The Whole

Guide to the Mind, Body, and Brain

by Henry Daum

"Without directly knowing the whole, without completely understanding the whole, one is incapable of destroying suffering."

—The Buddha, SN 35.26

Topics: artificial intelligence, behavior, biology, the body, the brain, Buddhism, cognition, cognitive science, consciousness, evolution, feelings, freedom, health, linguistics, the mind, money, neuroscience, philosophy, psychology, relationships, reproduction, science, the self, the senses, society, survival

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With great gratitude to my teachers and parents.

"Let me speak. No, there is too much. Let me sum up."
—Iñigo Montoya

Preface: The Whole

The world is changing from a dense forest of ancient scripts to a concrete jungle ruled by artificial intelligence. With *The Whole*, you will be empowered to think, act, and reflect in ways beneficial for yourself and others. You will be able to answer some of life's deepest questions and find resilience in the most difficult of times. In return, meaning, purpose, and love will find you.

The Whole aims to reconcile and semi-simplify gems of wisdom from both ancient and modern traditions. There have been two versions of this writing. The original, 2021 version was based on the Theravāda branch of Buddhism, specifically the *Abhidhammattha Saṅgaha*, an 11th-century text written in ancient Pāli (the language the Buddha spoke about 2,500 years ago). The present 2025 version is based on cognitive science, which is an interdisciplinary academic field with five areas: neuroscience, psychology, philosophy, linguistics, and artificial intelligence. Cognitive science is about 60 years old. Thus, the information in this guide is both old and new, and spans from religion all the

way to the physical sciences. Overall, I have spent countless hours of study over several years to complete *The Whole*.

Although I would love it to be, *The Whole* is not entirely comprehensive due to its concise and compact style. Rather than a magical, all-knowing tome, it is more like a map for navigating the wilderness of the mind, and maps do not show every shrub. Moreover, a guide can show you the lay of the land, but you must take the journey yourself. At the end of the day, your journey can be practically anything you want it to be. My hope is that this book helps the reader in whatever way it can.

The notes at the end of the book are important—they will help clarify things too. Also, I have added a visual map of the nervous system after those. Finally, there is a Spanish translation of *The Whole* available on my website (henrydaum.site).

Thank you for reading,
Henry Daum

Everything has pros and cons.

Introduction

The whole can be understood as comprising:

I) Consciousness
II) Mental Factors
III) The Cognitive Process
IV) Materiality
V) Conditionality
VI) Society
VII) Freedom

The whole is impermanent; subject to change.

Mental and physical phenomena make up the whole. Through introspection, mental phenomena can be observed directly, without the mediation of concepts, but through science, physical phenomena can be measured and conceptualized.

Consciousness, mental factors, and materiality (parts I, II, and IV) can be seen as the fragments, bedrock, or raw substrate of mental-physical experience and things. The cognitive process, conditionality, and society (parts III, V,

and VI) can be seen to collectively make up the basics of interaction between these various fragments, as a mode for understanding their limitations and strengths, as well as their impermanence.

If consciousness, mental factors, and materiality (parts I, II, and IV) are like the parts, then the cognitive process, conditionality, and society (parts III, V, and VI) are how the parts fit together, forming a holistic machine called ‘the whole.’

Part I: Consciousness

Consciousness is the bare knowing of an object.

Consciousness is of six kinds:

i) Wholesome consciousness, and
ii) Unwholesome consciousness
iii) Social consciousness
iv) Sensory consciousness
v) Somatic consciousness
vi) Subliminal consciousness

Wholesome consciousness leads to the existence of the whole, while unwholesome consciousness leads to the non-existence of the whole.

Social consciousness is a shared understanding held by a group of people.

Sensory consciousness is tied to the five senses—vision, hearing, olfaction, taste, and touch.

Somatic consciousness is the experience of feelings.

Subliminal consciousness has to do with reflexes, and also occurs during sleep.

This is the explanation of consciousness as part of the whole.

Part II: Mental Factors

Mental factors are the specialized cognition in the knowing of an object.

The relationship between consciousness and mental factors should be understood as that between a king and his retinue. The king is like the consciousness, which knows an object, while the servants are like the mental factors, which delimit and inspect the object.

