THE 7 DAY BRAIN POWER TURNAROUND

become the one who out-thinks, out-performs, and out-lasts everyone else

CHECKLIST: DAY ONE
Welcome to the Simpleology 7 Day Brain Power Turnaround. This 7 day checklist will walk you through the course day-by-day. The first step is to watch the introductory animation. You will find action items throughout this checklist with a checkbox to their left (just like the one below). As you complete each action remember to mark off that action as complete.

Watch Video 1: Introduction

The human brain is the single most complex system known to occur in nature. It hosts the physical processes that allow all thought, perception and emotion.

Just reading this sentence involves extraordinary neurological processes.

As you now read, complex patterns of activity in a network of areas (mostly on the left side of your brain) are taking place - your occipito-temporal area is helping you quickly recognize words that you are highly familiar with, while your inferior frontal gyrus and parieto-temporal area are simultaneously analyzing those with which you are less familiar.

Your abilities to learn, reason, think, feel emotion, perceive the world around you, retain cherished memories, dream of your future and plan your pathway to it all involve even more extensive and complex processes.

There exists nothing with which you are entrusted that is more deserving of attention and care. Nor is there anything which when optimized can lead to life improvement so quickly.

When one buys a new pet it is usual to determine what food will nourish it correctly, what types of play it enjoys, how much rest it requires and how to keep it safe from harm. When one buys a new car it is usual for the new owner to find out what fuel it requires, what mechanical servicing schedule should be followed and to possess a desire to keep it protected as much as possible.

Your brain is not only the most important ‘thing’ you can control but it is you in any meaningful sense. Compared to a pet or a car, how much do you really know?

What food is best placed to nourish it?

What are the best ways to keep it healthy and protected?

What forms of training and challenges does it crave?

How can it's performance be increased?

This seven day course will answer these questions, empower you with a greater body of knowledge about your brain and suggest to you a series of specific actions and tools to achieve immediate improvements to it's functioning.

You have already watched the first animated video, and now you should go on and watch the remainder of them in order and take the quizzes for each. These videos will illustrate the key ideas you need to grasp to make your brainpower turnaround possible. You will find the quizzes as a link to the right of each video in the ‘Lessons’ tab of this course in your ‘My Training’ area of Simpleology.
Getting Started....Or not.

As you will learn during this course, engaging in new modes of thought, acquiring new knowledge and participating in debate are all important ways to keep your brain healthy and active. What is presented in the remainder of today’s checklist is a summary of how your brain came to be and to give you a general introduction to its functional anatomy.

It is concise not comprehensive, and encompasses the current scientific consensus. This consensus is the best current scientific explanation available. It is not absolute truth or beyond challenge but rather designed to give you a general context for the existence of your brain within a complex universal system which is open to ideas, debate and alternatives.

It is not essential to complete the remainder of today’s checklist, you can choose to leave day one here having taken in the key ideas from the videos you have watched. However, if you are interested in what the current accepted provenance of the amazing brain you possess is, its basic anatomical structure and wish to exercise it right now then please continue.

Read the explanations critically. Think over the implications of them. Engage in serious thought as to what you do and what you do not accept as reasonable. More importantly think about ‘why’ you accept or reject them in full, or in part.

The following delves into the issues that have been on the mind of humans for our entire history. Get ready to think critically about the explanations presented and about the reasonableness of them.
The Brain, The Universe & Russian Dolls

In the late 18th Century, German physician Franz Gall popularized the discipline of Phrenology (the notion that a relationship existed between a patient's personality and the shape of their skull). While we now understand this as pseudoscience, it was an important step towards the understanding that human behavior, thought, belief and emotion are physical functions of the human brain rather than occurrences within a separate non-physical ‘mind’ or granted by supernatural cause. Later, the French surgeon Paul Broca would, in the 19th Century, scientifically demonstrate that certain brain functions were attributable to localized areas of the brain. Broca's Area is named for him and is a region of the frontal lobe largely responsible for articulated language.

“If there were ever a phrenological science it would be the phrenology of convolutions [in the cortex], and not the phrenology of bumps [on the head]”
- Paul Broca, 1861

It was subsequently hoped for a time, that every function of human behavior would be identified as belonging to a specific neurological structure. However, modern neuroscience has shown that the human brain is a highly connected system where processes can take place across varied regions and in fact many take place in ways that are not yet well understood.

