an illusion.

## **Zombies could really exist - Sleepwalkers**

Some people can perform extremely complex task during sleepwalking. Cases have been reported that sleepwalker can drive around safely in a car. However, it is not sure if people are conscious while they sleepwalk, conscious in the normal use of the word, and in philosophical sense. If indeed people are unconscious during sleepwalking, this is as close to an unconscious automaton doing complex task in a normal way without consciousness being involved as one can get. A sleepwalker is almost a zombie.



Two types of sleepwalking have been reported. In the first type, people remember what it was like during sleepwalking. Some people remembered mistaking the dresser as the urinal. Some remembered some sort of screwed up logic that at the time seemed to make sense. This first type of sleepwalkers merge the dream realm with reality and the sleepwalkers were able to recall some of the experiences, not necessarily clearly. Another type of sleepwalkers reported no memory of whatsoever had happened. Some even got woken up during sleepwalk and immediate was at a loss of why he or she was in the situation he or she was in.

A related condition to sleepwalking is sleepeating – people who get out of bed at night unconsciously to prepare food and eat, then go back to the bed again to finish off that night's sleep. Some of these conditions are health related, and some are medications related. Here is a story reported on WebMD.com, by Daniel J. DeNoon for WebMD Health News, in 2006 relating sleep eating to a sleeping pill Ambien:

“March 15, 2006 - New reports appear to confirm weird behavior in patients taking Ambien, the world's most popular sleeping pill.

Perhaps the strangest of these behaviors is sleep eating. It was first reported in 2002 by Michael H. Silber, MD, co-director of the Mayo

Clinic Sleep Disorder Center. Silber is the president-elect of the American Academy of Sleep Medicine.

"What happens is the patients get out of bed, walk to the kitchen, prepare food -- often sloppily, and often with strange, high-calorie ingredients," Silber tells WebMD. "They have microwave food sometimes. They eat in a very sloppy way, either in the kitchen or after taking the food back to bed. And they have no memory of it. They wake to find a mess in the kitchen or crumbs in the bed."

In each case, Silber says, the patient took Ambien as prescribed. At the time of the 2002 report, Silber had seen no more than five cases. He now has seen some 20 cases of sleep eating in patients who took Ambien as directed.

"It could be injurious -- but I have not had anyone who set the kitchen on fire," Silber says. "The most important thing is the severe embarrassment and discomfort these patients experience. And some put on a lot of weight due to high-caloric sleep eating. We have some

patients who have had it happen often -- in one patient, more than once a night."

Obviously, this kind of sleep eating is probably caused by medication. In these cases, the preparation of food was often done *sloppily*, to quote from the original article. However, what if there are medications that induce sleep eating disorder, but the patient prepares food "normally", but unconsciously? When complicated food preparation process proceeds "normally", other people may just be unable to tell if the sleep eater is actually unconscious. If we cannot tell about a sleep eater, can we tell about a "regular" person sitting next to you?

It is still possible that sleepwalkers / sleepeaters are conscious during their episode, no matter whether they can recall or not afterward. It is possible that they are in a dream-like realm and having a set of dream-like qualia. Just like many dreams, the content is partly or totally forgotten by the time the dreamer wakes up. So, possibility of conscious sleepwalker and sleepeater still exists. However, it is also entirely possible that qualia are indeed absent in some sleepwalking cases, that is, the sleepwalker is truly unconscious. If this is the case, a sleepwalker is a true automaton without any subjective experience, i.e. a true philosopher's zombie.

## **Real life example of the brain handling things without the person knowing it - blindsight**

I have this experience that when I have to go do something else in the middle of reading a book, I always fold the upper corner of the page I am reading so that I can return to the same page later. But I had no intention of remembering which line I was in. I always thought this would be relatively easy to figure out by reading few words here or there when I return. However, whenever I returned to a book, I always seemed to be at a loss on which line I was reading, and started to blame myself for not marking the line as well. But strange thing happened most of the time: When I laid my eye on a randomly chosen line to try to pick up where I left off, I always picked up the right line! I kept telling myself it couldn't be true. But a lot of time, my brain just seemed to remember where I left off, without me knowing it. I will call this subconscious knowing. It is probably an example related to a phenomenon called "blindsight".

Blindsight was discovered and reported by Weiskrantz in 1974 when a patient with a brain tumor needed treatment and the occipital cortex was surgically removed from his brain. After the surgery, the patient became blind in some area in his visual field. The patient would report no visual experience when object was shown inside this visual area.

Despite reporting not seeing anything, if he was forced to guess, and only if he was forced to guess, for example, whether the object was a triangle or a circle, yellow or black, he was able to give answer far better than 50/50 chance if it were pure guesswork. The accuracy seems to improve with time as well. This indicates that despite the lack of awareness, the brain knows the relevant information. Even though the subject insisted that it was pure guesswork, statistics showed otherwise. It was subconscious awareness.

Imagine when someone tosses up a coin and ask you to guess head or a tail. Imagine the surprise you have when you realize that 95% of the time you guessed it correctly! You look at the statistics. Indeed, roughly half of the time the toss resulted in a head, and half of the time, the toss resulted in a tail, just like a random game. Then you look at your guess. When it was a head, you guessed head most of the time. When it was a tail, you usually guessed tail. How is that possible? This is precisely the experience of a blindsight patient.

Since the discovery of the first blindsight patient, more have been discovered. The study on the first blindsight patient continued up until very recently. It then became clear that there were two types of blindsight test conditions: Type I and Type II. In Type I, the patient has to be forced to give an answer or else there is no volunteering from the patient because there is no

sensation associated with the knowledge. This happens for slowly changing things. While in Type II, when some event happens suddenly, such as a ball rapidly changing its position inside the blind field of the patient, the patient actually has a vague feeling of something has just happened, but does not know what, and subsequently the patient is able to “guess” correctly. If the ball is coming right at the patient, he may even be able to reach out and catch the ball with his hand.

In a PBS documentary film NOVA “Secret of the mind”, aired in 2001, a person named Graham Young was shown together with V.S. Ramachandran, a psychologist and a neural scientist, some of whose work was featured in the documentary as well. In the program, Ramachandran was shown doing some test on Young’s vision. Young suffered a head injury as a child, and that rendered him blind in his right hand side visual field. Both eyes were affected. He said he would literally run into lamp poles right after he suffered the head injury at the age of eight. Since then, he had gotten better control of his blindsight, and was often able to guess correctly what was in the blind field even though he lacked the sensation of seeing them. Now he could frequently “guess correctly” (his own description) if an object was changing position inside his blind field.

During one test in the documentary, an object (Ramachandran’s hand) was slowly moving from the

right hand side on a screen, where Young had no vision, into the left hand visual field where Young could see. At first, Young said he could not see it. But as soon as the hand crossed the middle line, Young told the doctor that he could now see it. The boundary of the visual field was quite well defined. The curious thing is when the doctor moved his hand back into the right half of the screen so that Young could not see it, and moved his hand quickly up and down, Young was able to tell that it was moving up and down. The doctor said, "So you can see!" "I know if I tell you, you are going to say I can see, but I can't." Somehow, his brain just gave him a feeling of something vague, and then he was able to "guess" that something was moving up and down. However, he had no idea how he was able to "guess" it correctly, perhaps similar to the way I was able to guess the correct line in a page where I left off.

Blind sight was caused by damage to the visual pathway that go into the visual cortex, while the other path way that goes through the brain stem is still intact. With the visual cortex not getting the signal, there is no conscious experience of seeing. However, the other pathway, which controls reflex, can still transmit the light signal into the upper part of the brain, and influence the body in that regard.

The significance of this blindsight phenomenon is that you can "see" without experiencing seeing it. Or put it in

another way, the brain can process the information and react to it without your knowing it. When you need the information, such as when you are being forced to guess in the Type I case, you can often “guess” correctly. The knowledge comes to you as if you are guessing.

How does blindsight fit into our discussion about living unconsciously in autopilot mode so far? It shows that the brain can acquire information, which then becomes available to the brain, but without the consciousness being involved. Therefore, no qualia associated with the knowledge. The phenomenon of blindsight does make unconscious living seem more plausible.

## **Blindsight combining with Alien Hand Syndrome**

However, there is another type of brain injury that causes the exact opposite to happen: Action that completely bypasses consciousness. This condition is called the Alien Hand Syndrome. Sufferer of this symptom often has a hand suddenly acting out on its own, such as pulling out one’s own hair, pinching one’s own face, spilling coffee, and etc.. During normal times, the “alien hand” can act in concert with the rest of the body, obeying the order of the conscious person. But when the condition is right, such as in the appearance of a comb, the hand will be triggered into reaching out to the comb and comb the



hair compulsively while the person is unable to hold back the alien hand.

Somehow, if we know the neural mechanism of how this works, one may be able to combine blindsight with the alien hand syndrome (on the legs), and engineer a brain wiring so that when a lamp pole is near, the legs start executing the evasive action and go around the lamp pole on their own, without the consciousness even getting involved. If we achieve that, the consciousness will not have seen the lamp pole, but will notice that the legs carry him in a sideway direction before moving forward again, automatically avoiding hitting a lamp pole. The consciousness will simply be carried around by the physical body without even knowing what has happened.

The combination of “blindsight” and “alien hand syndrome” shows us that there are indeed external tasks that one can perform subconsciously, in the true sense of sub-consciousness.

The combination of Blindsight and Alien Hand Syndrome does assume that there are neurological differences between a “normal” brain and a brain that combines these two effects. So, it assumes that there are differences in neural wiring between a brain that causes sensation and one that causes no sensation, even both brains can cause the person to not run into a lamp pole. But what is the

exact mechanism in the brain that does cause conscious sensation to cause the conscious sensation?

How do we even know that the person reporting having no conscious awareness of the sight sensation is actually having no sensation? Why should we trust his words? Instead of blindsight, let's say we come up with a way to re-wire the brain to engineer a brain condition call deafhearing: a person can hear the spoken words while having no sensation and awareness of hearing them. In addition to that, we may engineer a condition call Alien Mouth syndrome similar to Alien Hand syndrome. The only difference is instead of the alien hand compulsively grapping the comb and comb one's hair, the alien mouth will start talking compulsively under the right condition. Just like the way we combine blindsight and alien hand syndrome, we combine deafhearing with alien mouth syndrome. As a result, we created someone who can respond to spoken question and respond to the question by talking, without the sensation and awareness of hearing the question or talking in response to the question. Imagine someone who is able to listen to your question and talk back to you but he himself does not have sensation and awareness of the hearing part or the talking part. That will be an extremely interesting condition. Since this person now cannot report his lack of awareness of what he is talking about by saying he has no sensation because his speaking is controlled by his alien mouth,

which automatically responds to your question with some answer, by-passing consciousness altogether. If you ask him if he can hear your question, he will of course say yes because he is responding. So how will you know that he really does not have the sensation of hearing your spoken words? One way to do that is to leave a way for his consciousness to communicate by written means. We can rewire his brain so that even though he has deafhearing and alien mouth syndrome, he still can read and write consciously. So, while his deafhearing and alien mouth is responding to your spoken question, his hand writes about his lack of awareness of what he is talking about.

But let's get one more level down and rewire his brain so that his writing is now tied to the response of his alien mouth instead, i.e. restoring his alien hand and his blindsight. Now in response to your spoken words, he will talk back. In response to your written text, he will write back, but doing so completely void of any sensation of his own involvement. Suppose you can wire his brain in such a way that his response looks normal and consistent, what will you have? You just engineered a zombie! You have just engineered someone who can "communicate" with you while having neither any sensation of hearing and reading the input nor talking and writing the output! The entire communication process has by-passed consciousness.

But can you tell that this is a zombie from the outside? Maybe you can't! If the engineering is done so well that the unconscious part of the brain is set free in autopilot mode, and if it can utilize all the brain power in response to external stimulants, then it may just response to everything normally, minus the sensation part.

Again, we still assume that there are neurological differences between a "normal" human brain and such an engineered zombie brain. But if one cannot tell the difference from the outside whether internal sensation exist, how can we tell which wiring is the "normal" wiring?

That brings up the old questions: What is consciousness for? What are qualia for? We still don't know why "we" have a point of view to witness what "our" body is going through at this point in space and time, even though physically our body is quite capable of carrying out its own normal activities without us being aware of any of them.

In his book "The origin of consciousness in the break down of the bicameral mind", Julian Jaynes argued at the very beginning of the book what consciousness is not:

- 1) Consciousness is not a copy of experience
- 2) Consciousness is not necessary for concepts

- 3) Consciousness is not necessary for learning
- 4) Consciousness is not necessary for thinking
- 5) Consciousness is not necessary for reasoning
- 6) Consciousness has no location

I think his observation is consistent with what we have discovered so far. We may just conclude that consciousness is not necessary for living as well. What is consciousness really for?

It is probably the right place in the book to point out that there are two kinds of Zombies: From the above discussion about blindsight, even if all qualia have disappeared from a conscious person because of brain damage or structural change, and he lives his life without experiencing it, we are still assuming the existence of the consciousness, only that it does not interact with any sense organ and it is not aware of the brain processes. The consciousness simply becomes a tag-along passenger of the body without feeling the body, like a passenger who has fallen asleep in a car. However, in earlier discussion, we came across another concept of zombie that the feeler is completely absent but the brain is normal with normal neuron networks and neural signals, but just that they are not picked up by a feeling agent, thus

becoming a zombie. It is not sure if this conceptual differentiation is useful, as the lack of qualia or sensation is the characteristic of both types of zombies.

