The Believing Brain: From Ghosts and Gods to Politics and Conspiracies---How We Construct Beliefs and Reinforce Them as Truths Study Guide

The Believing Brain: From Ghosts and Gods to Politics and Conspiracies---How We Construct Beliefs and Reinforce Them as Truths by Michael Shermer

BOOKRAGS

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Plot Summary

"The Believing Brain" by Michael Shermer describes how the brain works in establishing its complex belief system. The book is launched by the stories of three individuals who changed their fundamental belief system based on a specific event or an epiphanic transformation. Chick D'Arpino's entire life was changed when he was contacted by an alien who delivered a message on how to save mankind. Shermer interviewed the man and was certain that there was no psychosis. The materialization of the alien visitor may have manifested from the stresses of a divorce, but it was real to D'Arpino who never stopped believing it. Dr. Francis Collins' conversion from atheist to Christian is a contrast to the third story, which is the author's account of his own conversion but his was from Christian to atheist.

Shermer goes on to explain the biology of belief and how the brain's belief system is formulated and established. It is through gathering information and forming patterns or paternicity that establishes the foundation for belief. Agenticity adds dimension to beliefs by the brain's process of interjecting "agents" that represent beliefs. According to Shermer, there is a neuron in the brain that enhances the belief process by producing excessive amounts of dopamine, a chemical that mimics the high that an individual experiences form drugs or sex. This feeling of pleasure is the carrot the brain holds out for the person to buy into a belief.

The reasons that people believe in the unseen are laid out by the author. The "unseen" includes everything from God and the Devil to Aliens and everything else in between. It is Shermer's conclusion that man created God and not the other way around. He describes the benefits that people receive from believing in the mysterious and unknown. He draws comparisons between God and Aliens since both are perceived to have intelligence far beyond that of man, are all powerful, and maintain a high level of mystery. Belief in conspiracy theories are also discussed and, like the invisible entities that people believe in, these conspiracies are rarely proven but live forever. Shermer makes the comment that often beliefs are established first and the brain is tasked with making them real. This system of belief is called belief-dependent realism or beliefs are made real by the brain attaching selected, cherry-picked evidence to support them.

The last section of "The Believing Brain," covers the role of science in belief. Through the ages, it has been science that has fought to find and learn the truth. However, mankind has resisted the truth at every turn. The brain struggles to always be right. All men, even scientists, fight new information if it doesn't match their established beliefs. The brain always wants to be right and it will do everything it can to prove that it is.

Chapter 1: Mr. D'Arpino's Dilemma

Chapter 1: Mr. D'Arpino's Dilemma Summary and Analysis

In 1966, Check D'Arpino was alone when woke from his sleep to hear a voice that was neither feminine or masculine and was not connected to any apparent source. Chick D'Arpino asked Michael Shermer to write an essay on whether there was a "source out there that knows we are here." (p. 11). D'Arpino was open to whether this source was "God" or "ET." It was September 8, 2001, three days before the terror attack on the US. Shermer wondered why a former bricklayer was interested in such a deep question even to the extent that he sponsored essay contests and seminars. Shermer figured that Chick had come to him because he'd read about his work with auditory hallucinations and lucid dreams.

After being pressed by Shermer, D'Arpino admitted that his interest in the subject stemmed from the voice he heard years before. He wouldn't tell him exactly what the voice said but it was about love. At the time he had demanded to see President Lyndon Johnson to deliver the message to him. The authorities took him to a psychiatrist instead.

Shermer was quite sure that the voice that D'Arpino heard was an internal one. D'Arpino was going through marital problems at the time and stress was probably what triggered the experience. Maybe it was just a "brain hiccup," but based just on that one experience, D'Arpino was definitely not psychotic.

As a young undergraduate student of psychology at Pepperdine University in the 1970s, Shermer spent weekends at Camarillo State Mental Hospital to spend time with schizophrenics and other psychotic patients. In preparation for this field work, Shermer's professor required his students to read David Rosenhan's paper, "Sane in an Insane Land," in which perfectly sane people were admitted to psychiatric hospitals and posed as demented people who claimed to have heard voices. All of them were treated as psychotic by the professional staffs even when they claimed the "voices" they heard had disappeared. The only people that suspected that they were plants were other patients. Rosenhan concluded that the trained professionals concluded that these subjects were insane because they were institutionalized. Seeing is believing.

The mind is man's identity. Man's capacity to understand comes from the mind itself. This understanding and self-perception of one's mind is an endless loop. D'Arpino maintained that the "source" of the voice was "out there." He advocated for the UN to send an on-line message to alien beings inviting them to earth. Although Shermer was not a believer, as a scientist he had to stay open to any possibility. D'Arpino's journey was a testament to the power of believing.

Chapter 2: Dr. Collin's Conversion

Chapter 2: Dr. Collin's Conversion Summary and Analysis

It's not just uneducated bricklayers who have auditory hallucinations. Dr. Francis Collins, M.D. and Ph.D., and former head of the Human Genome Project, had his own life-changing epiphany. The powers of belief can happen to anyone. In his book, "The Language of God," Collins described his journey from atheist to theist. His education and background in science was not fertile ground for religious belief. Collins began to believe that God existed outside the universe. He was influenced by C.S. Lewis who wrote that Jesus was either to be viewed as a lunatic or demon or was to be believed. It was a choice. In touch with nature one day, Collins fell in the dewy grass and surrendered to Christ.

Recalling his journey of belief to Shermer, Collins indicated that it was during a period of stress from overwork and lack of sleep that the thoughts of God began to emerge in his mind. Ultimately, he felt called to it. Collins felt that everyone fell into a spectrum of total belief in God to a total disbelief in God. As a scientist, he had built up a natural resistance to anything that could not be proven but his emotional experiences as a medical student began to chip away at that veneer. It was his experience with many terminally ill patients whose faith in God gave them assurance and comfort. Collins found comfort in the readings of C.S. Lewis who had also struggled with the question of faith and God. Collins explained that his conclusions about God differed from others who had similar experiences because God gave everyone free will. To think own self be true. It is a myth that the greater one's intellect the less likely one is to believe in God. In fact, the more intelligent a person is who commits to a belief, the better that person is at rationalizing it.

Chapter 3: A Skeptic's Journey

Chapter 3: A Skeptic's Journey Summary and Analysis

In this chapter, Shermer reveals his personal journey of beliefs - religious, political, economic, and social. Shermer was once a born-again Christian who lapsed into disbelief. Creationists blamed Shermer's secular education and his belief in evolution on his religious demise. He was not born into a born-again family. In his senior year in high school, influenced by friends, he announced to his family that he was born-again. Shermer became a "Bible thumper" and a "Jesus freak." At Pepperdine, he maintained his faith during his undergraduate studies.

