Where does your personality reside?

The answer is easy for the majority of us: in our brains. For over the centuries, the Western common sense and thought have put both the mind and body into two different worlds. Still, this is a simplistic method. The recent neuroscientific research suggests that reality is very difficult.

As a matter of fact, the separation between the brain and body is not really clean cut. As a matter of fact, our mental functioning is strongly entwined with the physical realm. All the things ranging from the chemicals in our stomach to the lighting in our surroundings can play a big part in how we reason and feel.

By making use of realistic language and mind-bending thought research these book chapters explore the scientific and philosophical consequences of this more nuanced perception of the brain.

Chapter 1 - The majority of us view the brain as a transcendental object instead of a biological organ.

One of the most complicated structures in nature is the mammalian brain. The brain of a cow has billions of cells and trillions of neurological connections. It really is a surprise. Still, the mammalian brain is really more than only a complex – it's a tasty snack as well.

Yes, that's correct, the mammalian brain can be eaten. Considering a lot of fat and vitamins, it's very nutritious. Using the appropriate recipe, it can be made into a tasty soup or stew. Okay, if you're similar to the majority of the people, the brain isn't normally on the menu. However, this hasn't usually been the case. Archeological proof from Kenya reveals that animal brains were made a normal snack by ancient humans. It's just quite recently that its prevalence as food has reduced, particularly in the West.

Hence, what is the reason for hating to eat what could simply be a hearty and healthy meal? the reason is because of what the author refers to as the "cerebral mystique." We view brains as

more than only an organ. We view them as the place of the mind, as well as the source of the soul.

Our contemporary obsession with the exceptional nature of the brain began during the early 1800s when Franz Gall a German scientist spread phrenology. Phrenology asserted that someone's intelligence and personality could be mapped onto the size and shape of their brain.

In spite of being mostly wrong, phrenology made brains a hot subject. Popular people such as Abraham Lincoln and Walt Whitman experienced phrenological tests. Universities accumulated broad collections of brains in jars. All colonial projects were verified based on weak assessments between European and African skull shapes.

Definitely, few people believe in phrenology nowadays. Nowadays, our scientific knowledge of the brain is very nuanced. Decades of experiments reveal the brain is a complicated organ and its working is influenced by countless variables. Yet, the "cerebral mystique" stays strong.

Prevalent culture still portrays the brain as strange, mysterious, nearly supernatural. Just consider the images used with magazine articles on anything related to neuroscience: the brain is depicted as ethereal, floating on its own, covered in mystical blue or green light.

The following chapters will critique this illusion. We'll begin with the common belief that the brain and body are in some way different entities.

Chapter 2 - Just like other organs, the brain is wet, messy, and depends on a complicated combination of chemical processes to work.

What is the brain really like? The answer to that rests on the person you ask.

All through human history, the brain has usually been associated with the newest innovative technology. According to Plato, the brain was a chariot that was pulled by the horses of passion. During the 1920s, Arthur Keith an anthropologist compared it to a telephone switchboard. Nowadays, the most prevalent comparison for the brain is a computer.

At first look, the computer comparison works properly. Just like a computer, our mind has the capacity to save memories and process information. Just like a computer, the brain's neurotransmitters utilize electrical signals. Also, the composition of our brain, with its millions of entwined neurons, can look like a CPU's electronic circuits.

However, the brain as a computer similarity can just extend really far. As a matter of fact, the brain is very more organic.

Referring to the brain as a computer strengthens the brain-body difference. At times, this is known as scientific dualism. It's the wrong belief that the brain is basically different from the other organs.

Dualism mentions that instead of being soft and moist, just like a kidney, the brain is cool and calculating, just like a machine. That kind of depiction makes it look like the brain does its works just like a software program, making use of just electric impulses and rational algorithms. This is a little really simple.

Different from the dry silicon circuitry of your computer or your smartphone, the brain is completely organic. One-fifth of its size derives from fluids. This comprises of blood and cerebrospinal fluid, which is a clear liquid filled that consists of ions, nutrients, and signaling molecules. These whole things are significant to make things running well.