The mind is made of mental factors.

Mental factors are of five kinds:

i) Wholesome mental factors, and
ii) Unwholesome mental factors
iii) Emotional mental factors
iv) Social mental factors
v) Miscellaneous mental factors

The wholesome mental factors lead to life, whereas the unwholesome mental factors lead to death, and neutral mental factors do neither. However, life and death are not guaranteed by mental factors.

The emotional, social, and miscellaneous mental factors can be wholesome, unwholesome, or neutral, depending on context. For example, it is not wholesome to trust an enemy.

The emotional mental factors are faith, mindfulness, ethics, generosity, creativity, mental balance, tranquility, love, kindness, and wisdom (these are ethical); as well as greed, hatred, delusion, confusion, envy, miserliness, regret, conceit, agitation, and laziness (these are unethical); plus fear, anxiety, sadness, and desire (neither ethical nor unethical).

The social mental factors are shame, sociability, empathy, sexuality, and humor.

The miscellaneous mental factors are perception, attention, intention, forgetting, concentration, energy, feeling, and memory. (There are three types of memory: working memory, short-term memory, and long-term memory.)

This is the explanation of mental factors as part of the whole.

Part III: The Cognitive Process

The cognitive process is the orderly receiving of and reaction to an object.

The cognitive process happens in three discrete stages:

i) Sensory input
ii) Cognition
iii) Behavioral output

The senses receive sensory materiality (sights, sounds, smells, tastes, and touches) and produce sensory information for the brain. Sensory information is used by the brain to generate new concepts of what to do. This includes predictions of the future and instructions for muscular and visceral reactions.

The sensory input stage involves neural transduction, which is the process of turning sensory materiality into neural signals. The cognition stage involves manipulating these neural signals, and occurs within the brain hidden within the skull. The behavioral output stage transforms neural signals into muscle movement and visceral organ control.

Cognition has two parts:

i) “The Thinker”—produces predictions for the future based on patterns of sensory input.

ii) “The Doer”—produces behavioral outputs based on sensory input and the Thinker’s thoughts.

When sensory information is received from the senses, behavioral reactions occur in two distinct generations, aided by reflexes. First, the Doer produces an initial response which is fast but imprecise—this speed is important for survival. Second, the Doer produces a delayed response, after the Thinker has provided it some contextual, predictive information; this delayed response is slow but precise. The classic example is seeing a snake and jumping back, only to realize it is a stick and continue forward.

The senses are continually impinged upon, and the cognitive process continually occurs at a rate dependent on the amount of energy available for processing. Each iteration of the cognitive process occurs extremely rapidly, but the learning part of it is relatively slow.

The Thinker learns by observing the flow of time; comparing its predictions to reality after some time has passed. Whether or not the predictions happened to be correct is used to improve subsequent predictions. The Doer learns by doing actions and then receiving feedback based on its actions. Feedback comes from the viscera in the form of feelings and from the Thinker in the form of thoughts;

subsequent actions are improved to produce better homeostatic feelings and more positive thoughts.

This is the explanation of the cognitive process as part of the whole.

Part IV: Materiality

Materiality is the simple physical basis for cognition.

The relationship between consciousness, mental factors, and materiality should be understood as that between a king and his retinue, and the chariot on which they arrive. The chariot they arrive on is like materiality, which forms the physical support for cognition.

All materiality has a location, and materiality is of four kinds:

i) Wholesome materiality
ii) Unwholesome materiality
iii) Sensory materiality
iv) Biological materiality

Wholesome materiality aids in life and survival, while unwholesome materiality is conducive to illness and death, and neutral materiality does neither.

Wholesome materiality includes the requisites of living: food, water, shelter, clothing, and medicine, each in the right amounts. Unwholesome materiality includes poisons,

weapons, pathogens, and lethal temperatures used against oneself or a loved one. This and all other materiality can be wholesome, unwholesome, or neutral, depending on context.

This is wholesome and unwholesome materiality.

Sensory materiality is of five kinds:

i) Sights
ii) Sounds
iii) Smells
iv) Tastes
v) Touches

Sights are photons, sounds are sound waves, smells are olfactory chemicals, tastes are gustatory chemicals, and touches are force, temperature, and tissue damage.