But in his graduate work at California State University, the foundations of Shermer's belief were beginning to crack. He took a course in evolutionary biology. During this time, Shermer was not surrounded by a throng of believers and he began to feel free to question things. He was intrigued by evolution and went on to take ethology or the study of the evolutionary origins of animals. This period was nearly two decades before the emergence of evolutionary psychology as a science but it laid the groundwork for Shermer's work in the evolutionary origins of both religion and morality.

Shermer admitted to himself that he no longer believed. He realized how annoying he must have been when he was trying to save everyone during his born-again era. Abandoning religion, he also realized that his belief had been a filter for everything else in his life. One question that was pivotal in his loss of faith was: If God is all-powerful and all-knowing why does he allow evil to exist and bad things to happen?

Growing up, Shermer was raised in a fiscally conservative and socially liberal household or libertarian by today's lexicon. He was greatly influenced during his time at Pepperdine by Ayn Rand's "Atlas Shrugged." Rand's general tenets included: "objective reality, reason, self-interest, and capitalism." (p. 47). She had a passion for life and values. Rand conveyed passion for life and values. This influence, led Shermer to explore works on the science of markets and economies and the philosophies of liberty. Shermer became a radical for freedom.

Also impacting Shermer's socio-economic beliefs was his tutelage under a retired physicist named Andrew Galambos who thought Rand's advocacy of "limited government" wasn't conservative enough. He saw the ideal country as a society that was completely privatized ultimately rendering government unnecessary. Although Shermer bought into some of the old scientist's theories, once away from his influence he realized that many of them could not apply to the real world. Private arbitration would not solve problems such as property disputes between two parties—an outside entity, an unbiased regulator or government, was necessary. One of Galambos' protégés, Jay Snelson, was an advocate of Austrian economist Ludwig von Mises whose 1949 work, "Human Action," depicted the countless ways in which government stood in the way of freedom. Mises' doctrines became the basis for Shermer's beliefs in freedom and ideas

that brought together his passion for science and his love of liberty which led to his current beliefs and practices. Good science is based on a blending of data, theory and narrative. If any of these elements are missing, science deteriorates.

The closing passage of this chapter demonstrates that Shermer is not burning all his bridges about the existence of God. Shermer feels that if he is wrong and there is a God that this benevolent God would understand that Shermer did the best he could with the tools he was given and the experiences he had. God would forgive him.

Chapter 4: Patternicity

Chapter 4: Patternicity Summary and Analysis

Hearing a rustling in the bushes a man thinks a predator is about to pounce. However, he discovers it was the wind. This is an example of a Type I error in cognition or a false positive which is believing something is real when it is not. A Type II error in cognition is a false negative which is believing something is not real when it is: The man thought it was the wind but it was a predator. The brain is a belief engine which collects data and formulates patterns for our benefit and survival. Shermer coined the word "patternicity," a process to find patterns of meaningful as well as meaningless noise. Modern man is the descendent of those primates who had the most success in interpreting those patterns.

Science is the only arbiter when there is speculation that something can cure or cause a disease. The recent assertion that vaccinations cause autism became part of the dialog about the condition and was accepted by many as truth. It was such an emotional issue and engendered hope in many parents who chose to believe the myth rather than the experts who informed that there was no connection between vaccinations and autism.

Patternicity is common in the animal kingdom. Early studies in evolutionary biology discovered the ability of many species to form lasting patterns also known as instinctual behavior. Face recognition in humans is another form of patternicity. This ability was built into our brains through evolution because it was essential for the establishment and maintenance of relationships and the identification of emotions in order to establish trust between one another. Research demonstrates that the brain first recognizes the shape of the face, then the two eyes and finally the other features. The process is so rapid that these stages are imperceptible. The universal greeting despite language or culture is generally a smile. Mimicry is an aspect of patternicity. If an animal avoids certain black and yellow insects because they are poisonous, it is found they often avoid all black and yellow insects—even those harmless to them. Super-normal stimuli are used by some women to be more appealing to men; breast implants, make-up and high-heels all stimulate reactions from the opposite sex.

Superstitions and belief in myths are part of patternicity and perhaps a harmful part. A ten-year-old girl who was unable to establish an attachment with anyone was subjected to Attachment Therapy, which included physical confrontation of the child. In their fervor to "cure" the girl, therapists covered her in a blanket and laid on top of her in order to simulate the womb experience and thus give her a new start. Unfortunately, they smothered her to death. Science could have confirmed that this process was flawed but the therapists bought into a process that they believed to be curative.

Chapter 5: Agenticity

Chapter 5: Agenticity Summary and Analysis

Unlike other animals, man has the ability to infuse patterns with meaning, intention and agency which Shermer calls "agenticity." Man often imbues patterns with intentional agents such as souls, spirits, ghosts, gods, demons, angels, aliens, the intelligent designer, and conspiracists instead of natural laws that actually make up the world. This tendency stems from man's attempts to find meaning in the meaningless. Even highly intelligent humans believe that powerful sources are operating in the universe that are not substantiated by science. Examples of agenticity abound. A child thinks the sun follows him around and will depict the sun with a smiling face in a drawing. Bananas and oysters are thought to enhance sexual potency because of their genital-shaped appearances.

Agents exist through the ages, however, their appearance and origin change. Five-hundred years ago, demons were the feared agents; two hundred years ago, it was ghosts; and in today's world, modern man fears aliens. Research indicates that "close encounters" with supernatural beings are generated by micro-seizures in the temporal lobes. These supernatural episodes include contact with angels, saints, demons, aliens, and out of body experiences. It is thought that such misfirings of the brain could be attributed to natural events like earthquakes that generate excessive electromagnetic fields.

Belief in the hidden powers of the paranormal is an extension of agenticity. Some advocates believed in the scratchy sounds that came from a "telephone to the dead," were their dearly departed. Shermer attributed this phenomena to their willingness to "believe" what they were hearing were the voices of their loved ones reaching out to them from the world beyond. One of the best times to learn how the brain works is when it doesn't work or when it is under extreme stress. Mountain climbers who are in perilous situations have often recounted that they felt the presence of an invisible presence, a guardian angel, who helped them find their way.

Shermer concludes that there are possible explanations for belief in superstition or magical thinking: 1) an extension of sense of self; 2) emotionalism; 3) physical response; or, 4) psychological reaction.

Chapter 6: The Believing Neuron

Chapter 6: The Believing Neuron Summary and Analysis

The term "mind" is the word that is used to describe neural activity in the brain. The mind does not exist without a brain. The fundamental structure of all thought and brain activity is the neuron. Understanding how the neuron works is key to understanding belief. The brain consists of a staggering number of neurons about a hundred billion of several hundred different types. The strength of neuron transmissions is measured in three ways: 1) by transmission frequency 2) type of neuron; and, 3) number of neurons involved. This process is endless and therefore the brain is an infinite information processing machine. One way the brain fulfills its primary purpose—the functioning and survival of the body—is through association learning or patternicity which is the link between the neurons and human action.