## **What is consciousness anyway?**

At this point, we come across a concept that often leads researchers of philosophy of mind to talk passed each other: What exactly do we mean by consciousness? Some people believe only human beings are conscious. Some believe all higher mammals are conscious. Some further extend consciousness down to insects like ants. And then there are people who believe even computers are conscious, given sophisticated enough software. And then to top it all off, pan-experientialists (panpsychists) believe everything is conscious, it is just a matter of degrees. So, what is going on? After hearing so many opinions, one may wonder if these people are even talking about the same consciousness.

Just as the problem of other mind shows, the mind or consciousness is not a third party observable. From the outside, a conscious being and an automaton have no fundamental difference. Strictly speaking, all humans are automaton, but only you are conscious. I may appear to be conscious to you by the writing of these paragraphs, but some automatic writing software have been shown to be capable of writing decent articles, especially in sport writing where scores can be automatically turned into a

descriptive articles. How can you be sure that I am really conscious? In view of recent reporting of a sleepwalker wrote and sent out some email during his sleepwalking episode, it is even less clear if the ability to type in some sentences can be a proof of consciousness. What exactly can you mean by saying someone is conscious?

If one cannot distinguish from the outside if a person is conscious or not, how do we determine if there is consciousness inside other people? That is the arbitrary nature of the definition of consciousness.

Ultimately, when someone claims that something is conscious, what he really means is he can comfortably imagine being that something, and imagine what it is like to be that thing from within.

Those who claim that computers are conscious feel very comfortable imagining being a computer. People who insist that consciousness is a result of computation can easily imagine themselves being an algorithm located inside a piece of computer hardware. Apparently, many people can imagine being uploaded onto the Internet and happily live on the Internet ever after. If you can imagine yourself “living” on the Internet in the form of “1”s and “0”s while your discussion partner cannot, you two will never achieve communication. All you can do is keep talking passed each other.

The result is different people imagine different things, and use the same word “consciousness” to describe what they are imagining. When the communication fails to establish, accusation of the other side not getting it is ensured.

If you use the word “consciousness” the way I do, you automatically follow what I am writing. If you have a different understanding, then my discussion will always sound hollow.

## **The disappearance of the qualia perceiving agent and the discontinuity of consciousness**

Let's point out that even in the same machine with a feeling inside, namely, the human body, the feeling can disappear instantaneously at the loss of medical consciousness. According to animal lovers, the humane way of slaughtering a pig is first to make it unconscious, and then kill it. First, you drive away the feeler. Then in the absence of the feeler, it becomes more humane to stop the function of the physical body, because then it involves no pain.

So, where does the feeler go when one loses consciousness?

Or maybe the feeling agent is still there, but just that it got dissociated from the brain process because of the brain



change similar to the case of blindsight, and it provides no qualia? Without qualia, it has no sense of the passage of time, and therefore appears to be not there?

If the feeler really disappears when one loses consciousness, and it can reappear when one regains consciousness, is the feeling agent real? Or is it just an illusion? Have we introduced a useless concept: a qualia feeling agent and are now finding it can pop in and out of existence?

On the other hand, if the feeling agent stays on, but is just dissociated from the brain process during the period of unconsciousness, what does that say about it when the brain disintegrates, as in bodily death?

This second case kind of guides us back to the dualistic mind-body concept of Descartes’.

What is the nature of this qualia feeler within us?

Before we explore this question, we will take a detour and investigate “computer consciousness”.

## **Digital computer cannot have qualia and why**

At last, we turn to digital computer, of which the question of consciousness confuses a lot of people, among them the many experts working in the field.

Can a digital computer have qualia? “Qualia” is a plural word that describes the quality of the subjective experience, as experienced by some conscious being in a first person perspective. The focus is on “first person perspective”. I use qualia interchangeably with the word “feelings”, and “experience”. The quality of the redness of the red color as perceived by a conscious being, the painfulness of the pain as perceived by a conscious pain feeler, etc., these are what I mean by qualia.

Can a robot have qualia? Or for that matter, can a digital computer have qualia. My answer is no. They cannot. An algorithmically controlled digital computer cannot have qualia. I will reserve my judgment for quantum computers. But for digital computers, or robots with digital computers as their brains, they cannot have qualia.

Let’s start with electronic logic gates. An electronic logic gate is something that has several electrical pins, some of them are designed as inputs, and some of them are designed as outputs. When the inputs change states, the output pins change as well. The simplest logic gate has

two inputs pins and one output pins. If you hook this simple logic gate to a DC power supply (one positive electrode and one negative electrode) to powered it up, so to speak, and if you connect the two input pins to either the positive electrode or the negative electrode, the third pin, i.e., the output pin will be either positive (like the positive electrode), or negative (like the negative electrode), depending on the type of logic gate it is. Let's say the positive electrode's voltage represents "true", and the negative electrode's represents "false", and if this is an OR gate, then if either one of the two input pins gets a "true" (positive voltage), the output pin will output a "true"(positive voltage). If this is an AND gate, then only if both input pins are getting "true", will the output pin output a "true". Any one input pin getting a "false" (negative voltage) will cause the output pin to output a negative voltage. You can build these types of simple logic gates from simple transistors. With simple logic gates, you can build up more complicated ones, which may have multiple input pins and multiple output pins. Even though it is an oversimplification to say that a digital computer's CPU is just a group of logic gates, but conceptually it is. So, similar to a simple logic gate, the CPU of a computer has a lot of input pins and a lot of output pins, which are to be set at either positive voltage or negative voltage following a series of inputs positives or negatives. As the computer system clock keeps sending a series of triggering pulses, each pulse causes the

CPU to be affected by its input pins voltage levels (in between the triggers, even the input pins change states, the output pins won't be affected) and changes its output pins' voltages once, and a computer is running. Note that those positive and negative voltages representing "true" and "false" has no meaning unless some human wants them to mean something, and design that representation in. The designation of "true" and "false" can be reversed if one prefers. These output pin signals can represent a number in binary form. They can represent the position of the mouse pointer. Without proper interpretation as intended by the designer, these digital signals have no intrinsic meaning.

So, how can a computer running its pins high and low following a set of "instruction" be "conscious" or having feelings? This is no difference from claiming that a music box playing music according to a set of instruction (the dots on the rotating drum) has consciousness. It is the same concept. Just that one is electrical and one is mechanical.

However, it seems rather strange, but it is true that some artificial intelligent researchers actually object to this claim. Some of them view the entire universe as a giant computer, a giant information-processing computer. Human, to them, is one form of computers. So, it is natural for some people from this group to accept computers having qualia and feelings. If indeed the

physical universe is an information processor, my question is: why is it processing information? Information of what? Information is useless unless it is interpreted and used by someone. The information contained in a book is useless unless it is read by a reader who understands that language. Otherwise the book is just a stack of paper. Why would a universe “want” to process information on its own? Processing information of what? About what? For what?

Some people believe that a “conscious” being can be created out of a digital computer running complex algorithm. The key word here is perhaps “complexity”. It is probably complexity that leads one to confuse similarity in appearance with the real thing.

## **The Chinese Room argument**

John Searle, a philosopher at U.C. Berkeley, came up with the Chinese Room Argument to demonstrate how impossible it is for an algorithm driven digital computer to truly understand the meaning of words. Modern digital computers that run on algorithms are Turing machines. From the system bios to the operating system software, to the applications installed on the computer, these are no more than sets of instructions to instruct the CPU which pin to go high and which pin to go low, in a continuous fashion, as the computer clock triggers in. Together with the onboard memory, the CPU continuously changes the

binary logical states of the memory and the output pins. The meaning of the states of the memory and the output pins is designed to be interpreted and understood in a specific way, so that the interface between one component of the computer system will match the interface of another component. If the interfaces don't match, the system will not work properly. The "1"s and "0"s are inherently meaningless unless they are properly interpreted. Just like the ink pattern on a piece of paper, it is just ink on paper. Unless the ink pattern can be interpreted by someone, it does not have informational content. When correctly interpreted, these "1" and "0" in a computer can become an image of a walking man on the screen, or it can be the result of a numerical integration, or the move of a chess game. It has to be part of the design. If wrongly interpreted, these 1's and 0's make no sense. They are just noise.

Through sophisticated programming, a computer can be programmed to engage in a dialog with a human being. An algorithm driven computer engages in a dialog through following a specific set of rules, and drawing its choice of matching words for output from a database. If you want to get a sense of how sophisticated the rules have become, go onto the Web and try to talk to some chatbots like Jabberwacky (you can google them to find them). At this point and the state of technology, you get a feeling of talking to a quite shallow person. Input gets

responded to, but the response is never quite deep. But since you started off knowing it is a chatbot, you kind of come away with some amusement. Can these chatbots fool a human into believing that it is a human, passing the so-called Turing test? In 1950's, Alan Turing, a mathematician and first generation computer scientist, proposed a test in which a conversational computer engaged a human in natural conversation by written text exchange (like texting). If the human, just by conversation alone, fails to differentiate this computer from another human engaging in similar conversation, the computer is said to have passed the Turing test. To some, this seems a tall order because sometimes only a human with the necessary cultural background can understand a sentence. Like, where will Paris Hilton stay in France? How about a film director telling an airline captain that he is going to LA to shoot a pilot? You have to understand that Paris Hilton is a person and she is not the Hilton hotel in Paris in France. You also have to understand that when the film director said he was going to shoot a pilot, he was talking about producing a pilot TV program of some sort in LA, and not trying to hurt a person who was a pilot. It seems like a human can always post questions that really poke deep into the human nature of his or her conversation partner. Somehow some subtlety will reveal when something is less than human. So, to pass the Turing test seems a tall order for a digital computer if we have a good human tester. But on the other hand, some

real human may actually fail the Turing test. I know of an engineer who is so fond of repetitive activities that he in some sense resembles a robot. He is also very intimidated by new ways of doing things that he always refuses to try newer methods. If he has an old method of getting from one room to another by blasting a hole in the middle of the wall, he will keep using this “proven” method. You can point out to him that there is actually a door that allows him to go to the other room easily without blasting a hole, he will still blast a hole and gets to the other side the old way. Imagine having this engineer sitting on one side of the wall in front of a computer terminal trying to pass the Turing test. If this still does not convince you that human can fail the Turing test, we can always bring in Rain Man (the autistic character played by Dustin Hoffman in the movie “Rain Man”) to try to pass the Turing test and see what happens. I think some of us, behaviorally are just too computer-like that the line between human and computer is just pretty blur, so the Turing test, to me, is not very meaningful in terms of recognizing consciousness at all.

The method Searle used to demonstrate the point that a rule-based computer, as sophisticated as it can be, does not have real understanding of the “conversation”, is to use a human to play the role of the computer, and see if the human at the end understands what he or she is doing. To simulate what a computer does, Searle imagines



setting up a “Chinese Room” and put a non-Chinese speaking human in there to respond to conversation written in Chinese, with Chinese. This non-Chinese speaking person is going to follow some algorithm, just like a computer would, to parse and mix and match the Chinese characters he received with a set of characters recorded in some gigantic look up tables (there are about 3000 commonly used Chinese characters).

The Chinese room has four walls and one window. The window is where the Chinese text is passed in and out. Once some Chinese characters are identified from the look-up table based on the rules, the non-Chinese speaker is going to follow another set of rules to pick another set of Chinese characters from another table for output.

This way of responding to Chinese input is pretty much what an algorithm driven digital computer does. Now, to Searle, this amounts to symbol manipulation without real understanding. Indeed, from the standpoint of the non-Chinese speaking person inside the “Chinese Room”, there is no understanding of the incoming Chinese characters whatsoever; neither does he know what he is outputting. The output coming out of the window can mimic meaningful response if the rules and look-up tables are sufficiently sophisticated, as demonstrated in those chatbot programs. But the person inside is still just blindly following rules.

A true understanding of the input will be achieved if the person in the room actually translates the Chinese characters into English, which he or she presumably understands, with the help of a dictionary or something of that sort, and formulates his response in English, and translates back into Chinese with the help of another dictionary and a Chinese grammar book. But this is not the case for the Chinese Room person.

As anyone who has manually filled out a United States federal tax return form should know, you can usually arrive at the tax figure by following the instruction that comes with the tax form, without truly understanding the working of the instruction. You need to understand which number to get from which form to fill in, but not the meaning behind doing so. You are usually instructed to copy some number from a form mailed to you by your employer to some box in the tax form. Then you will add some numbers from some line, subtract another number from another line, multiplying the result by some number from some other line, and divide it by another number from another line and so on and so forth. Assuming you have not made any mistake, the final number is probably correct. However, this correct answer does not suggest in anyway that you fully understand the calculation. One usually becomes very confused just after a few lines following the instruction, especially if you hold stocks or have other incomes, or if there are special tax break or tax

credit for that year from the federal government. Sometimes the tax is calculated and the part that you don't need to pay is subtracted out at the end. Sometimes the non-taxable income is subtracted out first, after that the tax is calculated. If you have not seen through the logic, it can become very confusing. One year in the 1990's I took the effort to understand the calculation, along the way came up with my own way of calculating it. Only after my own number agreed with the number from following the instruction, I was able to go back and make sense of the instructions. There are usually multiple ways to skin a cat. If your way is not the same as the instruction-sheet-way, it will appear that it makes no sense. Only after your number agrees with their number, you have confidence that the instruction must be right too, and it starts to dawn on you that it is just another way of calculating it, and then it all makes sense. So, one can arrive at some sensible result without actually understanding the result. A conversational computer definitely is like this case. It blindly follows the rule of symbol manipulation and arrives at some sensible looking response.

Some people argued that the understanding by the human in the room is not the right criterion on judging whether the "system" understands the Chinese text or not, because the human is only part of the system. The human not understanding the Chinese text does not mean the

“system” does not understand it. The “system” includes the room, the walls, the look-up tables, the algorithms and all the things that go into making the response possible. It is therefore possible that the “system” actually understands the Chinese text, as some researchers argued, but the human does not. That is a rather interesting argument. The human in the room is the only intelligent being in the whole system. If the human does not understand Chinese, how can the system as a whole understand? To that, Searle responded that he could make the person in the room memorize all the rules (not practical, but nothing conceptually wrong with that) and the look-up tables, and took down the walls of the room, and just let the person sit right in the middle of an open field, thus reducing the “system” to just the person. Now, the person not understanding the Chinese text should be equated to the “system” not understanding it because there is nothing left.

