AL KITAB
The Renaissance Project

Chapter 13

The Mind

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The Mind

It is the most fascinating and marvelous entity known to man; the human brain is what makes us special. It is home to our thoughts and mind, and is the organ that is responsible for our perceptions and understanding of the world around us. Yet ironically, we know very little of it.

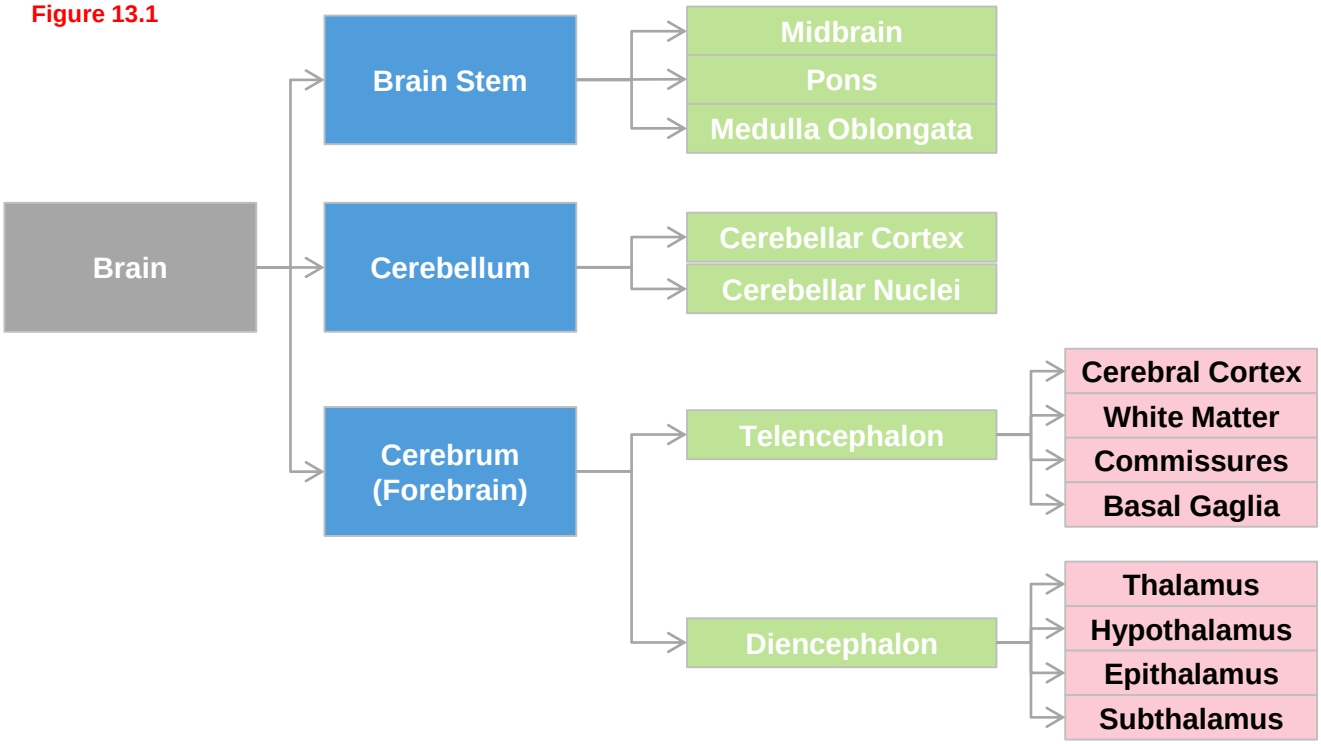
Our ignorance of the human brain is nothing new. For thousands of years, people did not know what it was responsible for. From ancient Egypt to Aristotle, consciousness was said to reside in the heart, not the brain(1). Even as people began to move upwards and speculate that consciousness resided somewhere in the head, the brain tissue was often the last place to look(2). It was not until Thomas Willis (17th century), who not only suggested that the brain itself was the locos of the mind, but that its different parts give rise to specific functions, did the idea of the brain being responsible for thought became appealing(1).