According to the laws of physics, objects are sources of sensory materiality. For example, oranges produce a sour taste since they contain certain gustatory chemicals.

This is sensory materiality.

Biological materiality essentially makes up the body, and is of five kinds:

i) The nervous system
ii) Senses
iii) Viscera
iv) Skeleton

v) Muscles

The nervous system consists of the central and peripheral nervous systems. The central nervous system is the brain and spinal cord, and the brain is divided into three major areas: the lower, middle, and higher brain. The Thinker is located in the higher brain, while the Doer is located in the middle brain, and reflexes are located in the rest of the nervous system. The peripheral nervous system has two parts: the somatic and autonomic nervous systems.

The senses are of five kinds:

i) Eyes
ii) Ears
iii) Nose
iv) Tongue
v) Skin and tissue

The viscera is of five kinds:

i) The heart (and vascular system)
ii) The lungs (and respiratory system)
iii) The guts (and digestive system)
iv) The reproductive organs (and reproductive system)
v) The lymphatic organs (and immune system)

The skeleton is a strong and mobile frame, which all other biological materiality is directly or indirectly attached to.

The muscles are of three kinds:

i) Skeletal muscles

ii) Smooth muscles
iii) Cardiac muscles

Skeletal muscles attach directly to the skeleton, smooth muscles line the viscera, and cardiac muscles are specific to the heart. Skeletal muscles are connected to the somatic nervous system, and smooth and cardiac muscles are connected to the autonomic nervous system.

Biological materiality consists of tiny, interconnected living cells which depend on energy. Single cells are unconscious but possess a recondite intelligence. The nervous system has cells called neurons that can send signals and perform basic computations.

This is biological materiality.

The absence of materiality is empty space.

This is the explanation of materiality as part of the whole.

Sub-Part IV: Movement

Movement is the motion of materiality.

Movement can be understood as the chariot's motion, with the king and his retinue on it.

The motion of materiality obeys Newton's laws of motion.

Movement is of three kinds:

i) Wholesome movement
ii) Unwholesome movement
iii) Neutral movement

Wholesome movement is movement towards wholesome materiality, or away from unwholesome materiality.

Unwholesome movement is movement away from wholesome materiality, or towards unwholesome materiality.

Neutral movement is no movement relative to wholesome or unwholesome materiality.

This is wholesome, unwholesome, and neutral movement.

Movement can be created by muscles at the cost of energy. Movements from skeletal muscles create behaviors like moving, talking, and interacting.

This is the explanation of movement as sub-part of the whole.

Part V: Conditionality

Conditionality is the complex yet lawful inter-fabrication of consciousness, mental factors, and materiality.

When the requisites of living come into direct contact with the lungs and guts, the result is that energy is transferred to the blood and circulated throughout the body by the heart. Energy is required by all living cells to function, including neurons. Without sufficient energy, the body slows down and eventually dies.

The cognitive process is in charge of coordinating survival efforts, which put the requisites of living into direct contact with the lungs and guts. These survival behaviors include breathing air, eating food, and drinking water, as well as subliminal reflexes like pumping the heart, digestion, and balance. Subliminal reflexes do not use the cognitive process, but rather neural circuits found in the lower brain, spinal cord, and peripheral nervous system. (Breathing is under both subliminal and conscious control.)

As a by-product of healthy functioning, the body's cells produce waste products which are then transferred to the

blood. After being transferred to the blood, CO_2 is transferred to the lungs, and other waste products become urine and feces. The survival behaviors that expel this unwholesome materiality from the body include breathing out, urination, and defecation.

Based on the body's energy levels and cell health, the peripheral nervous system produces a feeling: pleasant, painful, or neutral. A pleasant feeling corresponds to positive changes in homeostasis, a painful feeling corresponds to negative changes, and a neutral feeling is no change. Homeostatic feelings are used by the cognitive process, specifically the Doer, to train survival behaviors directly through reinforcement.

The body's cells need a specific temperature to function properly, and hence clothing and shelter are requisites of living as well. There are many behaviors associated with staying at the right temperature, including shivering. Using the body's energy, the immune system protects the body from outside attack. However, if things get out of hand, then the immune system will create feelings of sickness that stimulate restorative behaviors, like taking medicine.