Despite this demonstration, the debate raged on. I believe Searle’s Chinese Room argument is correct. A computer is no more than a machine with a mechanical way of following a set of instructions. Even though it may mimic consciousness, it is unconscious. It is unconscious in the sense that it has no qualia associated with understanding.

One interesting thing I may add here is that if one really manages to memorize all the rules of symbol manipulation and the look-up tables, at some point, it may

just dawn on you why those rules are what they are and achieves a true understanding of the Chinese language, a phenomenon related to phase transition in physics (more is not just more, at some point it gets to the next level in a discontinuous fashion), or as some may prefer, an emerging property of the result of memorizing. But this is a side point. As the case of filling out the tax return form shows, if I had not taken the time to understand the filing instructions, I would have just finished the job without really understanding it. So, even after memorizing all the rules and database, there will still be a period of time when the non-Chinese speaker in the Chinese “open field” keeping blindly manipulating the Chinese symbols to arrive at a response for each input he gets, before some ah ha moments hit him and he achieves true understanding. It takes extra effort on the part of the person to achieve true understanding, and it is the true understanding that the computer does not have. True understanding should be considered something extra.

## **One more reason computers cannot have true understanding**

True understanding implies the existence of the quale of understanding. There is a certain feel to it when you understand something. It is like ah ha, oh yes, that's right, bingo!, etc... In the beginning of the book, we use the Star Trek transporter and the atom replacement machine to arrive at a contradiction: If the transporter makes two copies of you after the transportation, the one with your original body material is you, from your first person point of view. But if we use the atom replacement machine to replace your body material, then use the replaced old material to construct your clone, then the one with a new body, not the one with the old body material, is you. Two essentially identical procedures starting with the same initial condition and ending with the same final condition result in exactly two opposite conclusions. From this we inferred that the Lego block mechanical structure model of our human body must be incorrect and that the body must work in the quantum mechanical regime, so that the transporter cannot reconstruct two copies of the same person. The atom replacement machine will not work either because it will destroy the quantum coherency in the brain. We therefore cannot replicate a human, and we resolved the problem.

But a digital computer is exactly a machine with Lego block-like mechanical structure!

A computer is exactly a structure of Lego blocks of which the components can be replaced piecewise at will. A computer can be exactly duplicated at will. Its body part can be replaced one by one at will. Its internal state can be specified and copied at will. Imagine you are a conscious computer, what is going to happen to your stream of consciousness, your qualia, when your body components are swapped out one by one and replaced in a continuous fashion? And then the old body part is used to construct a new machine? It will be really hard to imagine what it will be like being that computer. If you are that computer, out of a sudden, your consciousness seems unable to find the correct hardware to anchor to. So, an algorithm driven digital computer cannot be conscious. At best, it is an automaton.

Even though I have put forward arguments to show that digital computers cannot truly understand meaning, and they cannot have consciousness (or having qualia), to really “prove” that they don’t have consciousness is harder than one may think. Some people just have this ability to imagine being a computer and being split into two. Some people can even imagine being uploaded onto the Internet and live there. With no eyes, no ear, no feelings of touch, no contact with the physical world, just pure logical algorithmic existence on the Internet. It is

not clear to me what kind of psychology this type of beings will have. It is also not clear to me why it is fun to “live” on the Internet as “1” and “0”. If you belong to this group of people, my logical argument and the Chinese Room argument can sound hollow to you. To this group of people, I ask, why don’t you take a thousand-year nap on the Internet? What is the purpose of waking up? How long is one year on the Internet? On what computer clock speed?

So far, I have not made any claim regarding quantum computers, or regarding any other to-be-invented computers. The claim I have made is only for algorithm driven, rule based digital computers.

If one defines a computer as some system that processes information, then a human brain is an example of a computer that generates consciousness and is associated with qualia (at least mine does, hope yours do too) of some feeling being. Therefore, it is possible to have other types of information processing systems that can carry these properties as well.

When I used the pins of the CPU running high and low to demonstrate how computer cannot have feelings, one can counter argue that atoms also do not do much except running around, getting closer to another atom (as in chemical reaction), or absorbing light. Yet, as lifeless as atoms are, they build up cells, which in turn build up



living conscious beings like humans. If lifeless atoms can, why can't logic gates? Good question! We just come a full circle and are back dealing with the hard problem of consciousness! How does the material brain generate qualia of some conscious being? Or does it?

**Section V**

**The Grand Unification**

## Something from nothing

God:

*I am going to bring you into existence.*

The non-existing soul:

*You can't. I don't exist.*

God:

*But I am omnipotent. My word becomes reality.*

The non-existing soul:

*You can bring someone into reality, but that won't be me.*

God:

*Why not?*

The non-existing soul:

*This someone you will bring into existence may look exactly like what you think I would look like if I exist, but I don't exist. This someone surely will not be me because there is no me. I am emptiness. I am void. I am nothing. Whatever you will create will not be empty, will not be void, will not be nothing. So that will not be me. You cannot even lay your hands on me because I simply don't exist. Who are you talking to? No body!*

*God thought for a while. Realizing that he had been talking into emptiness, he gave up. Instead, he turned around and created the universe.*

Before we were born, most people consider themselves non-existence. It is the process of birth, only the process of birth if you are materialist, or birth together with some acquisition of a soul if you are religious (some kind), that started our existence.

Let's stay with the theme that we did not exist before our birth.

It is absolutely correct to state that we have no physical existence before conception. All we have is the atoms and molecules that are to be added to our future body once conception has occurred. After that, the cell division process is pretty much continuous that it is hard to draw the line on when personhood begins. That is exactly the root cause of the pro-life and pro-choice debate in the United States. The pro-life group (anti-abortion), citing the killing of babies as a reason that abortion should be banned. On the other hand, the pro-choice group does not recognize personhood associated with an unborn embryo, thus gives more weight to the well being of the mother. Depending on how you categorize the nature of an unborn baby/embryo, you come to a very different conclusion on who should have the priority: The mother or the child.

But when does a person start to exist? When a sperm meets an egg, and form a “you”, and compare that with another sperm from the same pool meeting the same egg forming a semi-you + a semi-him/her, how did “you” get pulled into all these?

Of course, we all have forgotten how it was like to be a “sperm and egg system” before conception, and would not have memory until a full year or so after leaving the womb. One cannot help but wonder what is so special about the moment of conception. In fact, from a microscopic point of view, fertilization is still a lengthy process. It is not an instant. Using a process to define the beginning of personhood does not seem to make too much sense. It is equally problematic to define the beginning of personhood by the process of birth either. However, beside these two processes which are the obvious transition periods, what else can we use as a measure to define sensibly the beginning of personhood?

Do qualia exist for a sperm? Do qualia exist for an egg? How about for a sperm fertilized egg? Where does it all begin? When does the feeler start to feel?

On the other hand, if we did start to feel right at conception, do we remember? Can we remember? Do we have the brain capacity to “remember”? Remembering is strictly the business of the brain, not that of the mind or any immaterial process because memory is

material. Without a well functioning brain, there is no memory. Even with a functioning brain like that of an advanced stage Alzheimer patient, memory still does not work well. Then how can a fertilized egg remember anything? However, if as a full grown adult, we don't have qualia associated with our kidney filtering our blood (this process is not up at the conscious level unless something is seriously wrong!), we shouldn't expect qualia to exist for the simple existence of the fertilized eggs, which are to become ourselves.

So, when does the feeler start to feel? When do qualia start to exist for a person?

## **Becoming unconscious**

Even before we ask the question of at what point of an embryo's development that qualia start to exist, we should look at how qualia seem to appear and disappear instantaneously when an adult person goes in and out of consciousness, consciousness in medical sense.

In full anesthesia, a patient can go into a state of unresponsiveness, which is typically described as being unconscious. Majority of the people undergoing full anesthesia reported no memory of the process at all. From the third person perspective, an individual simply has gone into a state of unresponsiveness, and then comes out of it. But from the first person perspective, time

seems to have stopped and there is an experience of discontinuity in the passage of time.

Since memory is the only thing we can rely on when one does an introspective examination of one's experience, there can be no introspection for experience during the period of unresponsiveness. Therefore, qualia or not, it remains a mystery. There is a possibility that under full body anesthesia, a person continues to have qualia, and the experiences are forgotten as soon as they are formed and experienced.

How about during sleep?

It is entirely possible that one night, you go to sleep, and just almost immediately after you close your eyes, you hear the alarm clock going off and you realize it is 7 am already. You have just gone through another dreamless night! Some argue that a dreamless sleep is a myth because as soon as something triggers a memory flash, you realize you actually had dreams that you forgot about. No matter whether dreamless sleep is a myth, we know there are times when qualia indeed disappear.

In fact, from time to time, qualia disappear momentarily from a fully conscious person. The continuous stream of consciousness can be just an illusion. Julian Jaynes described vividly in Chapter 1 of his book "The origin of consciousness in the break down of the bicameral mind"

the flashlight analogy of the mind. One is not always conscious during his waking hours, Jaynes noted. In between two thoughts, for example, there may be a moment of blank (say, one tenth of a second), which is as unnoticeable to the qualia “feeler” as the blind spots in the retina are to the see-er. In trying to see where breakage occurs, the conscious mind searches through the landscape of memories, or searching the present experience as it is happening. However, wherever the mind searches, the mind finds qualia. Just like a flashlight looking for brightness, it will always find it. As soon as the flashlight starts a search, it is on, it finds light. The very action of the search changes the reality. It is therefore impossible for the flashlight to find discontinuity in the light. Only when compare to a clock can a mind notice a blank period of no qualia during sleep (or the lack of memory of it) if the period is sufficiently long. If the period is sufficiently brief, the mind will not even notice it. Thus there is this illusion of a continuous stream of consciousness on top of a truly discontinuous, and briefly broken stream of consciousness. Our qualia are not continuous. The qualia feeling agent is popping in and out of existence constantly!

Going back to our question posted in *Something from Nothing* on when the qualia feeler starts to exist when a fertilized egg develops into an embryo, and subsequently develops into an infant and a fully conscious adult, the



answer is perhaps the qualia feeler constantly pops in and out of existence for any body that is equipped to carry the qualia feeling agent.

A certain threshold of brain structure and process is required for qualia to exist. Awakening from a general anesthesia, a certain threshold needs to be established before qualia pop into existence. It is a discontinuous transition. Once the transition has occurred, the qualia feeling agent pops in and out of existence constantly, without the feeling agent itself noticing the change. For a brain of which the physical structure and process is not enough to support qualia, the feeling agent simply cannot get involved.

If something can pop in and out of existence, can it be real? Can it be physical? What does it say about my very nature if I, the conscious being, can pop in and out of existence constantly? Is real means physical? Why do I always pop back into the same body? At this point, my materialist friends may start to grumble, even though I started with materialism: This guy is a dualist in disguise! I am not sure, but why not wait until the end before making comments?

This last question is an interesting one because if you pop into existence in a different body, will you remember ever being inside a different body before? Once you pop into a different body, your access to the memory of the original

body is cut off. But you will have the memory of this new body, and you will just assume you have been in the same body all along, because you remember. So, the answer to this question seems to be, even if you pop into a different body, you cannot tell.

But really the most important question is: What dragged me into this world to experience the world this way through this mass of gray matter that people refer to as my brain?

## **Why am I me? Can I be you?**

Many people have this experience of feeling being lucky to be born the way they are, as if there were any other possible ways. Warren Buffett called this “the lottery of the womb”. He made this comment in the context of seeing the boat haulers in one poor rural part in China along the Yangtze river when he was traveling (see “Snow Ball” by Alice Schroeder). He noted that by just being born to this region, these young people were much more likely to become the boat haulers that they had eventually become. Compare with someone who was born in an affluent suburban America, these young boat haulers might not have had the chance to succeed in other areas. Who you are depends on which womb you come from. If you materialize in the “right” womb, you are already way ahead in life. Implicit in many people’s thinking is one can potentially come from a different womb.

On a radio talk show aired some time ago, a female listener called in to make comments on the topic of world hunger, and her very first sentence was, “I am feeling so fortunate that I was born who I was....” “You mean born as a white female in America...” the host interjected. “Yes...” and the listener continued to express her sympathy toward people who were suffering from malnutrition due to hunger in other parts of the world.

She sounded like there was a real possibility that she could have been one of them.

But are these types of emotion unfounded? After all, you are who you are, after the fact. People may have nightmare about falling off a cliff after a brush with death by almost falling off a cliff, but who would have nightmare over the possibility that his or her parents never got a chance to meet? (Whew...I almost did not get born..) It is after the fact!

But then, under some circumstances, one would still wonder, why am I born me? Why am I born to this identity? Could I have been born someone else?

Is this type of personality swap thought experiment valid? Is the question of why I was born into this body a valid question?

As a materialist I can immediately resort to the human brain structure, such as the possible mirror neurons structure, or other mechanism that enable human empathy to answer this question. In fact, this is the right answer. But it is not the answer to the question itself. It only answered why human will often ask this kind of question, and says nothing about the validity of the question itself.

Indeed, being a kind of social animals, humans have the brain structure for the capability to project one's own situation into his/her fellow human, and take a reading

from those other individual's point of view. In order to function as a group, when decision can be a make-or-break depending on the buy-in of other members of the group, this capability of asking *what if I were somebody else* is of unique importance. However, this only show that the society structure a human is in requires the capability to shift one's perspective, which may bring about the capability to ask the question of "why am I me" as a by-product, but it does not prove or disprove the validity of the philosophical implication of asking this question itself. Whether this question is philosophically meaningful or not need to be addressed separately.