It would take centuries of research to gather widespread acceptance of this idea, and though the last century has seen giant leaps in our understanding of the brain, there are many questions that remain unanswered.

In the following chapter, we will take a brief tour through the mystery that is the human brain. More specifically, we will focus on identifying which parts of the brain are responsible for analyzing, judging and making decisions and compare this to Islamic teachings. Does the Quran identify the region of the human brain that is responsible for higher cognitive thinking?

The human brain is a complex organ that can be divided into three different parts, each part divided into sub parts and so on as seen in figure 13.1

Figure 13.1



Notes (1): James Shreeve. *Beyond the Brain* (National Geographic Magazine)

(2): Though it was **Alcmaeon of Croton** who was first to identify the brain region as the center of the mind, it was Gallen's work (in the 2nd Century AD) which gained widespread approval. However, Gallen had attributed cognition to the brain's fluid-filled ventricles / cavities rather than the brain itself; a proposal that wasn't amended until the 17th century

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The first part is called the brain stem which controls the basic physical actions necessary for survival such as cardiac and respiratory functions. The second part is the Cerebellum which coordinates voluntary movement and complex motor functions such as walking. The third part is the Cerebrum (forebrain), which is what most people think about when they envision the brain.

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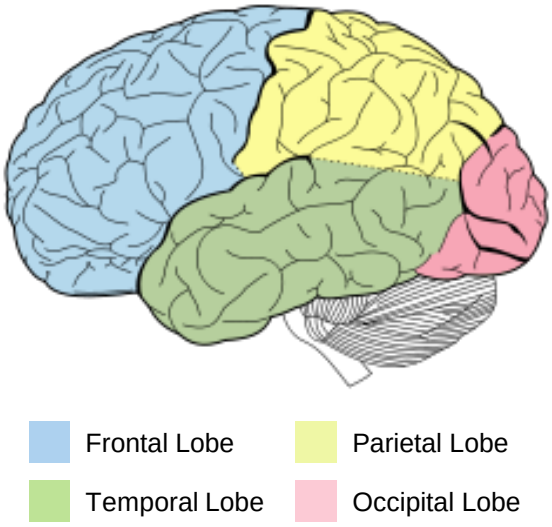
The Cerebrum (which I will call the brain going forward and is the subject of this chapter) is further divided into different parts and sub parts, the most important of which is arguably the cerebral cortex. It is the outermost brain layer that looks like a squishy pink walnut. It makes up 76% of our entire brain mass and is home to ~75% of all neural connections(3). Furthermore, it is responsible for all our higher functions such as reason, creative thinking, and language. In other words, our cerebral cortex is what makes us unique as humans.

The cerebral cortex can be anatomically divided into four main parts (4) as seen in figure 13.2, the first of which is the Occipital Lobe which is located at the back of the head. The second part is the Temporal Lobe which forms the lateral part of the brain. The third part is the Parietal Lobe located in the top middle of the skull. The fourth part is the **Frontal Lobe** which is located at the front of the head.

Left Brain? Right Brain? – The Science

Our brain can be divided into two hemispheres, left and right. In most people, the former is primarily responsible (dominant) for processing language, among other things, while the latter is primarily responsible for spatial cognition and emotions.

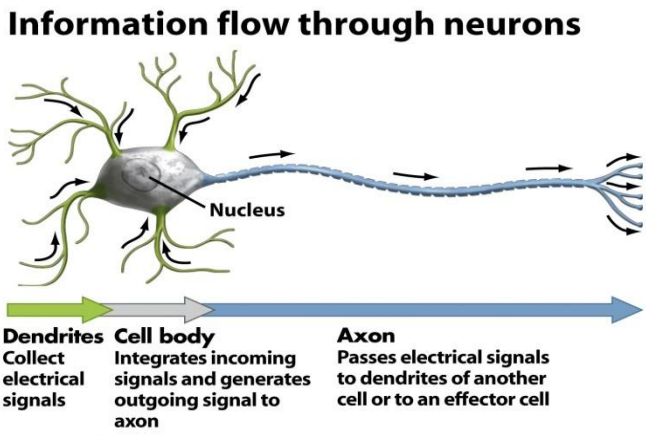
Figure 13.2



Did you know?