We cannot study a single neuron to understand the nature of a complex process such as a human thought, as that neuron exists along with 100 billion other neurons, all engaged in complex modes of chemical and electrical signalling between one another. The neuron exists in an environment - the brain.

Like the nesting dolls that began to be crafted 1,000 years ago in China during the Song Dynasty made of decreasing size to fit within one another (later popularized in Russia as Matryoshka Dolls then later still in the West as Russian Dolls) the brain, too, exists within an environment - the human body. In turn the body exists, along with 7 billion other humans, within the eco-system of Earth which circles just 1 of the 300 billion stars in the Milky Way and the Milky Way exists as just 1 of 100 billion galaxies in the universe. In a very real chemical sense the human brain is dependant on these layered environments with the subatomic particles that form it’s construction having been formed in stars before the Earth even existed.

The Earth is in a Universe

Written at the end of the 4th Century CE The Confessions of St. Augustine is the earliest known Western autobiography. It's author Aurelius Augustinus, the then Bishop of Hippo Regius (later to be canonized as Saint Augustine), asked of himself what existed before the Earth, answering that nothing existed at all. This answer would form the prevailing belief in Western society for another 1,200 years.

By the 17th Century speculative Cosmology emerged and within a Century cemented itself as a science. Two-hundred years later, radiometric dating is invented, and in 1953 geochemist Clair Cameron Patterson used samples of an asteroid that landed in Arizona

“The brain, as an object of research, presents a defiant challenge to its own ingenuity.”
William Feindel, 1975
around 50,000 years ago (the Canyon Diablo meteorite) to date the age of Earth at 4.54 billion years.

Edwin Hubble (for which the Hubble Telescope is named), in the 1920’s, observed that distant galaxies were moving away from one another and that they were doing so with increasing speed. This suggested that in the past the universe had been more compressed. This compression meant a smaller, hotter, denser universe than exists now. Formed from his Annus Mirabilis papers, Albert Einstein published his geometric theory of gravitation in 1916, popularly known as his theory of general relativity. When applied to the Hubble observations, a time is reached when the universe was perfectly compressed; where both the density and temperature of the universe was infinite, where the entirety of the universe was a singularity (a point of infinite gravitation). That time was 13.7 billion years ago.

This left a problem for the answer of Augustine. With the age of the Universe at 13.7 billion years and the age of the Earth at 4.54 billion years, 9.16 billion years of pre-Earth now required explanation.

At this earliest point, 13.7 billion years ago, some event caused the universe to depart singularity. Originally named the Primeval Atom Event it was pejoratively called the ‘Big Bang’ by astronomer Fred Hoyle, a name which stuck in the popular consciousness, despite no ‘bang’ or ‘explosion’ being encompassed within the theory - which only suggests sudden ‘expansion’. This departure from singularity meant the universe began to expand, cool and convert energy into nucleons (neutrons and protons).

Around 3 minutes after the event the universe had cooled enough to allow for nuclear fusion. Neutrons fused with protons to form Deuterium (an isotope of Hydrogen) which rapidly began to fuse again into the more stable Helium isotope Helium-4. However, 17 minutes after fusion began the universe had cooled too much for the process to continue resulting in a universe of 75% Hydrogen and 25% Helium (with some traces of other elements).

Over the next 9.16 billion years gravitational pressure would form stars from hydrogen, which in turn produced heavier elements within themselves (or via supernovae). One such star was our Sun. The massive amount of gas and dust that remained from the Sun’s formation would begin to orbit around it. The dust collided to form clumps of matter which via continued collision would eventually form the planets of our solar system. Matter closest to the Sun could only form as substances with high melting points (iron, nickel etc.) and become terrestrial, as Earth did 4.54 billion years ago.

“We’re made of star stuff”
- Carl Sagan, 1990
There is Life on Earth

Not all of the clumps of matter formed would end up as planets. Much of it was still spinning around the sun after the formation of the Earth. Studies of our Moon show that these clumps often collided with the Earth violently, although erosion over time has covered the craters on Earth, they still exist on the Moon.