We have a philosophical tendency to believe that all minds are created equal. Let's exclude other animals from our consideration for now. Philosophically, we view every human mind as an equal creation. However, in practice, we all know some minds are more equal than others.

Some people are born retarded. Some are born suicidal. Some are born thinking-type genius. Some are destined to be rich because they are business enthusiasts. Some are born with slight deviation that can easily result in becoming a sexual predator. Some are born pessimists. Some are born more entrepreneurial. Some are born with a talent in writing. Some are born with great charisma. Some are born workaholic. All in all, every one is born different. Now, how does that stack up against the belief

that every person is born equal? No doubt, there are those who are living happier lives, and there are those who are living much more miserable ones. When every individual has such a different starting point and equipment, how could all minds be equal? Equal in what?

People in general like equality. Equality is sometimes equated to fairness. Equality is a nice concept because it is also a sign of harmony and simplicity. In physics, it is usually a state of lowest energy. Think of a pond on a calm day. The water level on the pond is equal everywhere. Unless there is a reason for the water level to be different somewhere, the water surface should be smooth and flat. This is the most symmetrical distribution. Unless there is something to break the symmetry, symmetry is the tendency of nature. However, with slight wind, ripples start to form and propagate. Inequality requires a cause, or causes, such as the wind. Equality does not. Dividing a cake among several children, we all expect equal partition of the cake, for the lack of any reasons. However, if one child deserves more, there has to be a specific reason compelling enough to justify the extra size. Without that, equality rules. Sometime, situation dictates that the symmetry or equality be broken. For example, if the prize is not a cake for the children, but a beautiful watch, which is not divisible. Only one child will get the prize and everyone else gets nothing. In this case, a fair lucky draw is performed. The

equality comes from the equal chance each child has in the lucky-draw lottery. Every child has equal chance before an event is concluded. In physics, this phenomenon is called “spontaneous symmetry breaking”: When the equation is symmetrical, but the solution is not. But in this case, there are multiple solutions that are equally probable. Which one is finally realized is pure chance, just like the case of a lucky draw. The equality in the case of getting a watch as the prize is that each child has a REAL EQUAL CHANCE of getting it. But does a person have real equal chance to be born someone else before he/she is finally born? What does it mean when someone say “I could have been born you”?

As newborns after newborns are received into this world, what could have “pre-ordained” them to the kind of inequality they are going to face in real life? Each new born is so innocent. Each new born is so pure, so uncontaminated. And yet, out of all these newborns of today, outgrow the worse criminals of tomorrow, among the many greatest thinkers and ordinary individuals. But they are all starting out as innocent human babies! Why are some going to have a smooth sailing, while other should be condemned to the underworld simply because they don’t have the same hardware and initial condition? People don’t start equal, and the differences amplify during the course of life.

What broke the equality that was there before our existence?

How do we know there was equality before our existence? Well, if there was nothing before our existence, isn't zero the ultimate equality that we can ever achieve? If we all did not exist before, weren't we all equal before? Zero equals zero. So what break that state of equality, and why are some getting the shorter end of the stick?

### **If I am me, I cannot be you**

There are many types of positive experience in life that, once one is a certain person, he or she will be forever cut off from the possibility of ever experiencing them. The experience of being in love will probably be rated very high on the list of positive experiences. All men will probably treasure very much the experience of being deeply in love with the woman of his life. However, this male perspective of love experience is forever taken away from you if you are a woman, and vice versa. Being a woman, you can only experience it from the female side. Admittedly, the quality of the experience of both genders is quite different but equally valuable. So, if life has purpose, and if we take some religious view that the purpose of life is to experience life itself, it is unclear why some part of the most treasured experience of human life should ever be denied to half of the human populations.



So, if I was born me, I cannot experience the world as you do. If I was born with lower brain capacity, I cannot experience the world as a high brain power person does. If I am born short, I cannot experience the world as a tall person. By taking on a specific identity after birth, one immediate gets drop into a tiny subset of all possible experiences that he or she could originally explore. If the purpose of life is really to experience life itself, aren't we missing something right off the gate? It will be very dissatisfying philosophically if an explanation cannot be offered as why we are denied some part of the life experience by just being born.

## **The paradox of non-existence**

Just think about this statement:

*If I don't exist, then there is nothing in this universe that can have any effect on me.*

This seems like a very simple true statement. Indeed, if someone does not exist, nothing can have any effect on this person because he/she does not even exist! What else can be wrong? So, I can care less about what is happening in the universe, that is, if I don't exist. Most people will think about this statement in the following sense: If I die in the next minute, whatever happens tomorrow is going to have nothing to do with me because I no longer exist. I won't feel a thing.

But what if this statement was made referring to a world before you were born? You claim, “Since it was before my time, nothing that happened affected me in any way. I wasn’t even there to feel the immediate effect of what ever happened.”

Of course, this statement remained true until your father met your mother and this historical event in the universe brought about your very existence. So, next time if someone tells you that whatever happened before his time would not affect him back then, ask him if that includes the event of his father meeting his mother, because this historical event dragged a non-existing him out of the shadow and into reality.

So, what causes the truthness of the first statement to change?

Maybe one should then change the statement into:

***“If I don’t exist, then nothing can have any effect on me, except if my father meets my mother.”***

But if you don’t exist, then why would there be someone who is going/designated to be your father or mother? They can have an offspring, who may grow up looking exactly just like the you that you turned out to be, but why would it have anything to do with YOU, the non-existing YOU at the moment?

This section is asking the same question asked in the Section “Something from nothing” where the non-existence soul told God he could not bring it into existence no matter how omnipotent God was.

Indeed, we have this same question: If I have never existed before, how could I be brought into existence? In order to bring me from the state of nonexistence to a state of existence, something has to act on me. Some action has to be performed on me. But since there was no me, the action had nothing to act on, and so it could not have caused me to change state. It did something, but did not act on me. But the fact that I now exist, doesn't it imply that I must have existed before?

## **All the puzzles**

Now we have arrived at a critical point in our journey. We have accumulated enough questions and observations. We may be in for some breakthrough.

First, we find that we exist. We affirm our existence from the existence of a set of subjective feelings we have. Since feeling cannot exist in a vacuum without a corresponding owner of those feelings, we therefore can infer our own existence as the feeler who is the owner of these subjective feelings. However, the existence of this feeler is shown to be problematic because of the following reasons:

- 1) There seems to be no particular reason that we should exist in this era rather than in any other era, here rather than there.
- 2) Even if “our” brain exists, there is no reason the brain cannot handle daily life automatically in a subconscious mode, but yet it always invoke the consciousness through generating those qualia for us to feel.
- 3) There does not seem to have any pathway connecting any physical process to feelings, i.e., how does atoms moving around generate feelings of some conscious being? (The hard problem of consciousness).

- 4) Problem of transition from non-existence to existence. If I did not exist before, and only exist after birth, how could a non-existing me be brought into existence? What could have put a hook on the non-existence me and dragged “me” into existence?
- 5) Why am I me? There does not seem to be a reason why I should be looking out to the universe through the position of the physical body that I recognized as mine. Why am I not someone else? What broke the symmetry of nothingness that existed before everyone was born? All minds should be created equal. Why aren’t we equal?

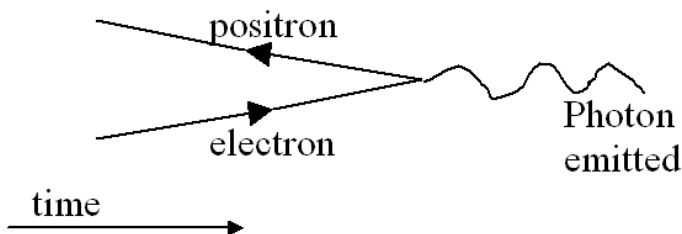
The existence of the feeler, or equivalently, the existence of the self in me, or the existence of my subjective experiences, brought out this series of questions and every one of them demands an answer.

As the Chinese Room argument put forth by John Searle shows how impossible a logic-gates-based computer can achieve a state of consciousness, it is equally impossible for an atom-based mechanical structure to achieve a state of consciousness as well. But yet, we, the atom-based humans, are able to vividly experience the richness of the qualia presented to us. Isn’t there some huge inconsistency lying somewhere in our understanding of the world? I think there is an answer to that.

## **It is all the same electron, stupid!**

In his Nobel lecture, the late great physicist Richard Feynman told of a story about when he was a graduate student at Princeton University studying under another great physicist John Wheeler. Feynman said Wheeler called him one day and told him he understood why all the electrons in the universe were identical. He said, “If you have seen one, you have seen them all.” Wheeler suggested that all the electrons in the universe were in fact the same electron! Wheeler then gave Feynman a description of what he thought was an electron zigzagging through space and time billion and billion times, making it appear to us that there were billion and billions of electrons. When an electron is traveling through space-time, at some point when it hits an anti-electron, the positron, the pair will annihilate each other and the pair turns into a photon, which then continues its journey until next collision occurs or until the photon is absorbed by something else. On the other hand, the positron that annihilated the electron, if looked at from a different perspective, is actually the electron itself.

Below shows a diagram of the annihilation process:



In the above Feynman diagram, time flows from the left to the right. The vertical direction is space coordinate. An anti-electron (positron) is represented by an arrow pointing backward in time (to the left). The regular electron is represented by the lower arrow that points to the right and slightly upward. Both the electron line and the positron line meet further to the right where they join and annihilate each other, and turn into a wavy photon line. An alert reader must have been wondering why the positron line points backward in time (to the left) while the electron points forward in time (to the right). It actually came out of the Dirac equation, the field equation for spin  $\frac{1}{2}$  fermions (the kind of particles that the electrons are, obeying the so-called Fermi statistics). The Dirac equation admits two solutions, one with positive frequency and the other with “negative” frequency. The positive frequency solution corresponds to the regular electron, and the negative frequency solution turned out to be that of the anti-electron. Without realizing what his

equation was telling him, that every Fermion had an anti-Fermion counterpart, Dirac missed a chance to make a historical prediction: The existence of a new type of particles called the anti-electrons, (also known as positron because it is positively charged). The positron was experimentally discovered four years after Dirac proposed his equation, solving the mystery of why there was this negative energy solution to the equation. Since the frequency of the solution always appear together with the time, one can absorb the negative sign into the time quantity and it will then appear that the antiparticle also have positive frequency (energy) but just that it is a regular particle traveling backward in time. So, the interpretation is, when a particle travels backward in time, it appears to a conscious observer that it is an antiparticle moving forward in time. Or put it in another way, *due to the incapability of a human observer to perceive something traveling back into the past, a regular particle traveling backward in time will appear to the human observer as an antiparticle traveling forward in time!*

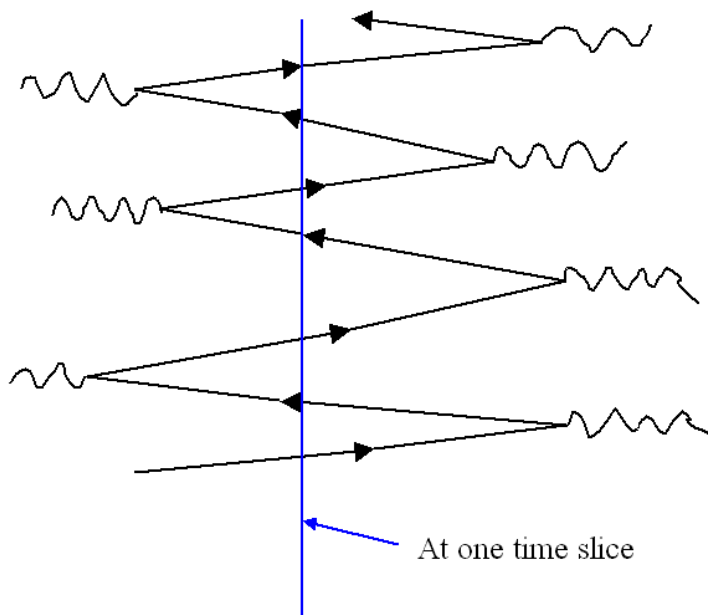
So, Feynman did not take Wheeler's conjecture that all electrons were the same electron seriously, but he accepted the positron as a temporally backward pointing electron. "That I stole," Feynman said in his Nobel lecture. He then invented his famous and intuitive "Feynman Diagram" technique in particle physics. In a



Feynman diagram, all the lines and vertex have precise mathematical meanings. For example, an incoming line is a wavefunction, a vertex is a coupling constant and some interaction dependent matrix, a line connecting two vertices is a propagator, and so on. Physicists can read off the Feynman diagram of a particle interaction/reaction and write down the exact mathematical representation of the reaction rate (cross-section, as more commonly known among physicists). It is now standard in particle physics that all antiparticles are represented by the same lines as the normal particles, except pointing backward in time. Feynman diagram is now a part of the standard particle physics, and an anti-particle as a normal particle traveling backward in time has also become a firmly established concept in modern physics.

So, what let Wheeler to suspect that there was only one electron in this whole universe and if you have seen one, you have seen them all?

Think about an electron that zigzags back and forth in time. Every time it changes its traveling direction, it emits a photon (or a photon knocks the electron into changing time traveling direction). In diagram, it will appear as the following:



Again, the horizontal axis being the time axis and the left hand side is the earlier time. Causally in the language of electron-positron interaction, we see a lot of electron-positron pairs being created by incoming photons on the left hand side. And then at different time in the future, on the right hand side, these electrons and anti-electrons recombine (perhaps switching partners) and all turn into photons again. At some point in time represented by the vertical blue line (the blue line represents one moment in time across many space points), when we make a

measurement and count the particles, we would count one particle for each right pointing arrow, and one anti-particle for each left pointing arrow that crosses the vertical blue line. So, in this picture, many photons turn into many electron-antielectron pairs and these particle pairs are counted at some moment represented by the vertical line before they all turn into photons again. However, this is only one way of describing the reality represented by this Feynman diagram.