"Information processed by the brain is nothing more than electricity passing through neuron after neuron, pausing only to be converted into chemical energy as it leaps through synapses".

Figure 13.3



Neurons – The Science

The most fundamental unit of the brain is called the neuron or nerve cell. A human brain could contain up to 100 billion neurons! Each neuron is linked to millions of others. There are literally trillion of connections in the brain making it the most complicated object in the world.

Each part is responsible for various human functions, but identifying these functions is difficult due to the complexity of the human brain and the millions of linkages that exist within its network. Faced with such a difficulty, scientists have adopted several experimental techniques to find out what each part is responsible for, the most frequently used of which is observing people with brain damage (Lesions) (5).

Notes (3): National Geographic. *Your Brain, a User's Guide* (National Geographic Society 2012)
(4): There are 6 parts usually cited. In addition to the four mentioned, the insula and the limbic system are sometimes cited.
(5): Lesions could refer to damage caused by trauma, tumors, infections, toxic and metabolic disorders, degenerative and demyelinating diseases, neuromuscular and vascular disorders, congenital malformations and perinatal disorders.

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The concept is simple; by observing several people with damage to a particular part of the brain, we can identify which function that part of the brain is responsible for. If damage to a particular part of the brain seems to impede a particular function in test subjects, then that part of the brain must be partially or fully responsible for that function.

Most of what we know about the brain comes from such experiments. Recently however, the use of technologies such as functional brain imaging (see figure 13.3) has provided further evidence to our current understanding. Functional brain imaging technology literally detects which part of the brain is active during an activity or function. By observing which parts of the brain are active during particular functions, we can determine the parts responsible for that function.

Brain imaging technologies coupled with brain damage experiments have helped neurologist come to a better understanding of the roles of the different parts of the human brain and how these parts work together(6). For example, the occipital lobe is a region that serves various functions, the most notable of which is eye-sight. Its visual cortex allows us to interpret, see, and perceive the world around us. Similarly, the Frontal Lobe, which is probably the most interesting part of the Cerebral Cortex, is responsible for many cognitive functions. On its role, Stephen Waxman, the author of Clinical Neurology states: “the frontal lobe – which includes the motor cortex but also functional areas responsible for initiative, judgment, abstract reasoning, creativity, and social appropriate behavior”.

More specifically, he identifies the Prefrontal Cortex, which is the area of the brain right behind our foreheads (see figure 13.4) as the area that is home to the “higher order association cortex involved in judgment, reasoning, initiative, higher order social behavior, and similar functions”.

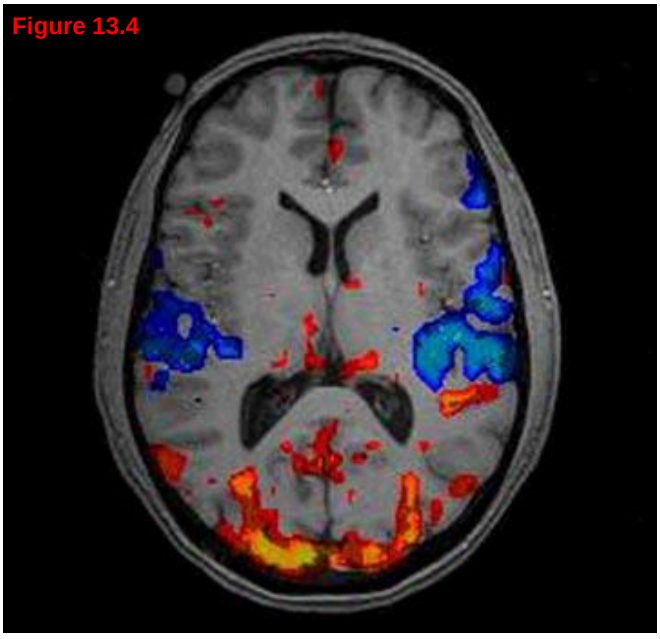
Did you know?