Heavy molten iron sank to the middle of the newly forming Earth, to become it’s core, which the lighter material rose to the surface to form it’s crust. Around 4.3 billion years ago rain began to fall, followed by savage electrical storms. Then something amazing happened - around 4 billion years ago organic material began to appear. Lightning, it appears was the catalyst for the building blocks of life.

Consider the following classic experiment. It demonstrates how inorganic elements in the primordial Earth’s environment could have combined in the presence of lightning to form the building blocks of life.

Amino Acids
a recipe for life

The Miller-Urey Experiment simulates the hypothetical conditions of Earth before the existence of living organisms combine...

Around 3.5 billion years ago, these amino acids formed microorganisms, much resembling the bacteria that still exists today. These cells (prokaryotic) survived by soaking up organic molecules in the environment and reproduced asexually, by dividing themselves in two. By 2.7 billion years ago cells had evolved which no longer needed external molecules to survive, but instead converted the energy of sunlight into it’s own ingredients (photosynthesis). Two billion years ago cells appeared that could reproduce sexually, through the combination of two specialized sex cells, and by 1.7 billion years ago organisms are found that consist of more than one specialized cell.
The Complex Brain is in Humans

A billion years later these multicellular organisms, via evolution, had formed arthropods (simple ancestors to insects, spiders and crustaceans). Another 500 million years and the first mammals appear, with brains evolved similar in structure to arthropods but with the important addition of two structures: the neocerebellum and neocortex. In these early mammals these new structures were not particularly large in comparison to the brain stem, however when early primates emerge 440 million years later they are much, much larger. When, 200,000 years ago, humans begin to appear in Africa these structures have evolved so large that the original brain stem is almost completely hidden. These new, large structures allowed conscious thought, the ability to plan, self-awareness and the use of complex language.

The Human Brain is Made of Parts

The following graphic is a brief summary of the functional anatomy of the human brain.
The Parts are Made of Cells

The human brain is composed of approximately 10% neurons (around 100 billion) and 90% glial cells (around 1 trillion). Neurons send and receive electro-chemical signals to and from the brain and nervous system. Unlike most cells in the human body, neurons cannot renew after damage (with the exception of some neurons in the hippocampus). While there is a rich post-scientific history of the study of neurons until recently it was thought that glial cells did very little.

In fact, the name Glial comes from the Greek for ‘glue’ under the hypothesis that the cells did no more than bind neurons (hence the popular saying that we ‘only use 10% of our brains’). However, like the naming of Influenza (from the Italian ‘influence’ under the assumption that the influence of the stars caused the illness) this has proven to be incorrect.

The following is a graphical summary of how neurons actually function and communicate with one another:

1. **Dendrites**
   - accepts input messages from nearby neurons

2. **Soma**
   - processes the message which is sent as nerve impulse through the neuron

3. **Axon**
   - turns the processed message into the output required from the neuron

4. **Synapse**
   - transfers the message onto other neurons when neurotransmitters are released by the neuron

- Neurons are cells that make up 10% of the central nervous system.
- They are specialized cells that send signals around the body through an electrochemical process.

The human brain contains around 100 billion neurons.
Glial cells come in a number of types which serve different functions. Considering the serious research into Glia is a young endeavour, it is most likely we will discover they have many more functions than are summarized below. The most recent research suggests they have a chemical language all of their own, quite separate from that of neurons, although we are yet to understand it.

**Glia**

**What are they and what do they do?**

**Astrocyte (Astroglia)**

these star-shaped cells provide physical and nutritional support for neurons:

- clean up “debris”;
- transport nutrients to neurons;
- hold neurons in place;
- digest parts of dead neurons;
- regulate content of extracellular space

**Microglia**

like astrocytes, microglia digest parts of dead neurons

**Oligodendroglia**

these provide the insulation (myelin) to neurons in the central nervous system

**Satellite Cells**

provide physical support to neurons in the peripheral nervous system

**Schwann Cells**

provide the insulation (myelin) to neurons in the peripheral nervous system.

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**Ending Day One**

The most important idea to take away from today is that your brain does not exist in isolation. It exists inside your body, which exists inside an environment. How you treat your body and interact with your environment will then have a very direct impact on the functioning of your brain. Starting tomorrow we will begin to outline the actions you can take to optimize your brainpower.