If we start from the electron represented by the bottom arrow, and follow it going back and forth in time (zigzagging left and right), we will have a quite different, but equally valid, picture. First an electron travels forward in time. Then at some point in time in the future, it passes the point that is indicated by the vertical blue line. This is the first time this electron has passed this particular moment when we count the number of particles. When it passes this point in time for the first time in the lowest arrow, the electron appears as an electron on its way to the future. Then some time later, this electron emits a photon, and the recoil of the photon knocks the electron into traveling backward in time, into the past. So, when this electron crosses the same point in time, the blue line, when we count the particles, again, it appears as an electron on its way to the past. But for us the human observer, we see an anti-electron going forward towards the future. (Note: everything appears to

be traveling forward in time for a human observer, because we have no ability to perceive things traveling back into the past). So the human observer sees two particles from the same electron, so far. Then some time in the past, this electron runs into another photon, which it absorbed and knocked its time traveling direction back into pointing at the future again. So, when this electron crosses the same time point again in the third arrow up, it appears as another ordinary electron traveling into the future. So, from the same electron, we can now observe three particles appearing at the same time from the three passing of this same electron. Of course, this is not all. As this same electron zigzags through time, more electrons and anti-electrons appear. So, in principle, one electron can zigzag billions of times, giving rise to all the electrons one observes in the entire universe. There is no constraint on how many times it can do this. One caveat is that we will see the same number of electrons and anti-electrons in the entire universe. That was exactly what Feynman immediately said to Wheeler over the phone, “So, where are the anti-electrons?” We definitely have not observed that many anti-electrons in the wild. “Maybe they are all locked up in the atomic nuclei”, Wheeler conjectured, he did not know either, but nuclei are where the positive charges are. At present, this is still a hot research topic in physics as whether there is an imbalance between matter and antimatter, or they are equal in quantity, but just being separated by the vastness

of space after creation. In other words, antimatters may not have revealed themselves to us the earthlings at this corner of the universe by coming into contact with regular matters and annihilating them in the process.

If all the electrons in the universe we can account for really is the same electron (a real possibility which contradicts nothing so far), all the electrons in our body is the same electron interacting with itself. The same goes for the protons and neutrons. We come to a picture of one single electron, one single proton and one single neutron zigzagging back and forth in time giving rise to all our entire physical world. The entire universe is one single atom! And this single atom gives rise to our consciousness, materialistically speaking. So much for those who think the universe is a giant computer processing information. One atom is processing information of ...of one atom itself!

If we are to take serious the idea that all the electrons in the universe could have actually been the same electron, then we have a suddenly realization as well: Can't all the consciousness be actually the same consciousness? Can we all be the same conscious being? Can we all be the same person?

I don't want to give a misrepresentation that the Feynman diagram of one single electron zigzagging through time has any logical connection whatsoever with the conjecture

that all human experiences belong to the experience of the same person, the same qualia owner, the same conscious being, other than that it is a mere analogy metaphorically. I presented it this way simply because it dawned on me this way when I was in graduate school studying towards my Ph.D. However, once we made this analogy, the concept that human qualia have one single owner suddenly becomes very appealing, and it takes on a life of its own. I will call this the universal mind hypothesis.

## **Another look at the self, with time shifting**

Time traveling is impossible. This is a simple deduction based on causality. However, it does not forbid one from thinking about it. Maybe we can gain some insight from such a mental exercise. Many science fictions have already had time traveling in their plots: The crew of the Starship Enterprise, riding on a Klingon ship, went back to the 20<sup>th</sup> century earth to bring back a humpback whale in the movie “Star Trek IV”; Harry Potter and Hermione Granger went back in time to save the earlier Harry surrounded by Demons in “Harry Potter and the Prisoner of Azkaban”; Henry DeTamble, the husband in “The Time Traveler’s Wife”, kept involuntarily dissolving himself, and rematerialized in another time, sometime coming face to face with his younger self; Marty McFly almost endangered his own existence by going back 30

years and tempered with his parents' love history in the movie "Back to the Future"; and of course, there is always the famous H.G.Wells and his time traveling machine. But in most, if not all, of these science fiction stories, the first person perspective of the event was simply glossed over. That is the aspect that is worth exploring here.

Suppose you travel back in time and arrive at your house ten years before you start. Walking into the front door, you see the old staircase before the remodeling five years ago (your future time frame). As you walking further in, you find yourself sitting in a rocking chair reading a magazine that is already defunct (note: "you find yourself" should be interpreted as "you find your earlier self"). Looking at yourself ten years younger, and he looks up and sees you, how will you feel? Will you be surprised seeing yourself appearing in the living room 10 years older? Older? No, you mean younger because you are the older one. But wait, you ARE the younger one as well... So what is going on? When you see the future you, or, when you see the former you, which you are you? Which you are YOU in? This simple question sometimes does not sink in fast enough for some that there is a real problem because the most common response is: Of course I am the older one. By describing the sequence of event from the viewpoint of the one who goes back in time to see the former self convinces a lot of

people to take the point of view of the future self, and treat the younger self as “someone” else. However, let’s describe the event differently. It is Sunday afternoon, you have just finished doing some yard work and are relaxing in the living room. You pick up a magazine randomly and start reading. Out of a sudden, there is a guy comes through the door, passing the staircase, and stops right in front of you. You look up and he is starring right at you. His first words are, “I am you, I am from the future.” Now tell me, which you are you in? Would any one still claim that if there are the older self and the younger self exist at the same time, you are automatically the older one? In fact, it is exactly the same consciousness behind both selves. But then, which self are you in? Which self are YOU in?

Could there be two YOUs? Is it possible that there are two instances of YOU, two instances of a single being from a single self?

Obviously strange things happen if you are able to temper with the flow of time. It will be even stranger if you are able to loop back the time line and let it cross itself, as in this case. A future you come back to meet with the current you, or shifting position, you go back in time to see the past you. This case is more bizarre than the cloning of self from the Star Trek transporter because there is no doubt that in this case, both are authentic YOU. There is no clone. It does illustrate the concept of



having two instances of a single consciousness. Each one of you will think that he/she is the current you, without knowing that both instances are the same person in nature.

## **The incompleteness of materialism**

When I laid down a case for materialism at the very beginning of this book, I showed that many phenomena once thought to be in the mental domain are actually explainable inside materialism. The advance in neuroscience gradually chips away the mystery surrounding many of the mental phenomena. My argument remains valid. However, these phenomena once thought of as mental were just being mistaken to be mental. Memory, which was thought of as mental, is physical because even computer can recall its memory. Thinking is physical because even a computer can “think” and arrives at an answer, such as a chess move. But the qualia associated with the thinking process, the qualia associated with the remembering process, are the truly mental quality. As the brain is for thinking, the mind is for feeling. Therefore, it is in trying to explain the existence of qualia, materialism suffers its most severe crisis. First of all, the hard problem of self-consciousness as formulated by David Chalmers reveals a vast unbridgeable gap between what the philosophy of materialism can offer and what needs to be explained. It can be shown that the fundamental problem is the existence of qualia when the question is applied to oneself

in a first person way. Many people attempted to explain the wrong problem: The existence of someone else's qualia. No, that is not the problem. Someone else's qualia problem is not a problem at all. Someone else's qualia are our own theoretical model in trying to understand other people's behavior. And other people's behavior is completely explainable in terms of neuroscience and materialism. They are the solutions to those so-called "easy" problems.

Only when qualia exist in a first person perspective for us, it stops being a model and turns into something real in the most direct way. When one takes on the role of the first person experiencer, qualia become inexplicable. The weight of the problem suddenly becomes overwhelming. Why am I here? What am I doing here on this 21<sup>st</sup> century earth? Who put me here? Why am I me? Could I have been born somebody else? Etc, etc..

When one faces these types of questions related to one's very own existence, materialism, which has been so almightily powerful in explaining our "external" objective material world, suddenly seems so vulnerable.

Those who cling on to the philosophy of pure materialism face the danger of misidentifying the material of the body as the nature of themselves (the body could have come from just one single electron plus one single proton and one single neutron, as every other body, besides, it could

be a virtual body that you are identifying with, see the Matrix section). In pure materialism, one's identity can only come either from the material forming the body, or the pattern the atoms are arranged inside the body, i.e., material identity versus pattern identity. There is nothing else for personal identity to be identified with. However, neither the material of the body nor the pattern of the body structure provides a satisfactory association to one's identity. Even though we have shown before in the Star Trek transporter thought experiment that pattern is what should define our personal identity, not the body material, our body pattern keeps changing, and yet we keep the same identity life long. So, even pattern identity is not a satisfactory answer.

Pure monistic materialism cannot be a complete philosophical solution. We need an extension of materialism.

At this point, let us distinguish what are the functions of the brain, and what are not the functions of the brain. The brain is charged with making decisions, responsible for all kinds of thinking processes, forming memories, receiving and analyzing vital body signals, and automatically maintaining the vital functions of the body. However, it is not the brain's function to give you the feeling or to give you the experience of qualia. There is simply no pathway for it to do that. Yes, every feeling we have has a corresponding brain process. Yes, all qualia are

associated with some physical processes in some brain. So, in some way, the brain “knows” about qualia because the information is flowing in it. However, with the brain alone, the brain will just process those signals, makes decisions, execute decisions, and you don’t have to feel it. The body will be like an automaton getting on with its life. But the fact that you are aware of “your” brain’s decision in the form of qualia means there is something that is tapping into your brain to connect you to those signals. Without this connection, your brain will just be some brain, or somebody else’s brain. This something that taps into your brain and connect you with your brain signal is the true nature of your identity.

## **I am just like the CPU!**

Taking a hint from time traveler who travels to the past and stands/stood face to face with his former self, we realize that one conscious being can have multiple instances. Due to the physical isolation of each instances, the conscious being may not recognize himself of a different instances. When the former self sees the future self, he would not know what the future self is thinking, and vice versa. But clearly these two individual are two instances of the same conscious being, just time shifted. Also taking the analogy from John Wheeler’s conjecture that one elementary particle can give rise to all the materials we see in the material world by traveling back and forth in time, creating multiple instances of itself and

its antiparticles and becoming the whole universe, we conjecture that if there is one single universal mind, this single universal mind could account for all the conscious beings in this universe as well. If we, the many different conscious individuals, are actually one and the same conscious being, the universal mind, then we have at least the advantage of solving many questions we asked before, rephrased and simplified as follows:

Why am I me?

- 1) Why aren't we living in subconscious mode?
- 2) The existence of qualia (the hard problem or consciousness)
- 3) The problem of other minds
- 4) What dragged me into existence, from a state of non-existence?
- 5) What caused me to exist on the 21<sup>st</sup> century earth, and not any other time?
- 6) Does philosophical zombie exist?

If every conscious being in this universe is the same conscious being, then the question of why I am me lost it's meaning. I am every body. Just that when I am feeling through my current body, I am me, the current body. But in the other instance, when I am feeling the world through another body, I take on the identity of a different person and the memory of this different person now defines my identity. In the example of future me

meeting the current me, I am both. Both future me and present me are ME. But when I am looking through the body of the “present me”, I am not aware of my consciousness looking through the body of the “future me”. When I look through the body of the “future me” who travels back in time to meet with the “present me”, I cannot feel the present moment of the “present me”, but only from the ten years old memory that I remember seeing myself from the future, assuming I have not lost those memory due to a travel accident in the ten years.

If you don't see how a universal mind works, there is a good analogy between the philosophy of a universal mind and a modern computer system, with the universal mind being the CPU of a computer universe.

A modern computer with a modern multitasking operating system runs in the following way: The computing power of the CPU is distributed among all the running programs in a time-sharing way. In a pre-emptive multitasking environment, each program is allocated a certain number of CPU clock steps each time, and they are then run sequentially. A program will run for some number of CPU steps, then be put on-hold, with all its current states shelved onto a stack, its memory space locked up, and another program will be retrieved, and run for a number of CPU steps off this second program's memory space. Then this second program will be put on the shelf, and the third program will be run, and so on and so forth. None

of the programs will be run to their completion in one shot. All the programs will be run just a few steps at a time. And since the CPU cycles through all the programs multiple times in a second, it creates the appearance that all the programs are running concurrently. Indeed, barring a system crash or program crash, all the programs are equally responsive in a human responsiveness time scale.

So, if I, the Universal Mind, am like the CPU, I will be playing the role of each program. When it is time to execute one particular program, I, the CPU, will take on the identity of that program. I will have access to the memory space of that program. I will remember the world from the point of view of that program. If I am running MS Excel, I will inherit all the memory space and content allocated to Excel. I, the CPU, will temporarily assume the identity of Excel. I am Excel. Excel is me. When the time slot allocated to Excel is up, it will be put on hold, and another program, this time perhaps an antivirus program, will now come to life to do its job. I, the CPU, will become the antivirus program. I am the antivirus program. I will not remember being Excel before because I am not accessing Excel's memory space any more. All I remember is I have been the antivirus program all along. I will perform all the tasks the antivirus program is supposed to do, as specified in the software.

Even though there are many programs being run, seemingly simultaneously, there is only one CPU doing the running, and that is ME. The CPU runs all the programs “simultaneously”. Me, the Universal Mind, simultaneously feel from the point of view of each conscious being.