Also, although the brain's electrically-active neurons get the entire attention, there are other cells too. About 50% of the brain consist of glia, or "glue" cells. One time, Scientists believed that these cells, together with cerebrospinal fluid, were inert and basically gave structural support. But, the latest studies reveal these elements are as vital to the brain's thinking process as neurons.

In a study that was conducted at the University of Rochester, human glial cells were cultivated inside the forebrains of embryonic mice. When the rodents grew up, they displayed advanced cognitive skills. Also, they practiced running mazes twice as fast as their unchanged mate.

If all this seems difficult, you're correct. However, as the following chapter reveals, we shouldn't allow the brain's difficulty to outshine its biological origins.

Chapter 3 - Although the brain has a complicated component, it’s still likely to know how it functions.

If there is a thing we understand about the brain, it’s that it’s complex– really complex. Christof Koch a Top neuroscientist from the Allen Brain Institute, refers to our noggin “the most complicated thing in the known world.”

There’s a fact to this word– the brain is complicated. Consider the numbers. The typical human brain has approximately 60 billion neurons. Every one of these neurons consists of nearly ten thousand synapses. These synapses let neurons to keep nearly 150 separate connections. The outcome of all this is a network with trillions likely configurations.

It’s somehow overwhelming. Confronted with such difficulty, a lot of people turn away from science and move toward mystical clarifications for the brain’s running. But, concentrating on these astronomical numbers omits a vital point.

First and foremost, let’s make those numbers simple. Human brains basically contain billions of neurons; however, they can still function with much fewer. Consider one severe example from China, where it was discovered that a 24-year-old woman was missing her whole cerebellum. That’s about 80% of the brain's neurons! In spite of this, she could have and live a normal life with just slight impairments.

The animal kingdom shows a related dynamic. Corvids, which is, birds such as ravens and parrots, show extraordinary mental skills like social behavior and tool use. More astoundingly, they do this with brains of just ten milliliters in volume. That’s below 1% of the size of the human brain.

All this implies that difficulty is overrated. Although a brain consists of billions of separate cells, it just has a handful of kinds of cells. Therefore, instead of getting caught up in mapping out a brain’s trillions of connections – a task that is not possible even for supercomputers – rather, we can concentrate on knowing a smaller number of basic jobs.

Using this method has already produced results. Scientists have discovered structures known as cortical columns. These multicellular units are in charge of separate brain roles. Also, at a millimeter in diameter, they are very easier to examine than a billion separate neurons.

Future research concentrating on how these columns work together could be the way to understating the brain as a biological organ, instead of an indecipherable enigma.

Chapter 4 - Present brain imaging methods are not as perfect as they appear.

Have you ever thought of becoming a mindreader? Life would definitely be much easier if you could only look inside a person's head and check what they're truly thinking of. Well, new developments in brain imaging technology enable this dream to look like an actual possibility.

The most innovative approach for checking the brain is functional magnetic resonance imaging, also called fMRI. In basic words, this approach makes use of a small amount of magnetism in blood-born iron to monitor blood flow all through the brain. fMRI studies normally include giving a patient some kind of stimuli, then observing which aspects of the brain become active.

You've most likely had a look at the results: images of the brain where some parts are "lit up." Some scientists prefer to mention that these pictures reveal the spots of certain cognitive processes, such as taste, problem-solving, or feeling. But, there's more to the brain than meets the eye.

For one, the fMRI approach is not really accurate. The spatial resolution of the pictures, meaning, how precise the images can be, is restricted by the size of blood vessels, which are big likened to neurons. This signifies that scientists can just view huge changes in brain activation. This may omit little pockets of activity that are just as significant to any cognitive work.

Likewise, because blood flow variations are really subtle, any pictures have to be extremely processed to make them obvious. This signifies that all fMRI images are really a statistical sum

of hundreds of trials. These kinds of processing are susceptible to mistakes. A researcher from the University of California verified this by conducting an fMRI on a dead salmon. In spite of no brain activity, statistical processing still made images that looked to reveal a really active brain.

Lastly, in the media, there is the issue of how fMRIs are represented. Flashy headlines usually utilize brain imaging studies to make assertions that are not supported by science.

You may recall coming across an article in the years 2011 stating that brain scans showed people were in love with their iPhones. This was from a study that discovered that smartphones use higher blood flow to the insular cortex, a section of the brain related to love. But, the insular cortex is connected with every feeling. As a matter of fact, the study didn't mention anything about love.