The chemicals in the brain trigger neural transmissions. The chemical dopamine seem to be the one most closely associated with belief. The brain stem contains thousands of dopamine-producing neurons which are released when a person has a reaction that is more positive than expected—which establishes a pattern and causes the person to repeat the behavior. Dopamine has also been linked to a peanut-shaped collection of neurons that is referred to as the "pleasure center" of the brain. It is associated with the high that results from drugs and sex. The downside to dopamine production is that it enhances addictions such as gambling, pornography, and drugs. Additive ideas are also associated with dopamine which can account for mass suicides such as the Jonestown tragedy and the religious fervor that led to the terrorist attack of 9/11.

Dopamine enhances the transmission of signals between neurons. It increases neural firing in association with established patterns and therefore increases response and learning. In higher doses, however, it can trigger psychosis and hallucinations. The right hemisphere of the brain perceives patterns more readily than the left brain. Research has demonstrated that more meaningful patterns are detected by the right hemisphere for both "believers" and "skeptics." Most recent studies reveal differences in left and right brain but the differences are more nuances than previously believed. Dominance by one hemisphere is not a bad thing since creativity in all fields appears to be related to the right-brain.

Creativity is directly connected to the ability to discern unique patterns within given contexts or environments. The personality trait "psychoticism" appears to be closely associated with higher levels of creativity. Creative individuals proved to be more inclined to participate in "associative thinking" as opposed to being "goal oriented." Rather than looking for something in particular, the creative mind is open to deal whatever it encounters.

Another activity of the brain is called theory of the mind or a process in which individuals are aware of their own beliefs, desires, and intentions as well as that of others. This is a high-minded automatic system that is triggered for specific activities in social settings. These are some deeply-rooted activities that are basic to survival.

How do some people believe things that are beyond reason and understanding? The simple answer is the belief comes first; reasons for these beliefs are then confirmed based on the realism necessary to support them. In other words, people cherry-pick facts to support their beliefs. They discard that which does not fit their beliefs. Ideological institutions praise belief and punish skepticism, which is an external impetus to further convince the brain to believe.

Chapter 7: Belief in the Afterlife

Chapter 7: Belief in the Afterlife Summary and Analysis

Shermer is a monist or a scientist who believes that mind and brain are one. Those experts who believe that the brain and the mind are two separate entities are referred to as dualists. To some, the soul is the unique identifier of a person. If the person dies, the monist believes the soul dies as well. Memories and traits are recorded in DNA and when the DNA dies that recorded data is gone: no brain, no mind, no body, no soul. The dualist believes that the soul outlives the body and lives again in an ethereal sense.

There are scientific reasons for belief in an afterlife. These reasons do no prove there is an afterlife, they only provide evidence why the mind is fertile ground for such belief. There are six specific reasons why the mind would buy into the concept of an afterlife. Belief in afterlife is: 1) a form of agenticity; 2) a form of dualism; 3) a result of theory of mind; 4) an extension of body schema; 5) rationalization by left-hemisphere interpretation; and, 6) a result of the ability to envision one's body in another place and time. There are four reasons that support the existence of an afterlife. First, it is scientifically confirmed that energy (matter) can never be completely destroyed. Secondly, the existence of psychic power indicates brain activity that is effective beyond one's body. Next, quantum consciousness states that everything in the universe is ever-connected. And, lastly, testimony from thousands of people who claim to have had out-of-body experiences.

The mind's belief system is structured so that we will seek evidence to prove our belief. Therefore a good measure of skepticism is important when dealing with matters of faith and spiritualism. Monism is in direct conflict with religious dualism. Either the soul survives death or it does not. Monism in no way excludes treating one another well in this life. The difference is that the rewards for being kind and charitable are reaped in the here and now and not after death.

Chapter 8: Belief in God

Chapter 8: Belief in God Summary and Analysis

Eighty-four percent of the world's population belongs to some form of organized religion which at the end of 2009 represented 5.7 billion people. There are some ten-thousand different religions. America is among the most religious countries. Even among atheists, there is a prevailing sense that something else is "out there." Why do so many people believe in God? One answer is that God is the ultimate pattern that answers everything. God is also the ultimate agent who gives our lives meaning. Although religions vary widely, at the core of most every religion is a supernatural being or spirit. The brain is prepped for belief in God in three ways through "evolutionary theory, behavior genetics and comparative world religions." (p. 165).

Charles Darwin noted in "Descent of Man, that belief in the spiritual world was universal and could be attributed to man's superior intelligence and natural curiosity. Organized religions perpetuate myths and encourage conformity. Social institutions such as churches are successful due to certain universal traits present in all people. The majority of people have a general belief in the supernatural; are familiar with rituals about death; buy into fortune (blessings) and misfortune (punishment); are intrigued and knowledgeable about folklore and magic, to name a few. Although such traits are not specifically controlled by genes, it is apparent that there is a genetic predisposition for them. Culture is one of the strongest indicators of what religion a person will ascribe to. However, the propensity to believe in God is hardwired in everyone.

Studies conducted on identical twins separated at birth found that the measure of their subsequent religiosity as adults was double that of fraternal twins separated at birth. This led to the conclusion that genetic factors account for a large percentage of religious beliefs. Chemical reactions in the brain, especially those originating from dopamine-producing neurons, are thought to be at least partially responsible for the cognitive process used in selecting specific religions.

A wide variety of theories have emerged over the comparative study of why people believe in God. It is the author's belief that man created God and not vice versa. One piece of evidence is geography—most people born in America are Christians and most people born in India are Hindi. Most people do not study all religions and pick one. They are raised by their parents to believe in a certain religion and their parents were raised by theirs in the same fashion. There are similarities in religions of virgin births and Messiah-like figures. After Jesus rose from the dead, Apollonius of Asia Minor appeared and claimed to be the son of God. Part of what appeals to people about religious myths is that people are predisposed to like good stories.

Most people in the western world are advocates of monotheism or the belief in one god. Whether there is a god is a question that is often posed. The burden of proof is on the believer to prove that his god exists. There is evidence in the sciences that "God" is a

human creation. Most consider God to be a spiritual entity, outside of our space and time. If this is accepted, then it is not possible for any human to be certain that there is a God. We can only know with certainty the finite things that we can touch and see. Believers skirt this issue by providing "testimony" and "personal revelations" as evidence of God's existence. Lending an impartial eye to religion, it is Shermer's conclusion that religion and God were creations of man to reduce conflict and encourage proper social behavior.

Chapter 9: Belief in Aliens

Chapter 9: Belief in Aliens Summary and Analysis

In 1999, Shermer met with Joe Firmage a Silicon Valley phenom who wanted to discuss a method to transport humans to the stars and beyond. Firmage's interest stemmed from an encounter he had in 1997 in which he claimed he was awoken one night by an alien who was floating over his bed. After the experience, he left his corporation behind and founded the International Space Sciences Organization which was established to advance human understanding of the universe. Firmage wrote a book entitled, "The Truth," which was an appeal to the scientific community to consider the reality of UFO's and the advanced scientific technologies that would facilitate rapid space travel. He also founded "Project Kairos" to prepare humans for future contacts with aliens. This young Internet genius did all this because he believed in aliens and the desire to have contact with them. Firmage's encounter and his reaction to it was another example of belief-dependent realism—it was real because he believed in it. Perhaps not coincidentally, Firmage was raised a Mormon whose founder, Joseph Smith, also wrote of an encounters with an aliens.