Memories are more likely to stick if they combine information and emotion.

Did you know?

During the early stages of fetal development, around 250,000 neurons are created per minute!

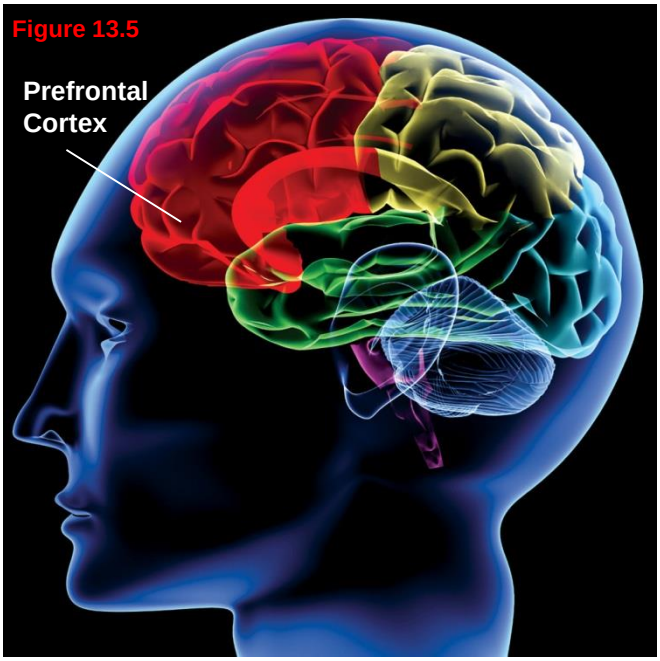
Figure 13.4



Did you know?

The part of the brain that recognizes an object is different than the part that locates it.

Figure 13.5



Notes (6): Despite this progress, the brain is still considered as a mystery by most

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Similarly, National Geographic's special edition on the Brain "Your Brain: A hundred Things You Never Knew" sites "the prefrontal cortex, right behind the forehead, is the most likely home for many of the neural processes associated with the G factor" – "The G- factor is the general measure of mental ability, found in vocabulary size, mechanical reasoning, and arithmetical computations". It goes further to cite evidence by saying "when it is damaged, a person suffers a variety of impairments to abstract reasoning, and it lights up during brain scans taken during some intelligence tests".

Did you know?

Smell is the most powerful sense in triggering memory? Almost ¾ of what our brain perceives as taste comes from the nose. For example smelling chocolate and eating broccoli afterwards may produce a very different taste!

18 or 25? – The Science

The prefrontal cortex "doesn't hit adult levels until the age of 25" according to Jay Giedd of the National Institute of Mental Health. He goes on to state "At puberty, you have adult passions, sex drive, energy, and emotion, but the reigning in doesn't happen until much later.. it is no wonder perhaps that teenagers seem to lack good judgment or the ability to restrain impulses".

These observations are echoed by all neurologists from Goldstien (1936) and Halstead (1947) to Arthur Shimamura (2000) and Miller, Freedman, and Wallis (2002). There is wide spread consensus and considerable evidence that suggests that the prefrontal cortex is responsible for our cognitive capacity to reason, make judgments, analyze, hold our behavior in check, weigh alternatives, and much more. It is what differentiates us from the rest of animals as reasonable beings. Thus, the Prefrontal Cortex is often dubbed as the "executive function" or the area that is responsible for "executive control". Evidence shows that when this area of the brain is damaged, the person's ability to engage in higher cognitive functions is severely compromised.

In this chapter, we took a brief tour through the human brain, focusing primarily on the Cerebral Cortex and the area of the brain (Frontal Lobe and Prefrontal Cortex) that is responsible for making us unique as human beings - conscious agents capable of filtering information, analyzing, judging, weighing alternatives, and making decisions. We also cited that the role of the human brain as the organ responsible for thought and mind, which was discovered just a few centuries ago.