In the future, enhanced methods may provide a more precise image of what's going on inside your head. However, till then, approach any huge assertion with a little bit of doubt.

Chapter 5 - Our minds are the outcome of complicated communications between our physical bodies and our biological brain.

Wish to have a look in the future? The Alcor Life Extension Foundation has an offer for you! For a few dozen grand, the service offered will freeze your brain in liquid nitrogen till a future time. When technology has improved well, they'll defrost it out and put it in a new body.

If this seems really simple, that is because it is. Even though your brain endures the process, that new "you" won't actually be you. The reason is that what we know as the "self" is not enclosed in the brain only. The body plays a significant part too. Take out one, and the entire system crumbles.

It's usual to visualize the brain as the navigator of the body. In this outlook, the brain is in the cockpit of the skull ordering commands to the limbs like Stand up! Sit down! Walk there! But, in

real life, it’s more like a two-way discussion. The body usually guides the brain. This is done through several mechanisms like blood sugar, hormone balance, and other physical signs.

If you’ve ever been in a risky circumstance, you understand the feeling of this. Your heart rate increases, your stomach tightens, your cheeks flush. This fight-or-flight reaction is teamwork between the pituitary gland in your brain and the adrenal gland close to your kidneys. When you’re afraid, both of these glands produce hormones to arouse the other. The outcome of this feedback loop: the physical and emotional feeling of panic.

However, this brain-body association goes deeper than feelings. Your body as well plays a part in your character. Think of the gut microbiome. This is the gathering of microorganisms that live in your digestive system. Various studies reveal that the character and health of this microbiome can have a severe impact on brain working.

A study that was conducted at McMaster University observed two groups of mice. The first group of mice was adventurous and bold, the second group was shy and timid. But, when scientists put the microbiome of the first group in the second group, these one-time fearful rodents started showing bold and outgoing actions.

We have this gut-brain axis in humans too. Research claims that it could play a part in everything such as controlling stress and anxiety to depression. Talk of possessing a gut feeling!

What other thing plays a part in our feelings? Our surround. The following chapter will carry on exploring how outside factors influence the brain.

Chapter 6 - Everything from your feelings and emotions to your intentional behaviors is affected by the outside world.

If you’ve ever attempted to study in a jam-packed cafe, you understand that a bit of noise can do so much to disturb your focus. It’s very evident that our environments can influence our cognition if we like it or not.

Therefore, how does the outside world get into your head? Essentially via the body's principal sensory systems. That's, taste, smell, touch, hearing, and sight. With these mechanisms, the brain gets a full amount of sensory data. By some approximations, these inputs bombard your brain with the approximation of ten megabytes of data each second. That's sufficient to simply overload a typical computer.

More significantly, this entire information has a direct effect on the activity of your brain. As sensory input hits your neurons, they respond. During the 1970s, Horace Barlow a neurophysiologist discovered that only one photon of light hitting your retina can activate three neural responses. And that adds up – at any specified time, 40% of your cortex is committed to processing information from your senses.

Due to that, your brain's activity is usually being pushed around by forces out of your control. A clear illustration of this phenomenon is a seasonal affective disorder or SAD.

If your optic nerves don't sense sufficient photons, they inform the area of the brain known as the suprachiasmatic nucleus to release melatonin. Melatonin is the chemical associated with drowsiness and sleep. Hence, those early sunsets in December led to an excess of this downer chemical flooding the brain. People suffering from SAD go through this flood of melatonin as a depressed mood.

Together with moods, our focus too is managed by outside forces. We usually consider attention as a top-down process, as a spotlight we shine on anything that interests us at a specific instant. But, just as regularly, attention is managed from the bottom up. Meaning, our brain is inevitably attracted to specific stimuli over others. Consider how we automatically turn our heads toward loud sounds.

Obviously, our brain, and hence, our action is subject to the impulses of the world that surrounds us. The following chapter will examine what precisely this may signify for the entire society.

Chapter 7 - Asserting that the brain is the only cause of human action ignores other vital contributing causes.