Whitley Strieber claimed to have been abducted by an alien and wrote the abductee's Bible, "Communion." Not surprisingly, Strieber was a writer of science fiction and horror which indicated that the man had quite an imagination, and of course, it would take a vivid imagination to create a story about being abducted by aliens. Many of those claiming to have been victims of alien abductions only remembered their experiences through hypnotic regression. The problem with that was that experiences aren't recorded as in an audio recording. If an experience isn't "used" it is gone—there is no device to save it. It has been proven that the therapists conducting the regression hypnosis on these subjects asked leading questions. Sleep anomalies were also found to be associated with alien encounters and appear to be related to dreams, especially lucid dreams and sleep paralysis.

Scientists do not know if we are alone in the universe. The scientific community does not know because there has not yet been any proof that there is life on other planets or in other parts of the universe. It is doubtful that if aliens do exist that they would look even remotely like humans. Most of those who believe in aliens make a huge assumption that if there is life in another part of the universe that they would respond to our radio signal. Perhaps that's not how they communicate. Since man cannot communicate effectively with animals, it is a rather lofty goal to assume we could communicate with beings from a distant planet.

Neanderthals lived 300,000 years ago and, on paper, had an excellent opportunity for survival. Yet, they disappeared 30,000 years ago. Based on their artifacts and archeological records, Neanderthals did not display the same adaptability as the homo sapiens from whom modern man descended. The fossil records indicate that over the past thirty million years, hundreds of primate species have lived and become extinct.

Over the past six million years since the hominid split from the common ancestor of gorillas, chimps and orangutans—many hominid species have failed. The success of modern man is a fluke of nature but we should not be so naïve to think that our species is the center and purpose of nature.

Aliens fall into the same category as "gods" in that they are intentional agents that are based on belief-dependent realism. Another piece of evidence that supports the connection between "alien" and "god" is that both are believed to be far superior to man. Some experts theorize that believers feel that contact with the alien would be a form of salvation from above, which is an obvious spiritual reference.

Einstein and Hubble had beliefs about the universe as well. They both concluded that the universe could be explained through natural laws such as gravity and relativity. Whether skeptical scientists or willing UFO believers, the human mind seeks solutions and those solutions are found in patterns and agents. The scientist finds a comfort level in natural patterns while those wanting to believe in the unproven and even unbelievable will find the patterns that support their beliefs.

Chapter 10: Belief in Conspiracies

Chapter 10: Belief in Conspiracies Summary and Analysis

Agenticity can be found in flesh and blood. The source of the "demon" in conspiracies is human. Conspiracies are associated with political assassinations, unexplained disappearances and deaths of famous people. Conspiracies are also suspected to be plotted against society such as the secret spreading of aids or the distribution of cocaine and guns to the inner city. One thing conspiracies have in common is that humans are behind all of them. The term "conspiracy theory" is generally used as a pejorative to indicate that that lunatic fringe of society has an over-active imagination and is not in touch with reality.

All conspiracies cannot be dismissed out of hand. But there are certain elements of a conspiracy theory, however, that should send up the red flag. For example: There is no evidence to support it; the event would have been nearly impossible to pull off; the complexity of the theory is beyond reason; the multitude of people involved makes it improbable; the grandiose goal behind the plot is not believable; the number of small events that are linked together dilutes its probability; the presence of a sinister element or person lends itself to fantasy; the theory blurs facts with fantasy; the theorist has a strong element of distrust of government or authority; and, the unwillingness of the theorists to consider other facts or evidence.

Those who are vulnerable to believe in conspiracy theories have no filter in their pattern-detecting process. They connect the dots of random events that have little or no real connection. But by the time they process the pattern and assign an agent to it, it seems real to them. September 11th "truthers" point to every unexplained event of that day as proof of a US government conspiracy. The holocaust deniers will also focus on minutia that is unexplained to then leap to the conclusion that the entire holocaust never happened.

Despite the fact that unbiased experts have debunked the 9/11 conspiracy point by point, the truthers maintain their belief because they detected a pattern and decided that A equals Z and assigned agents who pulled it off and who were much scarier than Osama—George Bush and Dick Cheney. One of the strangest theories that emerged from the 9/11 conspiracy claims was that flight #77 did not crash into the Pentagon; rather, the building was hit by a missile. The conspiracists have a solution ready for what happened to flight #77 if it did not crash into the Pentagon: Bush had the plane destroyed and the passengers were murdered by his operatives.

The truth as it is known to the world was that 9/11 was indeed a conspiracy in that it was a secret plot by two or more people to commit a felonious and heinous crime against a people. But there is no mystery to this conspiracy as to who was behind it. It was clearly Osama bin Laden, the ringmaster who led his underlings in al-Qaeda in carrying out the

plans. There is not only physical evidence and testimony, there are claims of responsibility by bin Laden and others. There is also al-Qaeda's long history in acts of terrorism beginning with the 1983 attack on the U.S. Marine base in Lebanon and in the same year the first attempt on the World Trade Center. Additionally, in 1996 bin Laden issued a fatwa declaring a jihad or holy war against the United States. There is more than enough actual facts and evidence and logic to ward off the emergence of a conspiracy theory that pointed to anyone other than bin Laden and his thugs for the 9/11 attacks. But there are conspiracy theorists who are not satisfied with reality.

One rebuttal was that individuals who spread these lies (actually facts) are doing so to distract attention from the real truth which was that the 41st president of the United States saw it politically advantageous for some mysterious reason to slaughter thousands of the nation's citizens. Which portrayal of the the event is more credible and which is more difficult to believe? It is not even close!

Conspiracies do happen and can have great impact. One example is the assassination of Austrian archduke Franz Ferdinand and his wife, Sophie in June 1914 which ultimately led to World War I. The conspiracy was organized by an underground movement called the Black Hand who was fighting for Serbia's freedom. After the first assassination attempt against Ferdinand failed, the killers were given an unexpected second chance and were able to carry out their plot. Ferdinand and his wife were killed out in the open in a bloody episode rather than behind the scenes where it had been planned to take place. The foregoing is how conspiracies usually work since they don't go smoothly and unexpected things disrupt them.

Chapter 11: Politics of Belief

Chapter 11: Politics of Belief Summary and Analysis

Belief systems operate in the worlds of politics, economics and ideology. Left-leaning individuals will watch MSNBC and read the New York Times. They hate Sarah Palin and guns. Right-leaning individuals will watch FOX News, read the Wall Street Journal and love Dick Cheney and school vouchers. These are obvious examples of the mind deciding on a set of values and setting out to find information and opinion that will support them. But it goes deeper than that.