Next, we will investigate whether the Quran makes mention of all this. Will it correctly identify the forebrain as the center of thought? More importantly, did it identify the Prefrontal cortex as the area responsible for making judgments?

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Anyone familiar with Islamic history can easily identify “Abu Jahel”, which literally translates to “The father of ignorance” as a key personality during Prophet Muhammad’s early years[7]. He is arguably the most despised personality of his time and a key opponent of the Prophet.

A staunch pagan, he dedicated his life to disgrace and humiliate Muhammad (pbuh). He would spend his entire day stalking, insulting, and preventing the Prophet from talking to anyone. Over the years, he would escalate his animosity further and go on to commit many atrocities including torturing and murdering converts to Islam, attempting to murder the Prophet, and eventually, waging war against the newly formed Islamic community.

In the 96th Chapter of the Quran - Al Alaq (which means something that clings, see Chapter 12), the author of the Quran addresses Abu Jahel. Pointing to his many atrocities and erroneous ways, he would go on to proclaim that if Abu Jahel did not stop these acts, repent, and see the error of his ways, he would be dragged by his forehead. What is so interesting is the verse that follows this:

أَرَأَيْتَ إِنْ كَذَّبَ وَتَوَلَّىٰ (٣٧) أَلَمْ يَعْلَمْ بِأَنَّ اللَّهَ يَرَىٰ (٣٨) كَلَّا لَئِنْ لَمْ يَنْتَهِ لَنَسْفَعًا بِالنَّاصِيَةِ (٣٩) نَاصِيَةٍ كَاذِبَةٍ خَاطِئَةٍ (٤٠) (96, 13-16)

“Tell me, if he rejects (the true faith) and turns away (13) Does he not know that Allah is watching (him)? (14) No! If he does not desist, We will certainly drag (him) by the forehead, (15) A lying, erroneous forehead. (16)

“A lying, erroneous forehead”; I remember reading this verse years ago and I could never understand why the author described an individual’s forehead as lying and erroneous. How could a forehead be lying? How can it commit error?

It is only when I studied neurology that it made perfect sense and I realized the wonder of this verse. The prefrontal cortex, the area of the brain that is responsible for filtering and analyzing information, organizing thought, weighing alternatives, and making judgments and decisions, lays right behind our forehead!

To suggest that the Quran identifies the brain as the center of intellect is one thing, but to suggest that it specifically identifies the area of the brain that is responsible for executive functions is phenomenal. So, the question I ask the reader is this: is the suggestion valid? Or is it just a coincidence?

One must admit that the notion of a coincidence is far fetched. The author of the Quran does not make a habit of describing other parts of the body as lying and erroneous. The verse would also not make any sense if viewed in a different context. Thus, it is evident if one were to think objectively that this is not a coincidence; that there is something deliberate about this description. It is as if the author is describing Abu Jahel’s frontal / prefrontal cortex as erroneous because it is not able to distinguish right from wrong, understand the message, see the truth, or stop him from acting in the most unjust and barbaric of ways.

Such a conclusion is awe inspiring. How could the author of this ancient document have known this at a time when the rest of the world attributed cognitive function to the brain’s ventricles? How could he have pinpointed the exact region of the brain responsible for higher cognitive thinking? It appears that the mysteries of the Quran, much like the human brain, are bound to leave one lost for words.

Notes (6): Abu Jahel is Prophet Muhammed’s Uncle

Primary Sources

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Photo and Figure Sources

- Chapter 13 Cover Page Photo Source: http://www.neuropsychnd.com/
- Figure 13.2 Photo Credit: Henry Vandyke Carter - Henry Gray (1918) Anatomy of the Human Body
- Figure 13.3 Photo Credit: http://www.uic.edu/classes/bios/bios100/lectures/nervous.htm
- Figure 13.4 Photo Credit: http://www.open.edu/openlearn/body-mind/health/health-sciences/how-fmri-works
- Figure 13.5 Photo Credit: Human Brain image Gallery

Editors

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