During one hot morning of August 1966. Ex-marine Charles Whitman gets a rifle and then climbs the 300-foot tower found at the center of UT Austin. For the next few hours, he shoots at innocent people underneath. When it's ended, 18 people died already.

What pushed Whitman to this meaningless genocide? That rests on the person you ask.

Therefore, what was the reason that Charles Whitman murdered 18 people? Some point to his brain. A post-mortem autopsy discovered a tumor on Whitman's hypothalamus and amygdala. These areas of the brain are responsible for regulating feelings. Did the tumor's found make that kind of violence unavoidable?

Or, were outside forces the reason? Whitman had a sad childhood and a difficult marriage. He had currently failed his educations and experienced an embarrassing court-martial from the marines. Also, Texas laws allowed it very to be very easy to purchase guns. Could these environmental causes be responsible?

These reasons signify two contending perspectives on human psychology. The first attributes the whole of a person's behaviors to the internal functioning of the brain. This perspective is at times known as neuroessentialism. The second view, states that human behavior is just the outcome of outside forces. This is called behaviorism.

The history of psychology has been a lengthy discussion between these two perspectives. And presently, neuroessentialism has the upper edge. However, while concentrating on the brain isn't usually bad, it can overemphasize its role in situations.

Consider another illustration, let's discuss teenagers. What makes teenagers behave really brash and rash? The neuroessentialist view would point out that it is their brains. Neuroimaging has revealed that the teenage prefrontal cortex – which is the region of the brain related to evaluating risk – is less formed than an adult's. Hence, a teen's immature action is the brain's doing, right?

Not essentially true. There are other physical reasons as well, like hormone spikes, which play a significant part. The manner society is structured matters, as well. Teens are normally provided with less responsibility and viewed as less serious than their elders. This could form a setting where more mature action doesn't just have an opportunity to flourish.

If we usually consider the brain as completely responsible for our behaviors, we might as well omit the bigger picture. The following chapter explores this dynamic in depth. We'll look at how this neuroessentialist perspective influences how we view mental illness.

Chapter 8 - We have to be cautious about over-emphasizing the brain's part in mental disorder.

One morning, you wake up with stuffy nose, sneezing, chills down your spine. You've caught a cold. Physical sickness occurs to everybody. It's a struggle and not a personal failing.

Nowadays, mental illness is treated in a similar way. This is a huge advancement. Formerly, psychiatric illness was believed to be the outcome of moral shortcomings. Patients were viewed as "degenerates" and at times they were locked away in terrifying situations.

Currently, like how pneumonia is viewed as a disease of the lungs, illnesses such as schizophrenia or depression are considered as illnesses of the brain. This framing is definitely more humane than the ancient model. However, in spite of this, this neuroessentialist outlook is anything but perfect.

Therefore, what are some issues with considering a harsh neuroessentialist outlook?

For one, asserting mental disorder is only a brain disease that causes a stigma. At times, Psychiatric patients will understand this framing to signify that they possess a damaged brain. Even worse, the whole society may do the same, with terrible outcomes

The damaged brain stigma was the foundation for a lot of inhumane social programs. Throughout the twentieth century, a lot of patients with mental disorders were sterilized on this

basis. Governments claimed that people with damaged brains were hopeless, and hence, these people with mental disorders should not be permitted to reproduce.

Furthermore, categorizing mental disease as a brain disease can make us ignore other likely causes and cures. Consider the case of syphilis. As this disease advances, it brings about a lot of psychological symptoms as well as delirium and loss of motor control. But, these illnesses are not the outcome of a “damaged brain.” They happened as a result of the bacterium treponema pallidum. Also, the cure is not an aggressive brain treatment or psychological care; however, a simple antibiotic.

Lastly, the neuroesentialist outlook can hide the social and environmental determinants that add to mental health. Various studies have revealed that although some mental health issues are really reliant on genetics, others, like depression, bipolar disorder, and anorexia only occur under specific circumstances.

What determinants lead to these illnesses is still a subject of study. Although current research reveals that conditions like unemployment, lack of source of income, or inadequate social networks can all be related to disorders such as depression. Hence, if we are interested in decreasing these mental health conditions, we have to do more than just treat the patients only. We have to address certain areas of society as well.