Feelings can be homeostatic or emotional. Homeostatic feelings, like hunger and thirst, come directly from the status of the internal viscera. Emotional feelings, like feeling hot when angry, result from visceral reactions that come from the cognitive process. In the short-term, all

feelings produce reactions, but in the long-term, feelings are used as feedback for learning.

A number of feelings serve the survival of the species more than the survival of oneself. In order to ensure the survival of the species, reproductive organs create sexual feelings that guide reproductive behaviors. For the purpose of reproduction, there are two main sexes: male and female, with differing reproductive organs. With the right conditions, there can be the birth of a new person. People develop and age over years. Eventually, every person dies.

This is the explanation of conditionality as part of the whole.

Part VI: Society

Society is what emerges from the interactions between people.

While the Doer is rewarded for maintaining homeostasis, the Thinker is rewarded for making correct predictions of the future based on somato-sensory information. Predictability is sought after by the Thinker, and so it tries to influence the Doer (via a top-down pathway) to make its predictions come true. As a result, the Thinker can inhibit certain actions from occurring and cause others to occur. This creates and molds complex behavior.

With the aid of working memory and attention, the Thinker makes predictions based on extended patterns of information filtered based on context. Predictions are held in short-term memory, and then compared to reality after some time. Then, learning occurs based on any differences between prediction and reality, which affects long-term memory. To do this, the Thinker created language.

Language developed as a concept used by the Thinker to represent patterns of somato-sensory information. In other

words, language is based on a prediction of the future, depending on the past and present. For instance, when given a string of words (which correspond to spoken sounds and written symbols), the Thinker can predict the next one in the sequence. Sequences of letters are words and sequences of words are sentences, and so on. This is how the Thinker learns.

Language is used to represent a real sequence of events. It does this using nouns, which represent the objects (or people and living things) out in the world, and verbs, which represent their actions, or movement. Verbs have past, present, and future tenses which organize time.

When language reaches the Doer as an input, the Doer imparts a sense of emotional significance. From there, language can be expressed via action—communication. Verbal communication is the generation of speech using the vocal cords and mouth. When heard by another person, the speech can be interpreted as a signal to approach or withdraw, and in what way. Through communication, people can reach a shared understanding, which is the basis of culture and society.

Critical concepts are about resources needed for survival (requisites of living) and who they belong to. Boundaries in relationships, as well as economic transactions, all depend on a shared understanding of who owns what. Linguistically, this is done using possessive parts of speech (*mine,*

yours, ours, etc.). Without a shared understanding of possession, relationships dissolve.

A transaction is when two people exchange their possessions, or services. An economic transaction can occur after there is a shared understanding of price. The price of a good (materiality) or service (behavior) depends on supply (the actual physical quantity available) and demand (the homeostatic or other need it fulfills). The economy consists of transactions which are based on shared understandings of price and money.

Sometimes, the shared understandings are not about immediate value, but about something that will happen in the future. This is the basis of written and unwritten laws in society, where something *will happen* if somebody breaks the law. These and other promises are possible using the Thinker and memory. (This is also the origin of loans.)

Finally, there is the self. The self is a concept that comes from the inter-fabrication of the Doer and Thinker. Every person has a self; it is a point of view and unique perspective that comes with inhabiting and owning a particular body and mind. Since it is a concept, it is possible to explain oneself to others. This is the key to empathy.

People have an almost instinctual occurrence of asking themselves (and each other) who they are, what their purpose is, and how they feel. However they should respond, honestly or dishonestly, implies their future

behavior. In this way, the Thinker conditions the Doer, which can turn thoughts into actions. Similarly, people learn from others by asking for and/or receiving feedback (about themselves) from others.

This is the explanation of society as part of the whole.

Sub-Part VI: Evolution

Evolution has three steps:

i) Selection
ii) Reproduction
iii) Variation

Based on wholesomeness, some individuals in a population are able to reproduce, while the rest die without reproducing. Then, the environment is repopulated with descendants of the selected ones—this is reproduction. To ensure variation, the individuals in the new population are born with some unique and random changes. This cycle repeats. With each generation, the population improves, through slight and incremental changes, at meeting the criteria for selection, which is wholesomeness. (In this case, wholesome can also mean attractive.)