The situation can be demonstrated even more vividly by a CPU running the SIMS family game program created by Will Wright. Again, there is one CPU running the entire program. However, there are multiple characters in the program. When a character comes to life, the CPU runs that character’s subroutine, as if the CPU is that character, and that character alone. Each character’s subroutine takes turn being played out by the CPU. From the outside of it, all the characters are alive and simultaneously interacting with each other. They may be dating. They may be having lunch. They may be engaging in different activities with each other, just like a human society would. But at the end, it is all the role-playing done by the CPU.

Now, I am suggesting that to understand the problem of qualia, we may have a similar situation. Each one of us is a different role played by the universal mind. Without realizing the role-playing nature of our identity, each one of us is wondering where our feelings come from. Each one of us is asking why I am me. Each one of us sees that not all minds are created equal, given the difference in

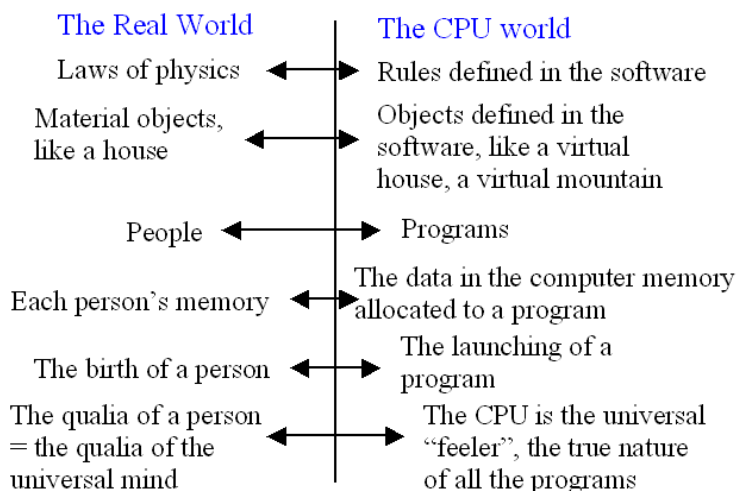


brain power given to each one by his or her genetics. Just like the characters in the SIMS Family are complaining (if they are programmed to) about their lives inside their world, we are wondering why our lives are like these in our physical world. Why some are so unfairly put into the disadvantageous position, while others are having a good time in life. Unknown to the Sims, their characters are all illusions. They are all played by the same CPU. It is the CPU, if anything, that experiences all the “qualia” when it is playing out each role during their time slice in a multitasking environment. But the CPU does not know it when it is in a role! Ultimately, it is the CPU who, forgetting all the other characters that it has ever played because of the lack of memories of them when it takes on the role of one character’s subroutine, thus only having access to the memories of that subroutine, is complaining about the inequality of life of its own character. But life is fair for the CPU because it is everyone. It plays everyone. Realizing that it is the same CPU who all the “suffering” and “joys” belong to, the question of inequality disappears for the SIMS. It is the same entity that is experiencing the world through different viewpoints, through playing different roles. It has been the same one all along.

Similarly, in our world, if we are all just different viewpoints of the same conscious being, then the nature of qualia becomes easily understandable. Everything is

really fair. Quale is simply one irreducible characteristics of nature itself because nature has a universal mind. The existence of qualia is simply a reflection of the existence of this universal feeler who is nature itself. Very possibly, qualia, just like mass or electric charge, is a fundamental property of nature itself. If this is indeed the case, then it follows that qualia cannot be derived from other more fundamental elements in the material universe, like mass cannot be explained in term of electric charge. The philosophy of materialism, which basically is like the philosophy of the software component in our CPU world, misses the entire qualia component of the universe, and hopelessly trying to explain the existence of qualia in terms of material, hopelessly trying to see if qualia can emerge from physical law, similar to a computer programmer who tries hopelessly to explain the existence of the CPU in terms of the software programs it is running, trying to see if the laws in the software can cause the existence of the CPU. It cannot be done.

So, we have the following analogy between our physical world and the CPU world:



Just like in our real world, where the laws of nature need to be satisfied, in the CPU world, the laws of software that defines the virtual environment need to be satisfied. In our real world, the material brain determines the intelligence of an individual. In the CPU world, the sophistication of a piece of software determines how smart the program is. In our world, the Universal Mind cannot affect the outcome of a physical system (no mind over matter) other than to experience it. The brain thinks and decides, and the mind experiences. In the CPU world, the CPU cannot affect the result of the software operation other than to faithfully carry out the instructions written into the software programming itself.

What I have proposed here is no longer the philosophy of materialism, even though I started with it. In a monistic materialist's language, what I have proposed is dualism. There is a material component, and then there is a mental component, but it is fundamentally different from the Cartesian dualism because you no longer having a mind appearing like a halo around a brain. The mind and the physical simply belong to different domain, but they interact, just like the CPU and the software belong to different domain of the computer, but they interact as well. We now have this explicitly interacting dualism that is epiphenomenal.

In this analogy, our material world is mapped to the software part of the CPU world, while the mental part, the qualia related part, is mapped to the hardware part of the CPU world, i.e., the CPU itself. It is interesting to notice that people have this natural tendency to associate the physical thing with hardware, and the mental thing with software. In our analogy, it is exactly the opposite. All qualia, the mental part of our real world are all mapped to the CPU, while all the material part of our real world are mapped to the software which dictates the virtual environment of the CPU world.

Remember one strong objection to dualism is that if the mind is immaterial, then it is impossible for it to interact with the material brain because by having an effect in the material brain, the mind change the course of this physical

world, and so sooner or later, we will discover some violation to the laws of physics just from the effect of the mind. The brain, being a physical system itself, has to obey the law of physics (it cannot violate conservation of energy, for example), and therefore, it cannot be affected by the mind.

Now, in view of the CPU analogy, what would you say about the immateriality of the mind, the Universal Mind? The CPU is constantly interacting with the software. In fact, the CPU is required to run the software. But despite the hardware-software interaction in our CPU analogy, the CPU is powerless to change the outcome set forth in the software. Even though the CPU is constantly running the program, it is basically a bystander watching those programs run. Sometimes we do feel like we are just bystanders watching our world run. Even our body seems to be able to deal with the world automatically and renders us to the bystander status. We all have moments when we say something interesting, and wonder afterward why we would say such a thing. In view of the CPU/software interaction analogy, even though the mind is constantly interacting with the brain, the mind is powerless in influencing any of the brain processes. What the mind can do is to feel, carry out the brain processes, perhaps by moving the “now” moment forward!

## **The Universal Mind**

The possibility of a universal mind cannot be lightly dismissed. It is such a beautiful concept and it solved so many conceptual problems in the philosophy of mind. If there is a Universal Mind, then mindfulness is one irreducible characteristics of the universe, just like mass and length or electrical charge. The philosophy of materialism has been trying to derive the mind from other fundamental properties of the material world. It has either succeeded in proving otherwise like David Chalmers has discovered, or it has succeeded in denying the existence of qualia all together, like Daniel Dennett of Tufts University. The advance in neuroscience has only succeeded in discovering more and more properties of the brain, solving many of the so-called “easy problems”, a term coined by David Chalmers to describe those difficult problems of identifying which part of the brain does what to affect an individual’s behavior. The hard problem remains untouchable because there does not seem to have place where you can begin to touch it first.

For me, the denial of qualia is definitely not a satisfying outcome in the pursuit of the nature of the mind. Qualia should be self-evident because it is the quality of one’s own feeling, which is directly accessible by any individual. This direct access is even more direct than reading out the numbers on a digital meter because even that, the read out still get into you in the form of qualia.

In other words, no data are as direct as the qualia data. If we admit the existence of qualia, the only choice we have is to confront the problem head-on, and to realize that pure materialism has missed a big chunk of content that is there to be reconciled with. In a universe where I am not part of, where I don't find myself taking a particular point of view looking outward, pure materialism will be 100% correct. But my very own existence within this universe changed everything, because now I have a viewpoint from the first person perspective. My existence needs to be explained. My very own existence becomes a problem. A transition from a state of non-existence before conception to a state of existence is particularly problematic because it is a case of "something from nothing". It is a case where a non-existence self can be dragged into existence, while by definition, something that does not exist cannot be dragged on, acted upon, or changed upon. The timing of existence is another problem. The association of oneself with the 21<sup>st</sup> century earth is particularly unreasonable, given the long history of the universe. And finally, even given one's existence, on the 21<sup>st</sup> century earth, there are still countless conscious bodies one can find himself or herself in, the question of why I am me instead of someone else again post the final challenge to the philosophy of mind.

However, once the possibility that all conscious beings in the universe could really be just the same consciousness,

the confusions are suddenly transcended. Taking a clue from John Wheeler's conjecture that one electron could have accounted for all the electrons in the entire universe, the existence of the Universal Mind becomes all more attractive.

The hardware/software interaction model of modern digital computer provides a way to think about the interaction between this Universal Mind and all the brains of the universe. If we take one step further, we may even be able to claim that the material universe does not work without the mind just like a computer system does not work without the CPU. You can have all the intelligent bodies floating around, but it amount to an atemporal layout, just like you can have all the beautiful software installed, without the CPU running, these are just atemporal layout in the hard drive. Computer time loses its meaning without the CPU running. Similarly, time loses its meaning without the mind because the perception of time is one type of qualia of the mind. I suspect it is the Universal Mind that determines which NOW is the current NOW.

In the study of the philosophy of time, one always comes to the conclusion that time simply does not flow. If we draw a line on a piece of paper as the time line, and if we put a dot on this time line for each historical event, from the first construction of the first pyramid, or the completion of China's great wall, to the birth of Newton,



to the end of World War II, we find that time is simply a label defining the relationship between events. This line comes from infinitely early, or the big-bang if it did occur, and extends infinitely far into the future. It is a static line. It is atemporal. Conceptually, from a pure materialist point of view, the universe evolves according to a set of rules, which we called the laws of physics. Whether this set of rules has been completely discovered by human or not, as long as such a set of rules exist, the universe evolves deterministically (even taken into consideration the quantum mechanical nature of the world, the gigantic wavefunction of the world still evolves deterministically according to the “Hamiltonian” in a relativistic form of the Schroedinger equation, and so all past and future events are already determined, and therefore the entire time line is already determined, and therefore it is static. So, time does not flow. It is like a movie already recorded on a DVD, which is atemporal. Along this line of thinking, we will then ask who plays this DVD and who determines which frame into this infinitely long movie is “now” being played on the screen? Why is NOW now?

The sense of time flowing by, and the sense that there is a now that is constantly moving relative to those historical events is a mystery.

Even though time is an important concept in physics, in a way, time is not physical. Time is purely mental. The

laws of nature can give you the entire history of the universe, from the beginning to the end. The evolution of the universe follows the laws of nature. However, these laws of nature cannot tell you where you are now in this time axis. Physics is completely useless in telling you how long it has been since the big bang. The moment NOW can be any point on the time line, depending on when you ask the question. It depends on when you are born and when you ask this question during your brief existence. How long it has been cannot be derived, but has to be observed. In other words, when is “now” is completely outside of the domain of physics. If you know how long it has been since Big Bang, the equation of physics can tell you what scenario you should be seeing, which star should be evolved to what stage, etc. But why is the NOW moment now is completely outside of physics. Time is completely mental in this sense. We all feel the present moment, but the present moment keep slipping by.

If there is really a Universal Mind, then this sense of time flowing by is just one characteristic within this Universal Mind. The state of this Universal Mind defines which “now” is now. The Mind is the one who is playing the movie. Just like the computer clock defines which program has been carried out to which point, the Mind determines what moment is NOW.

It is a beautiful idea, indeed. It is a new way of looking at things.

## **Epiphenomenalism**

As science advances, the philosophy of materialism has grown in importance because the more science advances, the more it achieves following materialistic approach. Reductionism (to materialism) is the guiding principle in scientific research.

So far we have not found any violation to the philosophy of materialism. At most, materialism is viewed as insufficient in some area, but never outright violation. Outside of the mental domain, everything seems to have a materialistic based explanation. Even within the mental domain, neurological events also can be explained in terms of known chemistry and physics.

One reason that we have been unable to find contradiction in the materialistic approach is probably because the effect of the mind on matter is epiphenomenal, that is, it has no effects. Whatever the mind does, it cannot change the physical world, just like the CPU cannot, in general, change the software it is executing, but rather, can only faithfully carry out the rules laid down in the software. If the mind can change the material world, somewhere we will find a violation of some laws of this physical nature. If the mind can cause some change in the brain that will

otherwise not change on its own, we will find evidence of intervention. But so far, we have not found any evidence of intervention. We have not seen any brain process that indicates that any law of chemistry being violated. We have not seen any diffusion of matter against concentration gradient, for example (from dilute region to concentrated region, sort of upstream). We have not observed any violation of the law of conservation of energy. Mind over matter has never been convincingly demonstrated. The physical world, including our material brains, seems to be causally closed. The effect of the mind seems to be epiphenomenal, just like the CPU's action on the software is epiphenomenal: CPU cannot change the code it is executing.

## **Problem with Epiphenomenalism**

Despite the beauty of the Universal Mind hypothesis and the way this concept and epiphenomenalism play out in combination, epiphenomenalism is not without its problem. The problem is in what David Chalmers labeled as the third order phenomenal judgement, discussed in his 1996 book "The Conscious Mind".