Research has revealed certain character traits associated with the two major political divisions. Conservatives suffer from uncertainty avoidance and have a deeply-rooted need for structure. They typically have an intolerance for ambiguity and are resistant to change. On a psychological basis, the conservative mind has neurons rooted in fear, aggression and dogmatism. Academia is entrenched in liberalism and tries to instill values and ideology in their students that will "cure" them of conservatism. The liberal slant is also present in the mainstream media which ties back to higher education since members of the press are well-educated and, in the most part, had a left-leaning education.

Liberals, on the other hand, can be portrayed as suffering from lack of a moral compass, an inability to make clear ethical choices, the wrong-headed belief that all people are equally skilled, and a reliance on government to even society's playground. A blending of the two types of political minds is called Libertarianism. Libertarians are socially liberal and fiscally conservative. While it is not difficult to predict how a conservative and a liberal will react to the same event, the reaction of Libertarians is more difficult to foretell.

Just as in religion, most young people inherit the political views of their parents. But as the young adults mature, they can begin to change their views based on their education and experience and the deeply-rooted moral emotions that help us to survive. The very foundation of our right/wrong views can be summarized in five psychological systems: 1) Harm/care: there is an innate sense of empathy and sympathy for others; 2) Fairness/reciprocity: this foundation leads to ideals such as justice and equality; 3) In-group/loyalty: this tribal instinct fosters patriotism and self-sacrifice; 4) Authority/respect: this instinct makes the way for leaders, law enforcement and governments; and 5) Purity/sanctity: this system influences social mores and morality. Research has revealed that liberals score higher than conservatives on numbers 1 and 2 while conservatives have high rankings in 3, 4, and 5.

In "The Blank Slate," Harvard psychologist Steven Pinker described the opposing political sides as The Utopian Vision and the Tragic Vision. The Utopian vision seeks to eliminate economic inequality, save the environment, eliminate racism and remove harmful carcinogens from food. The Tragic Vision is dominated by self-interest and

focuses on the expansion of the wealth of the wealthy but fails to consider or predict the consequences of each man pursuing his own goals. There is a third vision, a Realistic Vision, for those who feel that human nature is at least in some measure constrained morally, physically and intellectually. Most moderates, left and right, probably fall into the Realistic Vision sphere. Since everyone's beliefs are greatly influenced by the emotionalism that they are burdened with it should lead one to at least consider the another person's ideas and opinions. Of course, that is Pollyannaish since we are all hard-wired to always be right or at least think we are. So information that is contrary to our deeply-held convictions and established patternicity is disturbing, distracting, and not welcome.

Chapter 12: Confirmations of Belief

Chapter 12: Confirmations of Belief Summary and Analysis

When a person heads for the phone to call a friend and that same friend calls right before the person makes the call, many attribute the event to some kind of psychic power or activity. But actually, it is within the realm of probability which has nothing to do with magic. This probability thinking can be applied to miraculous events which are occurrences defined as nearly impossible. However, those events referred to as miracles are usually found to be within the range of probability. But such events stand out because they are unexpected and are catapulted to a magical status. Examples of folk numeracy include a focus on the minutia while ignoring the far more numerous and meaningless events that took place. For example, some site a few days of cool weather as proof that global warming doesn't exist and ignore weeks or months of unseasonably warmer weather.

The brain is predisposed to think it is always right. Our beliefs are confirmed by cognitive heuristics. A heuristic is the methodology used in solving problems with intuition, trial, and error or other informal ways. This process creates cognitive biases that all our beliefs - religious, economic, social, and political - are based upon. When we receive a new bit of information, we run it through our heuristics system and determine that the new data is true and retain it or decide that it is not true and discard it. The process does not require additional data since it would disrupt our only goal which is to prove that we were right all along. It is telling that the same facts can be presented to a liberal and a to a conservative and both sides buy into the new fact but feel that it supports their specific beliefs but for totally dichotomous reasons.

Hindsight bias is another way to prove we are right. When it looks as though the facts are overwhelmingly against our belief, we often revise history. We reconstruct the past and change facts so that our belief is not as challenged and we find a way to prove we were right. Hindsight bias is engaged full throttle when there is a disaster. When the Challenger exploded and lost the crew, many were adamant that the engineers should have seen it coming. A conspiracy theory resulted from some hindsight bias when the Japanese attacked Pearl Harbor. After the fact, speculation abounded that President Roosevelt not only knew that the attack was coming, he had orchestrated it. That conspiracy is still rehashed as the real truth to this day.

Self-justification bias is another method to prove we were right. This bias allows us to back-track on a decision we made and justify it by rationalizing that it was the best we could do under the circumstances. Another tool to prove that we were right is the attribution bias. While we are sure to attribute our achievements to our talent and ability, we often attribute the successes of others to luck, cheating or outside help. The sunk-cost bias is the tendency to believe something simply because we have invested so much time, energy and reputation in believe it. Casual observers would call the person

stubborn but in these cases, the ego on the line and admitting to being wrong would come at a heavy price. Status quo biases are employed to believe in something we are familiar with despite the possibility we wouldn't believe it at all if we explored it.

The endowment effect causes us to over-value what we own and under-value items owned by others. Framing effects refer to the way beliefs are staged for assessment. To prove that we are "right," we frame a result against the most positive scenario: A hundred people were saved in the storm and only fifty were lost. An anchoring bias is when the brain searches for any semblance of a standard no matter how fragile to support our belief. The availability heuristic is when the brain grabs onto a reason for failure. When we're running late, we notice that we hit every red light along the way which places blame for tardiness to an outside source.

Bottom line, our biases greatly impact our beliefs.

Chapter 13: Geographies of Belief

Chapter 13: Geographies of Belief Summary and Analysis

How do we tell the difference between the true and false patterns that we develop and tell the difference between real agents and the imaginary ones? When Ptolemy wrote "terra Australis" at the bottom of a second-century world map, it declared to the world that undiscovered worlds were out there and led to the age of exploration and discovery.

Ptolemy's note gave credence to the existence of new lands yet undiscovered. It provided something for explorers to believe in. Columbus' belief that there were new worlds across the Atlantic led to the discovery of the Americas. However, when Columbus first landed in the New World he thought it was Asia. Marco Polo's reports of Asian lands were sketchy and there was no knowledge of a land mass between Western Europe and Asia. Therefore, Columbus used perception and cognition in assuming that the land was Asia.

Another scientific landmark was the advancement in astronomy by Galileo beginning in 1609. He revived the science of astronomy and gave support to Copernicus's heliocentric theory that it was the sun that was at the center of our planetary system and not the earth. Galileo's innovative studies provided a belief system for generations to come about the sun and the existence of other planets and stars and the complexity of the universe. Even though the evidence existed for the Galileo's discoveries were accessible by simply looking through the telescope, there were some scientists who refused to dare take a look because they were so bought into old theories, specifically Aristolelian cosmology, which were being destroyed by the new information.