Since evolution changes the nervous system to be more wholesome, evolution can be considered another form of

learning that occurs over generations. Evolution shapes the instincts and reflexes that are set at birth; It is not the kind of learning that comes from direct experience.

This is the explanation of evolution as sub-part of the whole.

Part VII: Freedom

Freedom is the temporary destruction of suffering.

Learning transforms unwholesome mental factors into wholesome mental factors. Ignorance transforms wholesome mental factors into unwholesome mental factors.

Order transforms unwholesome materiality into wholesome materiality. Chaos transforms wholesome materiality into unwholesome materiality.

Learning and order create freedom, while ignorance and chaos create suffering. These four processes are impermanent, so suffering and freedom are temporary.

This is the explanation of freedom as part of the whole.

Everything is a world unto itself.

Notes

These notes are not as rigorous as the above writing, but they fill in areas of understanding that may have been missed.

The Whole refers to this book and its concepts, while "the whole" refers to the actual thing itself with the seven parts.

The Whole is meant to be an extremely pragmatic and practical framework. It is more deterministic than probabilistic, and more descriptive than prescriptive.

The Whole is primarily about humans, but parts of it also apply directly to other living things, and especially to computers with artificial intelligence.

Suggested reading/sources:

- *The Body Keeps The Score* by Bessel Van Der Kolk
- *Feeling and Knowing* by Antonio Damasio
- *On The Origin of Species* by Charles Darwin

- *Abhidhammattha-Saṇgaha* by Ācariya Anuruddha, translated by Bhikkhu Bodhi
- *The Path of Purification (Visuddhimagga)* by Buddhaghosa, translated by Bhikkhu Ñāṇamoli
- *Neural Networks and Deep Learning* by Michael Nielsen, available at: neuralnetworksanddeeplearning.com

Part I: Consciousness

1. The *Abhidhamma* states that consciousness can only know one object at a time.
2. When the mental factors are predominantly wholesome, the consciousness is also wholesome. Conversely, when the mental factors are predominantly unwholesome, the consciousness is unwholesome.

Part II: Mental Factors

1. Every mental factor has a specific function. For example, the function of concentration is staying with the same object for a long time, while distraction is switching rapidly from object to object.
2. Descriptions of many mental factors can be found in *The Path of Purification (Visuddhimagga)*, in the chapter on the aggregates.
3. The actual *Abhidhamma* has 52 mental factors.
4. A few mental factors, like love and self-sacrifice, are defined in terms of other people benefitting even if

oneself is not. This has roots in evolution and the fact that people can survive better in community.

5. Mental factors are interconnected and have a strength. For instance, ethical mental factors are usually strong when unethical mental factors are weak, and vice-versa. Through learning, mental factors can change their connections and strength.
6. Some people believe that ethical mental factors are always wholesome, and lead to happiness; and that conversely, unethical mental factors are always unwholesome, and lead to suffering. However, this framework is pragmatic and recognizes that unethical mental factors have their uses, or else they would not exist.
7. In the same vein, there are many mental factors that exist which are not on this list.
8. Mental factors are comparable to artificial neurons in AI. More accurately, groups of artificial neurons.
9. Short-term and long-term memory are used in both the Doer and Thinker, but only the Thinker has access to working memory as well.

Part III: The Cognitive Process

1. Sensory neurons are the neurons for the sensory input stage of the cognitive process, interneurons are for the cognition stage, and motor neurons are for the behavioral output stage.

2. Concepts are associated with neural signals (or brain activity), which break down biologically to neurotransmitters and action potentials.
3. The difference between an initial and a delayed reaction by the Doer is several microseconds. Source: *The Body Keeps The Score*. In other words, it is extremely rapid.
4. The Doer and Thinker also receive information about the position of the limbs and muscles via muscle tendon stretch detector neurons.
5. Learning is comparable to backpropagation, or gradient descent, in AI.
6. Classical and operant conditioning are based in the Thinker and Doer.
7. The human brain has roughly 80 billion neurons.
8. Sensory inputs are somewhat random, because not everything in the universe can be predicted. For example: quantum mechanics.
9. It's important to note that the cognition stage of the cognitive process is completed by mental factors based in neural circuits in the brain. However, the sensory input stage, reflexes, and behavioral output stage also use neurons.
10. Positive and negative feedback are equally useful for learning, even though the former is pleasant and the latter unpleasant.