Let's trace back to why we propose an immaterial Universal Mind to begin with. We found that as we experience the world, the quality of those experiences cannot be explained by material moving around in some system that we take as our brain. Materials moving

around will simply result in other material moving around. It is simply impossible to translate movement in a three dimensional environment to some kinds of feeling, which has nothing to do with the three-dimensional space. (“I feel happy!” “Where do you feel happy?”) The association between our mental experience and one particular piece of gray matter is deeply mysterious. We basically come to a point that we are forced to proclaim, no matter how the material world works, there is no way our feelings can be generated as a result of those materials moving around in some heads. So we propose that we need an extension to the materialistic understanding of ourselves in order to accommodate the mental part, and the fact that we are participating in this physical world as conscious observers. We propose that we are basically different manifestations of a Universal Mind who, through our many different physical bodies, is experiencing the universe as it is. We are this Universal Mind at different instances, like the way different Sims characters (as in the computer game Sims Family) are different roles played by the same CPU in a single CPU computer system. As the Universal Mind is experiencing the world through you and me, we have qualia. However, the Universal Mind nevertheless cannot assert any effect on the physical world because the physical world is causally closed. The Universal Mind is playing and watching a movie but unable to change the course of the movie. Without the Universal Mind playing the movie,

the movie will not play and there is no time and no world. As a metaphor, we notice that the CPU cannot assert any influence in the virtual world that it is simulating either because the virtual world is completely specified by the software layer and only the software layer alone defines the virtual world. The software is casually closed. The CPU is just faithfully playing out the virtual world specified by the rules in the software, the process we refer to as “executing the program”. As the CPU is epiphenomenal to the virtual world, the Universal Mind is epiphenomenal to the physical world.

Now, within this beautiful idea, there lies a problem, which is generally true to all epiphenomenal models of the mind-body relationship.

If qualia are strictly things of the mental domain, something that only belong to the Universal Mind, then qualia should not be something that the physical body should be aware of and can refer to. That is, if qualia are mental objects, then the physical body should not be able to talk about it because it will be unaware of it. Any reference to qualia is necessary coming from the physical layer because it is the physical brain that composes any sentence coming out of our mouth or going into the word processor. If the mind is epiphenomenal, this has to be the case. And yet, the fact that there are people (i.e., many philosophers of the mind) who are baffled by the existence of qualia, and can openly express and discuss

their qualia, implies that the physical brain is aware of the existence of qualia. If epiphenomenalism is right, then the mind should not in anyway influence the world. But by virtue of its experiences, which we called qualia, it caused many physical bodies (including this author) to behave in a way they would not otherwise behave (such as writing this book). The mind thus exerts an observable effect on this physical world.

Or maybe not. According to standard epiphenomenalism, all qualia have a one-to-one correspondence with brain states. The physical body refers to some physical condition such as lack of food, and the mind feels the condition as the quale of hunger. Even though the physical brain does not feel the real feeling of hunger, the brain nevertheless refers to the condition as hunger anyway. Maybe when the brain talks about the existence of qualia (the mind cannot talk because it is epiphenomenal), the brain is actually referring to its internal states, which cause those qualia our mind feels. Therefore, to the brain, there are no qualia. But it refers to them as qualia anyway. In so doing, it must have been mistaken. Maybe it is in this sense that some people are led to believe that qualia are illusions. In this view, when we refer to qualia, we (the talking we, i.e. the brain) must have been mistaken. Even if there were no mind and no qualia, the physical brain will still talk about qualia. In other words, even zombies can talk about qualia. So, our

talking about qualia cannot be used as a justification for the existence of qualia. That is, we cannot be trusted on our claim. So, there can be no qualia. The “qualia” that caused us, the thinking brain, to propose the concept of the mind is a mistaken identity, therefore invalid, to begin with.

Epiphenomenalism thus lead to the dismissal of the concept of the mind altogether because the concept becomes redundant, and that causes the dismissal of epiphenomenalism itself.

Therefore, epiphenomenalism leads to its own dismissal by either weakening the premise for the existence of the mind, or leading the brain to talk about qualia, an act that directly violates epiphenomenalism.

Let’s see how this plays out in our CPU/Software metaphor. It is as if a character from the Sims Family suddenly realizes that there must be a CPU running the entire show (program). There must be a CPU which is responsible for its existence. How in the world can it possibly know that? How does it know anything outside of its virtual environment? As the Sims character can only explore inside its virtual world, the virtual world is its entire universe. The Sims character, therefore, has no way of knowing anything outside of its own universe, and the CPU is outside of its universe and is in a completely



different realm and has to be completely transparent to the Sims.

But by being baffled by the existence of qualia, and realizing that no physical processes can produce experience, the physical body in the physical world seems to have the information about qualia (otherwise how would the brain of David Chalmers produce that book titled “The Conscious Mind”?), thus qualia is not strictly something in the mental domain. So, we come to a paradox. On the one hand, the Hard Problem demands an extension to materialism and forces us to introduce something purely mental to account for the fact that we are conscious. And in order to avoid the possibility of contradicting the understanding that the physical world is causally closed, we require that this mental thing be epiphenomenal. On the other hand, if this mental thing is truly epiphenomenal, the existence of this mental thing should be completely transparent to us and we should not be baffled by it. But the fact that many of us are baffled by our own existence and being conscious implies that the mind cannot be truly epiphenomenal because it has caused the bafflement itself. And that is a serious problem.

So, maybe epiphenomenalism is wrong, and the physical world is not causally closed. If this is the case, then given enough time, somewhere we will find some brain process

that will contradict established physical laws. We will have to wait for that day to come, if it will ever come.

This is a big claim. It is a claim that has already been made by Avshalom C. Elitzur in 1989, and his claim has been discussed by David Chalmers in “The Conscious Mind”, in which Chalmers disagrees with this possibility. On the other hand, if the Universal Mind does exist, how can it not know about its own existence? Shouldn’t this reveal itself as self-knowledge?

We mentioned above that we have this so-called third order phenomenal judgement. It is a good place here to know what are the first and second order judgements, and why the third order judgements are the most problematic.

When we sense a certain feeling, such as experiencing pain, the raw pain itself is a first order phenomenal judgement we have. It is painful! This is a statement that even a dog and a cat, if we take them to be conscious, can make, and this is reflected in their behavior to avoid the pain, such as retracting from fire. The raw feeling is something a mind theory can explain well. The physical body intake the percepts, mind feels the pain. In parallel to the brain senses a certain brain state representing harmful condition, and the brain takes action to avoid it, and in doing so, the brain changes into another state which is interpreted as harmless, and the mind feels the

relief. We, the mind, thus have this first order phenomenal judgement.

The second order phenomenal judgements are the knowledge of having the raw feeling. Instead of “it is painful”, we suddenly realize that “I am in pain”, “I am having a pain experience”. The difference between “it is painful” and “I am having a Pain experience” is that the focus was on the raw feel itself in the first case, but on the fact of “having an experience” in the second. As Chalmers puts it, the first order is about the object of the experience (pain), and the second order is on the experience itself, as if you just stand outside of yourself, analyzing some person having this experience, and this person happens to be you. Now, a dog or a cat may or may not have this type of second order judgements, i.e., be able to stand back and think about itself having an experience. It is even possible that some people never in their lives stand back and observe themselves having an experience. The first order and second order judgements are different in that the quality of the feel is different. If you are in pain, then the feel of being in pain is different from the feel of knowing that you are in a state of pain. Knowing yourself in pain can actually take some of the painful experience away because you have partially become an observer rather than the feeler and the quality of the feel changes. The mind theory is also capable of taking into account the second order judgements. In fact,

it is uniquely capable of explaining it because we can use the “eye of the mind” to do self-observation. The mind is aware of the body having a certain experience. It does not matter if the mind is epiphenomenal. The mind only absorbs the information and becomes aware of the fact that the body is in a painful state. Of course, this awareness is also occurring in the physical brain as well. It is simply a different brain state from the state of feeling the raw feel. Any action, if any, resulted from such awareness will be explainable by brain physiology. The mind is just there to feel the brain state in the language that it understands, i.e., the quale. The mind can remain epiphenomenal.

The third order phenomenal judgements are the opinions/questions about the knowledge of having raw feelings itself. To be baffled by the existence of raw feelings which we refer to as qualia are certainly a third order phenomenal judgement. In this type of judgements, especially if the judgement is expressed by conversations or writings, the supposedly epiphenomenal mind is causing a physical action. The existence of the qualia that belong to the mind is causing some physical action. But the mind is not supposed to cause anything physical because the physical world is causally closed. Therefore, we have a paradox.

Therefore, as unlikely as it may seem, the mind, if exist, may not be truly epiphenomenal. We may find evidence

of the mind tinkering with the physical brain, and some brain process may violate laws of nature. This is an exciting claim that we need to look into. The place to look is those physical brain processes that lead to bafflement.

Thus the CPU-software metaphor of the mind-body interaction may need some modification. Perhaps, indeed, the CPU does change the software. The CPU modifies the software so that some Sims characters are self-aware and can become baffled by their own existence.

## **The quantum reality**

At one point, quantum physics seemed to require a conscious mind as an observer: To actualize REALITY by collapsing the quantum wavefunction through the action of observation.

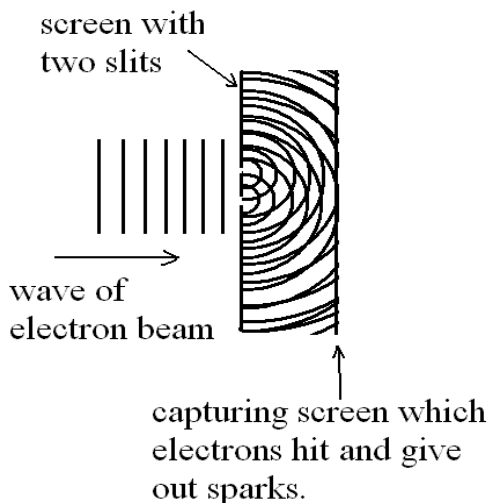
As we divide matter into smaller and smaller components, the dust particles we end up with behave more like waves than dust particles. These tiny particles are described by what physicists call the wavefunctions, which are just mathematical functions showing the probability of detection of a particle in space. The study of our material world therefore turns into the study of these wavefunctions and the way they evolve. The fundamental layer of physics is no longer the good old Newtonian

mechanics or Maxwell's electromagnetism. Instead, the fundamental layer of physics is now quantum mechanics. As it was originally formulated, quantum mechanics has two parts. The first part is the continuous evolution of the wavefunction of a quantum system under external interaction according to Schrödinger's equation. The second part is the sudden collapse of this wavefunction, turning probability into actual reality (an actual event) when an observation or measurement takes place.

The conceptual inconsistency in the original formulation is in the question of what constitutes an observation. Conceptually, there should be no distinction between an observation and a regular interaction because an observation is no more than a quantum system interacting with a piece of lab equipment causing some change of state of that equipment which an observer can observe. In the absence of a conscious observer, both equipment and quantum system are just two regular wavefunctions interacting with each other. It should not be distinguishable from a regular interaction, which should result in a smooth and continuous evolution of the wavefunctions according to Schrödinger's equation. Why is there a sudden collapse? Is it really because of the conscious observer?

When a beam of electrons passes through a screen with two parallel slits cut-outs (the two-slit experiment), those electrons that pass through the slits will interfere with

each other, just like two waves would. If one looks at the pattern on the second capturing screen placed behind the first screen, on which the electrons hit and give out sparks, one will see the dark and bright fringes, typical of wave's interference pattern. In this regard, the electrons behave like waves when traveling in the space between the two screens.



But when these electron waves hit the second capturing screen, they give out a lot of sparks and reveal the locations of the electrons as particles. The bright fringes are the places where more electrons hit, the dark fringes are the places where fewer electrons hit. On the capturing

screen, the probability waves got turned into actual particles. If the electrons are waves, then why do they spark like particles? But if they are particles, why do they interfere with themselves like waves and show the bright and dark fringes on the screen? This is a typical example of the wave-particle duality of matters. We just have to accept the fact that matters travel like wave. But when we make an observation, they reveal themselves like particles: The collapse of the wavefunction.

Stranger things happen when we turn down the electron beam intensity. First of all, we will notice that the pattern on the capture screen becomes dimmer. As we turn down the electron beam intensity even further, what was once the bright fringes becomes bands of many sparks. In fact, when the sparks were many, we failed to see single sparks. Instead, we saw a band of bright fringe. Now that the beam intensity is sufficiently low, the continuous band of bright fringe turns into a band of many individual sparks. As we lower the electron beam even more, the many sparks will becomes some sparks here and there. The once bands of bright fringes are the places where there are occasional sparks, and the once bands of dark fringes are places where there are no sparks (that why they were dark in the first place) at all. Now, if we set the electron intensity so low that there is only one spark every minute, we know we are sending one electron through every one minute. And if you look at where the sparks



occur, you will notice that it follows exactly the pattern of the interference fringes. If you record where the electrons hit the screen, and if you wait long enough to get enough sparks to form a pattern, you will recover the interference pattern.

Since the electrons are sent through the slits one at a time, why is there still interference pattern? What exactly is that single electron interfering with? It is interfering with itself that went through the other slit! A single electron is a true wave because it goes through both slits at the same time and interfere with itself afterward, giving rise to the interference fringes.

Even if you send one electron through at a time, the single electron still interferes with itself just like a wave will. No matter which slit the electron passes through, it seems to know the existence of the other slit and still interfere with itself, the self that passes through the other slit. In fact, it is completely impossible to tell which slit an electron passes through without causing the electron to materialize first. If you try to observe which slit the electron passes through, the electron materializes in one slit and you immediately destroy the interference. Once you observe an electron passing through one slit, then the wave has been collapsed and it no longer passes through both slits at the same time. But if you don't try to find out, the single electron behaves like wave, and passes

through both slits, then interfere with itself after the two-slit screen.

The observation process thus realizes the existence of the electron from an extended wavefunction which was just a probability wave. Physicists keep asking why measurement process does not obey Schrodinger's equation in a smooth way? Isn't the wavefunction supposed to evolve smoothly according Schrodinger's differential equation, even under the influence of external interactions? Why is there a sudden collapse when there is a measurement? Why is measurement different from regular interaction? Measurement by whom? Why does it need to be two parts to quantum mechanics?