There was much controversy surrounding Galileo's work but the Vatican stepped in and Pope Urban VIII granted Galileo permission to publish his most famous work "Dialogue Concerning the Two Chief World Systems, Ptolemaic and Copernican," in which he defended Copernicus's theory. But Galileo went too far in his literary masterpiece when he chose to disparage the church. Many assumed that Galileo was imprisoned and tortured for his actions. But it was a legend, a conspiracy theory, and was not true. Although he was held accountable for his "sins," he was a respected scientist and was held under house arrest in very comfortable surroundings.

In his book, "Bodies of Water," Galileo referred to an experiment by Archimedes that disproved an earlier theory of Aristotle. He commented that Archimedes had no more authority than Aristotle but that his conclusions had agreed with the results of the experiment. In other words, his belief was based on proven science. Later, physicist Richard Feynman agreed with Galileo by simply saying, "If it [a theory] disagrees with experiment, it is wrong." What Galileo spawned was a battle of the books: the book of authority versus the book of nature. The Scientific Revolution was revolting against the Catholic Church and its reliance on scripture. The book of nature was relying on science

and nature. The book of authority was grounded in deduction, which was based on generalized conclusions that started with the general and went to the specific. The exact opposite was true with the book of nature which was based on induction, the process of gaining general conclusions from specific information. Galileo's innovative science shattered patterns that had been established for eons. With the resistance and controversy surrounding his discoveries, mankind can rest assure that they have been thoroughly tested time and again and can be relied upon as reliable information.

Chapter 14: Cosmologies of Belief

Chapter 14: Cosmologies of Belief Summary and Analysis

In 1923, astronomer Edwin Hubble ended any debate and confirmed that there were literally billions of galaxies. Throughout the centuries there were much speculation about the universe and many disproved theories. On of the biggest debates was whether or not all the stars in the sky were in one continuous galaxy. Prussian philosopher Immanuel Kant was the first to advance the theory of the existence of multiple galaxies. His theory which was dubbed the "island universe" set the stage for a debate that raged for many years.

Isaac Newton discovered that if white light passed through a prism the full spectrum of colors was displayed. That discovery was taken a step further with the invention of a device called a spectroscope which confirmed that the same spectra of colors was displayed when observing the sun. When observing distant stars, the pattern of the spectra displayed by their luminosity confirmed that the sun and the stars were the same type of celestial object. This discovery ultimately led to the sciences of spectroscopy and astrophysics.

The relatively new technology of astrophotography was established in 1888 with the publication of a photo of Andromeda which was referred to as "the nebular hypothesis made visible." (p. 311). The photo displayed a supernova explosion. But some astronomers declared that the the bright light in the photo could not have been a nova of a distant star, rather it was the transformation of a nebula within the galaxy. After further study and much controversy, it was finally accepted as a supernova explosion in another galaxy. The resistance stemmed from the scientists' inability to believe something that they, in essence, didn't already know. They were slave to established patternicity that controlled their cognitive thinking.

In the late nineteenth century, a wealthy industrialist named James Lick donated $1 million for the building of a new and powerful telescope. It was this advanced refractor telescope that captured what seemed to be indisputable proof of distant galaxies and apparently confirmed Kant's theory of the "island universe." The spiral shaped Whirlpool galaxy astonished the astronomers of the time. But still there was resistance to the discovery. Some astronomers held fast to their one-galaxy theory or what was referred to as the nebular hypothesis.

In 1923, Edwin Hubble took on the task of cataloging stars and other celestial objects. During his project, Hubble confirmed the existence of several supernova explosions. In fact, during the nine months of the project, he made note of nine novae and two other variables that he suspected to be novae. Initially he met with resistance as to the veracity of his findings. But in time, everyone in the scientific world came to accept his

evidence as truth. His advancements confirmed that the existence of the vast, active, living Universe that was populated with an infinite number of objects and galaxies.

The great debate over the universe demonstrates that in time science will provide solid proof that eventually will be accepted despite initial rejection by some. In this case, one scientist after the other continued to work to prove or disprove the theories that abounded about the universe. Those scientists who did not have pre-ordained conclusions were open to anything and finally found the truth.

There are two questions that science has not been able to answer: 1) What existed before the universe? and 2) Why is there a universe? The theist's answer is that only God existed before anything and that God's mysterious plans have not been revealed to man. The scientific world is limited because we live in a finite world and although we know what the definition of "infinite" is, our brains cannot really grasp the concept.

The Copernican principle states that man is not special. There are logical reasons to support that theory. The vast majority of the universe is not suitable for life - at least as we know it. There is evidence that the universe is expanding and changing and that it was not suitable for life prior to the big bang and may not be when it contracts. There is simply not enough that man knows about the universe and there are celestial objects yet to be discovered. There are theories for a multiverse that our universe is just one of many.

In 2010, Stephen Hawking and Leonard Mlodinow presented an answer to why there is something rather than nothing. Their theory is referred to as the M-theory which is an extension of the string and identifies eleven dimensions rather than the three that mankind is familiar with. M-theory is the only thesis advanced for an explanation of why the universe exists. If eventually proven, M-theory is a model of a universe that created itself.

The history of science teaches us that we are arrogant to think we have all the answers. For each individual, what he believes is based on his on particular belief journey and on what and how much he wants to believe.

Characters

Michael Shermer

Michael Shermer is the author and narrator of "The Believing Brain." But Shermer is also part of the book as he discusses his own experiences, studies and research in the search for his own beliefs and in understanding how the brain believes. In the first section, Shermer describes his personal journey from being raised in a secular home to then becoming a born-again Christian and then finally an atheist. He describes how in high school he was influenced by Christian peers who helped to support his newly-discovered religion and belief system. He maintained his religion in most of college, but near the end he learned more about the mind and science and began to question his beliefs. It was the beginning of the crack in his belief foundation and he eventually turned away from Christianity and became an avowed atheist.

In addition to being the writer of a number of other books, Shermer is a psychologist and science historian. With those skills, he brings a two-pronged approach to the book. He provides insight into the psychological reasons and needs that people have for establishing their belief systems. As a science buff, Shermer provides the clinical side of truth of how the only measure as to whether something is true or not lies in its proven scientific viability. His vast knowledge of the scientific search for truth is obvious and important to this work. However, his understanding of humankind and the flaws and securities of people adds another dimension to the account that keeps it from being too bookish.

Galileo

In 1609, Galileo Galilei, who was an Italian astronomer and mathematician, improved a telescope that had been invented by Hans Lippershey. He added a larger lens to the telescope that had been designed to spot the flags of approaching ships and turned the "looker" toward the heavens. By doing so, he was immediately able to spot undiscovered celestial objects. He was the first to conclude that the fuzzy-looking streak of light in the sky, the Milky Way, was comprised of an innumerable number of stars.