<u>Part IV: Materiality</u>

1. The absence of materiality is empty space.

2. Most kinds of materiality have mass, which can be measured using scientific instruments.
3. Tools can be considered an extension of one's abilities. Types of technology include transportation (cars and planes), communication (phones and satellites), measurement (cameras and fMRI machines), survival (fire), building (houses and skyscrapers), warfare (weapons), and destruction (bombs).
4. Materiality can be used to store information. For example, information technology (books and the internet). The "extended mind theory" is that these things serve as an extension of one's mind, like how sticky notes augment one's memory. Some people go as far as to say these can function as a "second brain."
5. Vision is based in photoreceptors in the retina; hearing is based in hair cells in the inner ear's cochlea; olfaction is based in olfactory receptor neurons in the olfactory epithelium; taste is based in taste receptor cells in taste buds; touch is based in mechanoreceptors, thermoreceptors, and nociceptors found in the skin and tissue.
6. Another sense is balance, aided by the vestibular organs found in the inner ears, which are sensitive to acceleration and gravity.
7. Neurons have three parts: dendrites, a cell body, and an axon. The place where two neurons connect is a synapse. Action potentials travel from dendrites, through the cell body, and down the axon, and are technically electricity. Neurotransmitters travel across the synapse.

8. Synapses can be excitatory or inhibitory, as well as short-acting or long-acting.
9. In addition to communicating via sights and sounds, human bodies can also create smells—pheromones—which are released by apocrine glands in the skin.
10. Biological materiality can be wholesome or unwholesome, depending on whether it aids in survival and reproduction. For example, a tumour is unwholesome.
11. Materiality may undergo numerous changes before being received as sensory materiality. For example, signals within computers undergo numerous changes before becoming visible on the screen.
12. An environment is made up of many smaller objects.
13. Once again, skeletal muscles are attached to the skeleton and create behavior like talking, moving, and interacting. Smooth muscles line the viscera and help with visceral control. For example, chewing an orange takes skeletal muscles, but *digesting* the orange takes smooth muscles. This is a subtle point.
14. The nervous system also has supporting cells called glial cells.
15. The Thinker is based in the cerebral cortex and hippocampus. The Doer is based in the limbic system basal ganglia, and pituitary gland. The reflexes are based in the brain stem, cerebellum, spinal cord, and peripheral nervous system. These are rough estimates—the actual nervous system is more complicated.

<u>Sub-Part IV: Movement</u>

1. The motion of materiality follows Newton's Laws of Motion.
2. Movement can be measured in terms of velocity and acceleration.
3. Sights move at the speed of light, and sounds move at the speed of sound.
4. Action potentials move at 80-120 m/s for myelinated axons, and 0.5-10 m/s for unmyelinated axons. (Myelin is an insulating layer that forms around axons to speed up action potentials.) This is *kind of* like the "speed of thought."
5. Muscles produce a force, which, in the case of skeletal muscles, moves the body via the tendons which attach to the skeleton.
6. Movement is relative and can occur intentionally or unintentionally. For example, a person can stand still but a bullet speeding towards them has an unwholesome movement (for them).

Part V: Conditionality

1. The body can store energy for later use, in fat.
2. Short-term feelings are somewhat hardwired and the result of evolution. For example, the startle response developed and it aided in survival, and so was preserved via evolution.
3. Muscle and limb sensing is known as proprioception; sensory materiality sensing as exteroception; and feeling feelings as interoception.
4. However, there is some overlap between "touches" and "feelings" in this model. Technically speaking, touches

refers to the sensations caused by objects outside of one's body, and feelings are the sensations caused by stuff inside of one's body. However, touches and feelings are so similar in meaning and usage that it's hard to tell, and the terms are nearly interchangeable in everyday usage.