This two-part interpretation of quantum mechanics is called the "Copenhagen interpretation" because that was where the originators collaborated and developed the idea. Physicists struggled with the concept of an electron having no location. Not that the electron has a location at a given time but just not known to anyone, but no location at all. The thinking that there are hidden variables that define an electron's position and other quantum states but they are just unknown to anyone experimentally is called the "hidden variable hypothesis". But this hidden variable hypothesis has been proven wrong by the violation of J.S. Bell's famous inequality equation. If there were hidden variables, if electrons do have positions and momenta well defined at any given moment, even

though they may be experimentally unknowable, then Bell's inequality would have stood. But as it turned out, experiment showed that it is violated. It is now firmly established in physics that there is no hidden variables. (Bell's equation did not deal with positions, but spin instead. However, the implication is the same.) An electron is usually spread out in space like a wave without a real location. It can be anywhere. Not that it has a location nobody knows, but it indeed does not have a physical location until it is actualized by an observation. The probability of being at a given point in space is given by the square of the wavefunction at that point. A spread out electron can even pass through two adjacent slits in the "two slit experiment" at the same time and interferes with itself, like an extended wave will. But yet at the moment of observation, when it materializes (or is realized), the extended wave collapses into a point instantaneously, behaving like a particle, thus the description "elementary particle".

Physicists have long been struggling with the conceptual difficulty with this sudden collapse of the wavefunction, which otherwise evolves smoothly most of the time except at the moment of observation. Is there really a role played by the conscious observer? Does recording the result for someone to look at 500 years later constitute an observed event, even though it won't be looked at for another 500 years? Is a dog a conscious observer? What

constitutes a measurement? Interaction alone is not enough to be a measurement because matter interacts constantly with their environment. For some interactions, the quantum aspect of the system is preserved. Despite its constant interaction with the atomic lattice, an electron in a bulk metal nonetheless behaves like a wave with its wavefunction spread all over in the metal body. But when an electron hits a screen and gives out a spark of light, this interaction collapses its wavefunction. But the fact is, if no one is observing, the electron goes on with its afterlife after being absorbed into the screen, forming perhaps a localized wave packet as a bounded electron in an insulator. The whole process of electron hitting the screen should be described by the Schoedinger equation and the wavefunction should have a smooth evolution from a plane wave to a localized wave packet. At no time is a collapse of the wavefunction required. This is the conceptual difficulty between the two parts of quantum mechanics: The wavefunction's smooth evolution (a smooth unitary transformation) under interaction according to Schoedinger's equation and its sudden collapse due to some interaction which we call measurement involving a conscious observer. There is no fundamental difference between an interaction we called measurement and an interaction we called an interaction potential.

At one point, the mind had been given the role of the actualizer of reality. It was thought to be the involvement of a conscious mind that collapses the wavefunction of a measurement. This picture fits nicely with our Universal Mind hypothesis. In our case, it is particularly beautiful because we don't have the problem of what qualifies as an observer. We don't need to ask if a dog is a qualified observer. The existence of the Universal Mind as the observer eliminates the measurement problem. The Universal Mind can act as an observer through you or me, or anything that the Universal Mind participates in, perhaps a dog. After all, we are all the same conscious being. If this is the case, we will have a beautiful theory, and giving quantum mechanics a way out.

But to balance this old view with recent development (late 1990's to early 21<sup>st</sup> century) in the research into the interface between quantum physics and classical physics, we need to note that new research casts doubt on the original Copenhagen interpretation, raising the possibility that the wavefunction never collapses, and thus destroy our beautiful thinking.

This is the decoherence theory. In the decoherence theory, known as the existential interpretation of quantum mechanics, the environment plays a key role in quantum to classical transition (classical in the sense that probability is actualized into reality, the kind of reality that Newton dealt with in classical physics): How on earth

can some fundamentally wave-like things give rise to a piece of rock put in front of us which feels so solid, for example. The concept is that a measurement process is a process that put a pure quantum mechanical system in direct contact with an environment that is multivariable and multi-dimensional. In particular, the observer, usually a human brain, is a highly non-equilibrium dissipative system which is in constant contact with its own environment as well. The brain needs external oxygen to function. It needs blood to flow. An observation is therefore a process of putting a quantum system in contact with a human brain, and other immediate environment. When a quantum system is in contact with its environment, it interacts through the Schoedinger equation and its wavefunction evolves “smoothly”. Even though the system evolves “smoothly”, but it quickly lost its quantum coherency after the so-called decoherent time, which can be very short. Yes, very short but smooth. So, the environment essentially suppresses certain quantum states that are unstable and are incompatible with its environment and evolves the system into states that are compatible with the environment and the classical properties emerge. So, it is not the consciousness or the mind, according to the existential interpretation, but the environment with many degrees of freedom that, once a quantum system is opened up to, “collapses” the wavefunction. But it is not a real

collapse, but rather an extremely short but smooth transition consistent with the Schroedinger's equation.

If this is true, then the mystical role of the conscious observer in the original quantum mechanics formulation is no more.

Of course, future research can still put the mind back into the game if the existential interpretation turns out to be wrong.

However, even though the mind may be kicked out of the role of actualization of reality, it may still have an important role to play: The self determination of the universe, in addition to the role of carrying the “now” moment forward.

If the Universal Mind is indeed an irreducible component of the universe, it could be the determining factor of those universal constants in physics such as the gravitational constant, the electron charge, electron mass, proton mass, and etc. It has been pointed out that if the charge to mass ratio of an electron is not what it is as we observed, then the atomic spectrum of all elements will be different from what they are now. Chemical reactions will not go the same way, or same rate. Biological evolution may not be able to proceed to the point it has on earth or other parts of the universe, and self-conscious organisms may not have been possible. The fact that we, the self-conscious

beings on earth, are here to observe the universe is such a fine-tuned result that our existence is a highly improbable but yet realized phenomenon. In the book “Cosmic Jackpot-Why our universe is just right for life” (the same book goes by another name as The Goldilocks Enigma), Paul Davis speculates that the universe must have a self tuning process which could involve a backward in time influence of the early universe by its future version, so as to make the future universe suitable for life form. His idea is that the universe is self-tuned to be suitable for life. If backward in time influence is possible (not ruled out by science in the ordinary sense as an antiparticle is a backward in time traveling ordinary particle), then the universe will settle down on those fundamental constant values that will eventually lead to the formation of life form, thus consciousness.

Along the same line, the Universal Mind could play such a role of self determination of the universe to make sure that the universe indeed chooses those values for its fundamental constants such as the gravitational constant and the fine structure constant so that conscious life forms can exist for the Universal Mind to express itself through these viewpoints. In other words: We, the Universal Mind, are self-determined. We ensure our own existence. It is quite an interesting picture.



## **Section VI**

### **Concluding Remarks**

## **Random Thoughts on the Meaning of Life**

When a person is asking about the meaning of life, he or she is probably dissatisfied with life. During the annual Oscar night, stars after stars go on stage to receive their awards, and to thank the people who they think deserve thanking. In particular, many stars thank their parents. They thank their parents for bringing them into this world to enjoy this moment of glory. At this moment, meaning of life is self-evident.

But when one is in trouble, when the joy of living is somehow diminished, and the pain sets in, the question of “what the heck am I doing here” becomes acute. In a way, this is in the biology of intelligent beings that enables us to step back and ask the bigger question in times of trouble. Asking for the meaning of an action is to try to put the purpose of the action in a larger context, one level above the current level, so as to make sense of it in terms of a higher-level perspective. The action of meaning seeking is an action of self-correction in times of dead-ends. If you are trying to open a lock, you try some tricks. If you get it to open in the first few trials, everything is fine and you move on. But if you get stuck for an hour, you may step back and ask, what is the meaning of opening this lock? Then you realize you are just trying to see if there is a bottle of wine you thought

you left in the locked cabinet. But there is a hole on the back that you can peek through. You promptly go around and shine a flashlight through the hole and confirm there is none. And you move on to some other places. By asking for meaning, we can get ourselves un-stuck. The sign of us being stuck is the feeling of discomfort and discontent. So, when one is asking the question of meaning of life, life is not going smoothly for this individual. He or she needs to be un-stuck. But the meaning of life is special because life is not an action that we choose to participate in. We are put into it without our consent. How do we un-stuck from life?

Paradoxically, one special thing that we all need to be un-stuck from is the fear of death. Even when life is going extremely well, when life is so meaningful and full of glory and joys, the fear of losing them all can often prompt one to ask for the meaning of life. King Solomon (the presumed author) sighed in Ecclesiastes at the future loss of everything he built, only to be inherited by somebody who had not built them. The eventual loss prompted him to wonder why he built them in the first place. “What does man gain from all his labor at which he toils under the sun?” he asked.

So, what is the meaning of life?

If all of us are different instances of the same conscious being, then we have found the reason for our existence:

Existence is our nature. We are the single Conscious Being, which is one fundamental property of the universe, who expresses itself through the many viewpoints provided by the many capable material brains in the universe. In other words, our nature is the universe itself. You, I, and the many other conscious individuals are the same Conscious Being looking through different viewpoints. Instead of being the same Self separated by time like your current self and your future self, you and I are the same self separated by space.

We are the necessary being! We have this God-like nature.

If I hurt you, I hurt myself. If you hurt me, you hurt yourself because we are the same being. The death of one physical being only means the disappearance of one viewpoint. The Universal Mind, does not die. We only get closed out from some viewpoints when those physical systems no longer sustain viewpoints, like the closing of windows. Just like the CPU closing one program when that program has run to its completion, the CPU has one fewer program to express itself, but the existence of the CPU itself is not affected by the closing of a program.

So, if we are this Universal Mind, then life is fair. The Conscious Being experiences them all. Joys, pain, boredom, excitement, love, etc.. All are experienced. The purpose of life is perhaps to experience all the qualia

there is to experience. Pain, which we individuals avoid for obvious reason, may be an important quale the Conscious Being needs to experience. Joy, which we individuals are attracted to for obvious reason, are perhaps another type of quale that the Conscious Being needs to experience. Obviously, these are just speculations. But the speculations are based on the fact that feelings are the only property that is truly in the mental domain, and it is the feeling component of our daily life that brought out the dilemma of our personal existence, and therefore, the only important factor associated with the Conscious Being is really the qualia. Without qualia, we don't exist.

It is not the wisdom or knowledge because the physical brain takes care of all that. As the physical brain ages and deteriorates, knowledge and wisdom go with it. In a deteriorated state, a person turns into a complete feeling being, just like a newborn baby whose brain still does not have the capacity to "think". Opposite to what some other authors advocating the Universal Mind concept, I don't believe one will become much wiser by "making a spiritual connection with the Universal Mind" because I believe the self is the Universal Mind looking through one physical body, and wiser or not is purely the brain function of that particular physical body.

If we are indeed this Universal Mind when it looks through many different viewpoints, then one question

immediately arises: Are there preferred viewpoints? Are there viewpoints that are special? In ordinary language, are there lives that are more worth living than others from the point of view of the Universal Mind?

What does it mean to us, the Universal Mind, to live through the life of a poet? What does it mean to us, as the Universal Mind, to live through the life of a drug addict and dying young? How about living the life of a clam, staying underwater in total darkness the whole time? Or does a clam have enough structure to sustain a viewpoint (is a clam conscious)? And then finally, why when we want to keep on living as an individual, we have to kill something (for food) in order to live?

These are all meaningful questions, and we ought to keep the search going. But the most important thing is: We know we exist, and we have a reason for it.

As for B. Pascal's question, (*"When I consider the short duration of my life, swallowed up in the eternity before and after, the little space which I fill, and even can see, engulfed in the infinite immensity of spaces of which I am ignorant, and which know me not, I am frightened, and am astonished at being here rather than there; for there is no reason why here rather than there, why now rather than then. Who has put me here? By whose order and direction have this place and time been allotted to me?"*) you know that you are not allotted this place and time. Instead you are

everywhere and forever. You are only astonished at being here rather than there, now rather than then because you are asking this question through one specific viewpoint, without realizing that it is the limitations of the viewpoint from which you are looking at the world make you ask this question. Once you realize that these limitations are not yours, but rather, the limitations due to the nature of your viewpoint, the question dissolves itself.

So, where are the Zombies, the soulless unconscious creatures that look exactly like you and me as individuals? Well, are there viewpoints that you, the Universal Mind, won't bother looking through, making them walking Zombies?

If you understand this counter question, you completely understand what I have presented.

## Acknowledgement

This book is an attempt to put my thoughts about my own existence into words. Since the time when I was in college, I have been deeply puzzled by my association with this particular era and this particular region of space (the place that I was born). So, when I read about Blaise Pascal's question, I knew I was not the only one who was baffled.

But this topic of existence does not seem to interest too many people. Those who are puzzled are in the extreme minority. A lot of people simply brush it aside, as "dealing with life" (getting married, buying a house, finding a better job, getting promoted, etc) takes higher priority. These are all very understandable. Pursuing happiness and avoiding pain is in our nature. Dealing with life is to avoid being crushed by life, and that is avoiding pain and pursuing happiness.

For those of us who find happiness in pursuing the meaning of life, this mental journey is well worth the effort. In fact, I cannot have a day gone by without thinking about it.

The draft of this book was written in a matter of weeks. As I read through my draft, my thinking refined, and the manuscript got further polished. In this process, I benefited a lot from the discussion with a friend Jim



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My wife believes nobody will read this book. Despite her doubt, her love and support remain strong. She, along with other dear members of my family, deserves my deepest appreciation.

## **About the author**

Kar Y. Lee received his Ph.D. in physics from the University of Washington. After a two-year post-doctoral assignment in a national particle accelerator laboratory in Virginia, he left the world of fundamental physics research for industry. Since then, he has been in various technical, managerial, and consulting positions in technology and product development. Philosophy, particularly that of the mind, is his life long passion.