When any new scientific discovery is made, there are always skeptics and it was no different with Galileo's remarkable revelations. Many astronomers and scientists of the day were dedicated to other established theories, especially Aristotelian cosmology. Holding on to their long-held beliefs, many astronomers were critical and skeptical of Galileo's findings. Although the Catholic Church was wary of Galileo's discoveries as well, Pope Urban VIII gave Galileo permission to publish his most famous work, "Dialogue Concerning the Two Chief World Systems," in which he defended the Copernican principle which states that man is not special. The church felt ambushed and held Galileo under house arrest for his "sins." Galileo's action opened Pandora's box and led to a raging debate over the contents and size of the universe that lasted for

centuries. Galileo's search for truth was a turning point in astronomy and led the way for today's modern sciences including spectroscopy and astrophysics.

Chick D'Arpino

Chick D'Arpino was a brick mason whose life changed forever after he claimed to have been visited one night by an alien who delivered a message to him that would save mankind.

Dr. Francis Collins

Francis Collins, M.D. and Ph. D., and former head of the Human Genome Project, had a life-changing epiphany, transforming him from an atheist to a theist. Collins attributed at least part of this conversion to the spirit he observed in terminally ill patients that he was treating.

Charles Darwin

Charles Darwin and his book, "Descent of Man," is referenced in "The Believing Brain." Darwin had written that belief in the spiritual world was universal and could be attributed to man's superior intelligence and natural curiosity.

Albert Einstein

In the book's section about science and the cosmos, Albert Einstein's theory of relativity is referenced as a belief that is held in the world of physics.

Ayn Rand

Ayn Rand's "Atlas Shrugged" had a great influence on Michael Shermer as a college student. This work led Shermer to explore the science of markets and economies and embrace the philosophy of liberty.

Edwin Hubble

In 1923, astronomer Edwin Hubble ended any debate about the celestial bodies that existed in the skies. His work confirmed that there were literally billions of galaxies and that supernova explosions were occurring in distant galaxies.

Immanuel Kant

Prussian philosopher Immanuel Kant was the first to advance the theory of the existence of multiple galaxies and that earth existed in an "island universe."

Stephen Hawking

In 2010, Stephen Hawking and Leonard Mlodinow developed the M-theory, which is the only thesis that has been advanced to explain why the universe exists.

Objects/Places

Atlas Shrugged

Ayn Rand's blockbuster, "Atlas Shrugged," had a great impact on author Michael Shermer. Rand's general tenets included: "objective reality, reason, self-interest, and capitalism." (p. 47).

Copernican Principle

The Copernican principle states that man is not special. It was also Copernicus' contention that it was the sun and not the earth that was the center of the planetary system.

Island Universe

Prussian philosopher Immanuel Kant advanced a theory that the Milky Way was not the only galaxy that existed. In fact, he envisioned the universe full of independent galaxies. His thesis was referred to as the "island universe" theory.

M-Theory

Astrophysicists Stephen Hawking and Leonard Mlodinow advanced the M-theory in 2010. To date, it is the only theory advanced by scientists that attempts to explain why the universe was created.

Spectroscopy

The spectroscope was an innovation that was developed to confirm the color spectrum of light. It was the spectroscope that identified the sun as a star. The development of this device led to the science of spectroscopy.

Astrophysics

Astrophysics is an advanced study of the cosmos. It was established after the early work done by Galileo and other early astronomers.

Dialogue Concerning the Two Chief World Systems, Ptolemaic a

Galileo's masterpiece, "Dialogue Concerning the Two Chief World Systems, Ptolemaic and Copernican," advanced and defended Copernicus's theory.

Andromeda

Andromeda was thought to be a nebulae within the Milky Way Galaxy until astronomer Edwin Hubble's work revealed that Andromeda was actually a distant spiral galaxy.

Monism

Monism is the belief that the brain and the mind are one. Monists believe that the mind, soul, brain, and body all die together.

Dualism

Dualism is the belief that the brain and the mind are separate. Dualists believe that the body dies and that the mind or soul can live beyond the body.

Themes

Patternicity

The brain receives information of all kinds. Some of the information is factual and some is not. But the brain must process all the information it receives. It doesn't judge it for veracity but what it does do is find meaningful patterns in both meaningful and meaningless information. This process is called "patternicity."

There are different types of patternicity. Anecdotal patternicity is a common form of the process but can lead to faulty conclusions. If a person heard anecdotal information that a herb could cure a disease, he may place himself at risk if he forms a belief about the herb and takes it expecting to cure his own condition. The anecdotal information failed to mention that the person who was cured was also taking prescribed medications which is what really cured him. But the brain could take in the anecdotal information, like what it learned, create a pattern and establish a false belief.

It was recently widely speculated that autism was caused by childhood vaccinations. There was no scientific proof but desperate parents wanted to place the blame for their child's condition somewhere - the brain didn't want to blame itself for it - so when they heard that there might be a connection between autism and vaccinations, they eagerly grabbed onto it.

Even though all scientific and medical research has disputed the claim and explained that not getting vaccinations for children would be a real health risk, many parents chose to believe that vaccinations had caused their child's condition. In such cases, the brain had established a pattern from the information it received and developed a belief. When that belief was challenged, it chose to pick and choose the information it wanted to believe and disregard everything else, no matter what authority it came from.

Patternicity is a process that the brain uses to formulate beliefs. It is a powerful process that can be both beneficial and perilous.

Agenticity

Humans practice agenticity which is the "tendency to infuse matters with meaning, intention and agency." (p. 87). We insert agents into our established patterns and develop beliefs that the agents control our lives and world. Often these agents are invisible such as souls, ghosts, demons, gods, spirits and angels. Sometimes these agents are powerful aliens or evil people plotting against us.

There are many examples of agenticity. People imagine that moving lights in the night sky are UFO's. Others looking for a sign from above will see Jesus in their toast or Mary in a tree stump. It is a common practice of children to personify objects. They often draw the sun with a smiley face. Such behavior from a young child indicates that the brain

has gathered positive data about the sun. Perhaps the child has observed that the sun is "always there" for her and feels a protective and parental quality from it.

In some societies, certain foods and objects are believed to be aphrodisiacs. The banana and the oyster are two such items due in the main to their physical resemblance to human genitals. Many transplant patients hold the belief that their transplanted organ contains the spirit of the deceased donor. Another form of agency is a sincere revulsion most people would have in touching the clothing of a mass murderer. On the other hand, most people would not object to touch or even wear the clothing of a famous celebrity who is loved and adored by the public. Touching or wearing the clothes of either person would have absolutely no physical or psychological impact on a person, but the brain has assigned positive agency to one and negative agency to the other. The impact that these agents have seems absolutely real.

Belief-Dependent Realism

The brain creates patterns from information that it amasses. These patterns can be based on true and false information but once a pattern is recognized, it becomes part of the brain's belief system. Often the brain creates a belief from the data it receives and then goes about "proving" the belief. The main purpose of the brain is to see to the body's survival and to prove that the information it has stored is correct.