5. The brain actually has no touch—or pain—receptors inside it.
6. Impulses can occur within a second, but learning can take up to two weeks to fully show up. (Very rough estimate.)
7. Drugs are infamous for providing short-term pleasure at the cost of long-term suffering and addiction. This has a lot to do with how drugs create a tolerance within the body.
8. Drugs mimic neurotransmitters and other biochemicals found in the brain and body. They can enter into the bloodstream through similar pathways as eating, breathing (smoking), and drinking.
9. Many healthy activities trade short-term pain for long-term gain. For example, studying for a test, or saving money.
10. Feelings almost always have a location in the body.
11. Homeostatic feelings include thirst, hunger, cold, sickness, and so on.
12. Visceral reactions often accompany mental factors like anger, sadness, and fear. When this happens, the resulting feeling is called an emotional feeling. Emotional feelings are triggered by mental factors.

13. Other people are a super important source of emotional feelings. However, these feelings do not always come from bodily touch. Rather, sensory inputs activate mental factors (like empathy) that then affect the internal viscera, creating emotional feelings. This happens so quickly it's often taken for granted.
14. Emotional feelings are in contrast to homeostatic feelings: thirst, hunger, sickness, sleepiness, and so on. The source of emotional feelings is primarily the mind, whereas the source of homeostatic feelings is primarily the body. However, the actual feelings themselves can be hard to distinguish in experience.
15. Empathy is probably based in the "mirror neurons" of the cortex.
16. Sleep is another survival behavior based around saving energy.
17. Babies start off with a reduced version of the whole, but eventually develop the full thing. This happens in a specific order that is very complicated, but roughly speaking for the brain the order is reflexes → Doer → Thinker. The Thinker is the last thing developed, and becomes fully developed at around age 25.
18. Sex is determined at conception.
19. Many physical and mental traits are sexually dimorphic, which means they vary depending on the sex. This includes bone structure, muscle density, fat storage, hair growth, flexibility, certain brain areas, dominance and submissiveness, and overall body/face appearance (and reproductive organs).

20. People also develop sexually dimorphic *behaviors*, with males and females behaving differently.
21. The reproductive organs produce different hormones depending on the sex. Testosterone for male, estrogen for female.
22. Hormones are bloodborne chemicals that circulate throughout the viscera and create various changes.
23. Hormones are also released by the pituitary gland in the brain (part of the Doer). They enter the bloodstream and then affect the internal viscera. This way of signaling is in opposition to neural signaling through the spinal cord and PNS. It is slower.
24. It should be noted that there is much more in human biology that is focused on the survival of the species, than reproduction alone. For example, love and altruism.

Part VI: Society

1. Attention is the mental factor responsible for deciding what information is important to pay attention to under different contexts, circumstances, and perspectives.
2. A group is three or more people. So long as they can communicate, the group will have a culture with cultural rules.
3. Every group has a name, just like how every individual has a name that others refer to them as.
4. The Thinker is comparable to AI language models; the Doer is comparable to AI reinforcement learning models.

5. Money also reacts to supply and demand. The more money there is, the lesser its value; this is inflation.
6. In addition to goods and services, money can also be exchanged for financial assets, like stocks and bonds.
7. For many people, the self is probably their most important concept.
8. As the term is used, "person" means someone with a body and mind.
9. With self-inquiry and self-reflection, the Thinker gives the Doer thoughtful feedback about its actions. So in the end, the Doer is given feedback from both the viscera and the Thinker. This is why they sometimes disagree.
10. From the Thinker, the Doer is given short-term thoughts that function as instructions, and long-term thoughts (feedback) that teach it how to follow the instructions better.
11. Reflections/feedback can be received from other people, with a similar result as self-provided feedback.
12. The Thinker teaches itself, but the Doer is taught by the Thinker and viscera.

Sub-Part VI: Evolution

1. Evolution is an extremely long-term process, which takes numerous generations before any observable change takes place. This distinguishes it from other kinds of learning, which can be observed in a single person's lifetime.
2. Evolution explains why many animals share parts of the whole in common with humans, such as a motor

system, nervous system, and sensory system: all species descended from a common ancestor.