Chapter 9 - Assurances about improving the brain with neurotechnology are typically not realistic.

A crowd of nanobots modernizes your neurons. All of a sudden, you can speak French fluently. Digital nodes link your cortex straight to the internet. Nowadays, you can email your feelings to a friend. What about your car? You can drive it with your mind.

These are only some attributes that transhumanists such as Raymond Kurzweil and Michio Kaku see in our future. These thinkers, as well as others similar to them, base their predictions on the developing science of brain hacking. Here, hacking entails controlling the brain with the utilization of digital technology or other gadgetry.

Are these forecasts sensible? As a matter of fact, they have been some achievements in making brain-machine interfaces. In a popular incident, scientists inserted lots of microelectrodes into the brain of a woman that was paralyzed. The woman was able to order a robotic arm to finish basic work by utilizing these devices.

As incredible as this innovation was, the future transhumanists visualize is still possibly more of an imagination.

One of the causes, why brain hacking may be more of a dead-end than a way forward, is its narrow concentration on the brain itself. The hacking proposes that the best method to improve a human is to avoid the body and attempt to directly enhance our grey matter. But, interventions to the brain are risky. Even putting little electrodes could cause issues.

It’s very much easier, and more effective, to make alterations outside the skull. Dwell on it. Why should you risk brain damage attempting to enhance your mental math skills when you could only use a calculator?

Even difficult mobility issues can be fixed with peripheral neurotechnology. In 2015, researchers from Johns Hopkins University were able to assist a man that didn’t have any arms to get control of robotic ones with a method known as targeted muscle reinnervation. This technique involved attaching circuitry to nerve endings found in the shoulders and chest – no brain surgery needed.

Even though brain upgrades became a reality, there’s no assurance that their advantages would be available to everybody. Think about the chemicals called nootropics. Some scientists assume they can upgrade brain ability. But, even the popular varieties can be really costly that just people with big incomes can use them.

A universe where some people get access to great brains whereas other people are left behind could cause severe social issues.

Chapter 10 - Your brain with the absence of your body just wouldn’t be the usual you.

Let’s close this with a thought experiment. Assuming a terrible thing happens: your life is reduced as a result of an unanticipated disaster. Fortunately, the people you love sign you up for an experimental service. Your brain will be cryogenically kept in a vat.

Medical technology has improved decades after. Scientists create an advanced bioelectronic neural input-output interface. Frozen brains may be revived with this new machine. Your body may have perished; however, your brain will now experience the universe as a rich computer-generated simulation.

They switched on the machine and the machine comes buzzing to life. What will be your new life?

Let’s begin with the benefits of this case. Making use of the sensory input features of this new bioelectronic software will make your brain go through a nearly limitless range of simulations. Do you wish to watch the sunset over the Dalai Lama’s palace in Lhasa? Done. Those pictures can be served to your brain. Do you wish to have discussions with your best historical people? Easy. The software can offer an estimate.

But, there’s an issue. These simulated experiences won’t just be the normal thing with the absence of your body. In the absence of the physical reactions of your corporeal form, your feelings will be numb and your experiences dull.

If you do not possess lungs, a lovely view can’t take your breath away. A simulated white-water rafting trip will give no excitement in the absences of the thump of a beating heart or rush given by adrenaline. Also with simulated seasoning, eating the most properly made food will not give the same fulfillment without the response from your guts.

Also, the freedom to have over your simulation is a little bit of a curse. The majority of what makes you “you” are your environments. In the absence of a stable physical surrounding, actual social relationship, and each of the accompanying ups and downs of a grounded life, your identity will vanish. In the absence of context, your brain can’t make any meaning.

In spite of the best software, a vat is no substitute for the actual world. Our brains are incredible bits of biology; however, they still remain biological. They only function when joined to bodies, and our bodies are usually connected to the world that surrounds us.

The Biological Mind: How Brain, Body, and Environment Collaborate to Make Us Who We Are by Alan Jasanoff Book Review

The brain is not a strong supercomputer directing our bodies from above neither is it a transcendent seat of the soul. The brain is a biological organ, just like a kidney or a heart, and it can be understood via scientific analysis. What we consider as our “self” is really the outcome of a difficult connection between our brains, our bodies, and the world that surrounds us.

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