The brain has ways of convincing itself that its beliefs are founded in facts. The brain's reality is based on its beliefs which are not always true or factual. None the less, one of the brain's function is to prove that its beliefs are true so it gathers information that will fulfill that responsibility. The methods that the brain uses to confirm the veracity of its beliefs are referred to as biases.

The main method of self-verification is called the confirmation bias. This functioning seeks specific information that will confirm a belief. Anyone who watches cable news on a regular basis has observed politicians cherry-pick information that will suit their policies. Although there may be just as much information that will dispute their policies, their brain elects to disregard that information. But it's not just politicians who employ belief-biases, everyone has built-in belief processes. The brain employs the hindsight bias to reconstruct history to fit new knowledge. The brain uses the attribution bias to congratulate itself for being talented and successful while it attributes the success of others to luck, cheating or help from others.

Style

Perspective

"The Believing Brain" is written by psychologist and science historian Michael Shermer. The book is written in the first person with Shermer as narrator. Shermer has had a long career and has spent thirty years researching the processes that take place in the brain when beliefs are established. In addition to Shermer's knowledge of the subject, he is a best-selling author having written eight other books including "Why Darwin Matters" and "The Science of Good and Evil." It is doubtful that anyone would be more qualified to tackle the completed subject matter of the book than Shermer.

A generous portion of "The Believing Brain" involves the belief in the invisible including God. Shermer's personal path to belief included a conversion from born-again Christian to atheist. A dedicated Christian throughout high school and most of college, Shermer's belief foundation began to crack as his studies in psychology and science advanced. In his book, Shermer manages to remain neutral about religion and does not display an arrogant or condescending tone about those who do believe in God. He simply presents his theories as to why they do.

Shermer is a knowledgeable man and an expert in belief-dependent realism and the brain processes used to formulate beliefs. However, he presents himself as many learned men do, openly admitting that in the entire scheme of things, he knows very little.

Tone

"The Believing Brain" by Michael Shermer is written in several styles and tones. There are sections that are professorial and text-book like. The account of Galileo's work and scientific advancements in the field of astronomy is an example. The brief explanation of Steven Hawking's M-Theory is highly technical and will probably escape the understanding of most readers. But it's interesting fare and is included to help illustrate how science is at the tip of the spear in the search for truth.

Shermer is a psychologist and as such provides the human and vulnerable side of how the brain believes. He provides anecdotes and insight into the reasons that people believe what they do. Although he is a stated atheist, he does not display a condescending tone about the overwhelming majority of mankind who believe in God. However, he does provide his strongly-held convictions on why the brain is vulnerable to a belief in God and other mysterious entities like aliens and unproven events that are the fodder of conspiracy theories.

Although Shermer is obviously very knowledgeable in his field and has the education and experience to back it up, Shermer is consistent in his persona of gentle teacher. He provides what he feels is conclusive material but is open to other opinions. He

comments that he, like most scientists, knows that there are always surprises ahead and always more to learn.

Structure

"The Believing Brain," by Michael Shermer is separated into four main parts. Part I: Journeys on Belief contains three chapters, which cite dramatic events that changed an important belief system of two individuals and of the author as well. Part II: The Biology of Belief contains three chapters that describe the way the brain works in establishing its belief systems. Part III: Belief in Things Unseen contains four chapters that describe how the brain believes in invisible entities, including God and aliens and unproven events like conspiracy theories. Part IV: Belief in Things Seen contains four chapters and describes how people develop political ideologies, how internal biases confirm beliefs and how historical events and scientific advancements provide solid proof for beliefs.

Preceding the first part of "The Believing Brain," is a prologue entitled, "I Want to Believe," in which the author explains his inspiration for writing the book and his intended goals in writing it. The last section of the book is followed by an epilogue entitled, "The Truth is Out There," in which the author expresses his opinions on the role of science and truth. Following the prologue is a lengthy "Notes" section in which the author provides references and research sources used in the work. There is also an Acknowledgments section which credits other scientists and experts who contributed material for the book. There is also an Index and a short note about the author.

Quotes

"You are loved by a higher source that wants your love in return." (Chapter 1, p. 15).

"Since the brain does not perceive itself or its inner operations, and our normal experience is of stimuli entering the brain through the senses from the outside, when a neural network misfires or otherwise sends a signal to some other part of the brain that resembles an outside stimulus, the brain naturally interprets these internal events as external phenomena." (Chapter 1, p. 15).

"Either this man was, and is, the Son of God: or else a madman or something worse. You can shut Him up for a fool, you can spit at Him and kill Him as a demon; or you can fall at His feet and call Him Lord and God." (Chapter 2, p. 28).

"In theory, there is no difference between theory and practice. In practice there is." (Chapter 3, p. 50).

"Because we must make associations in order to survive and reproduce, natural selection favored all association-making strategies, even those than resulted in false positives. With this evolutionary perspective we can now understand that people believe weird things because of our evolved need to believe non-weird things." (Chapter 4, p. 62).

"Many highly educated and intelligent individuals experience a powerful sense that there are patterns, forces, energies, and entities operating in the word. More importantly, such experiences are not substantiated by a body of reliable evidence, which is why they are super-natural and unscientific. The inclination or sense that they may be real is our super-sense." (Chapter 5, p. 88).

"The neuron and its actions are to psychology what the atom and gravity are to physics, To understand belief we have to understand how neurons work." (Chapter 5, p. 113).

"We are blinded by what I call Protagoras's bias - 'Man is the measure of all things' - when we project ourselves into the alien Other." (Chapter 9, p. 198).

"Smart people believe weird things because they are better at rationalizing their beliefs that they hold for nonsmart reasons." (Chapter 12, p. 263).

"It is difficult to get a man to understand something when his job depends on not understanding it." ~ Upton Sinclair (Chapter 12, p. 266).

"When a distinguished but elderly scientist states that something is possible, he is almost certain right. When he states that something is impossible, he is very probably wrong." (Chapter 14, p. 311).

"If someone asks you what really happened at the moment of the purported Big Bang, the only honest answer would be: 'I don't know.'" (Chapter 14, p. 326).

Topics for Discussion

Describe what the terms "monism" and "dualism" mean. How are the different? Why do they lead people to different conclusions about the same issue?

What do the terms "patternicity" and "agenticity" mean? Why are these important to the ways in which people form beliefs?

What is belief-dependent realism? How are our beliefs confirmed? What is hindsight bias? What is attribution bias? What are other biases that help us form opinions?

Why was the advancements of Galileo important to today's science? What controversies surrounded his discoveries? Why did he encounter resistance to his theories even though he backed his theories with real evidence?

What comparison does the author make between God and aliens? What belief systems lead man to believe in God or in super-natural entities like aliens?

What important discover did the astronomer Edwin Hubble make? Why did some scientists doubt his findings?

What existed before the universe? Why is there a universe or why is there anything? Who advanced the M-theory and what does it propose?