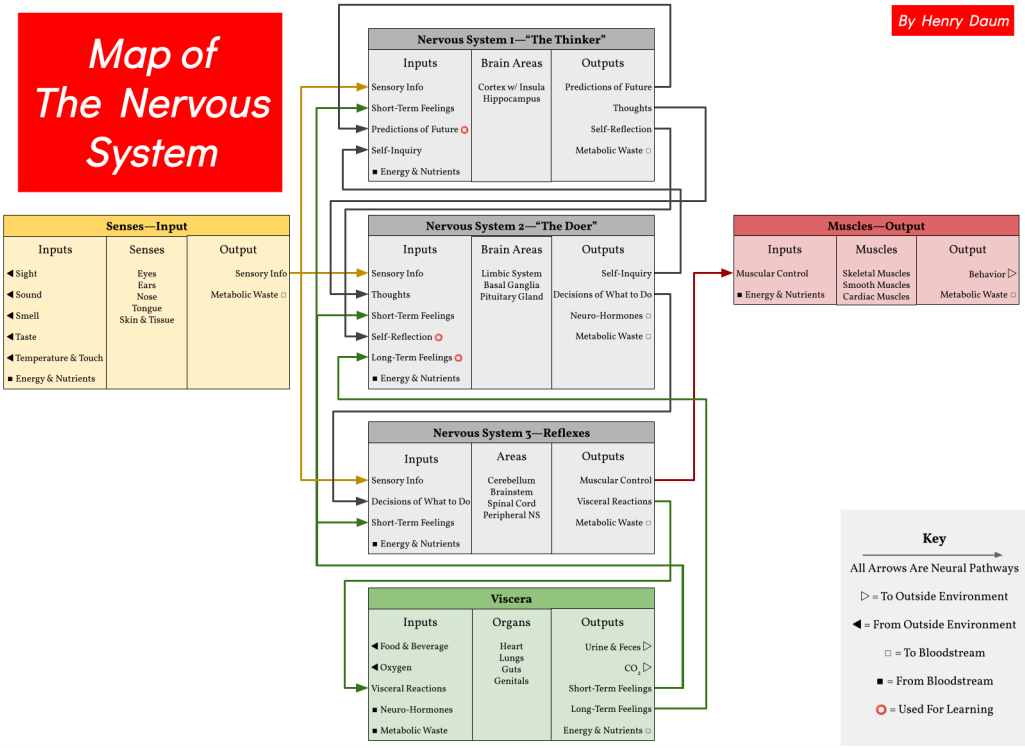
3. Evolution applies to many things, including (but not limited to) people, animals, plants, cells, technologies, and even self-concepts and ideas through ‘artificial selection.’
4. For living things, what becomes copied with reproduction is DNA, and DNA is also what is subjected to variation. DNA is found within the nucleus of most cells, and guides the growth and function of these cells, and thus the growth and function of the entire organism.
5. Having two sexes increases genetic diversity through genetic recombination. Almost all animals have sexual reproduction, not asexual reproduction (cloning).
6. Natural resources are generally limited. This is a major driving force in evolution, as well as capitalism. Scarcity leads to competition.
7. Evolution works because there are always more individuals born than the environment can support. Brutal, but true.
8. "Sexual selection" refers to the evolutionary prioritization of traits like attractiveness that enhance reproductive success, even if they do not aid survival. A classic example is the male peacock’s feathers—eye-catching and mesmerizing, but also cumbersome.
9. In terms of evolution, no change at all can still be wholesome and beneficial. This is why some creatures, like horseshoe crabs, haven’t evolved in millions of years.

Part VII: Freedom

1. Learning and ignorance can be a cycle, as can order and chaos.
2. The “Inevitability Hypothesis” is that suffering follows happiness and happiness follows suffering. This is a hypothesis, which means it is not always true. But it is almost always true. Importantly, the Inevitability Hypothesis doesn’t specify how much time it will take, either.
3. Learning can stop working when feelings are too subtle or too overwhelming. At this point, learning can turn into ignorance.
4. The recursivity associated with the whole can lead to it having a fractal appearance.

There is always a solution, except when there's not.

Map of the Nervous System



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