

Biology of Religion: The Panic of Existence

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Prelude

Human: Not a Fallen Angel

The physical complexity of human evolution has been the subject of much research and investigation. The story of evolution was pieced together first through evidence from the fossil records, and ultimately has been furthered by genetic breakthroughs in DNA analysis. Even the fact that much of our body is constituted of primarily oxygen, carbon, hydrogen, nitrogen and other fine elements demonstrates how the stuff of our body, nature and cosmos are directly correlated. Such research faced metaphysical and religious difficulties, as it countered the old belief that humans were specially made by god, or were “fallen angels” from heaven, so to speak. But the narrative of science points to the fact that we are a high primate with great learning abilities, an “unfinished” product of nature. Through unremitting changes in our genes and environment, we evolved to become who we are today and will continue to evolve, since change is the basis of evolution.

Besides physical evolution, we can also look at clues about evolution of the human brain, and how cognition and thought patterns developed over eons. The changes ultimately resulted in the industrious ingenuities of humans all the way to the mind that conceived stories, myths, and religions. Factors such as genetic mixing through interbreeding with Neanderthals and Denisovans and potentially with other hominids may have been part of what led to the great diversity in the types of physical and mental characteristics of humans that we see today. Next to the macroevolution, the micro- or localized-evolution as well as the role of culture particularly during the Neolithic period all played roles in the rewiring of the brain for new tasks and activities. The diversity of human cognition is certainly a puzzle of evolution that may be linked to the distant past. Using other animals for comparison, one may say that certainly all dogs have different personalities, for example. Higher order primates show even more evidence of having diverse patterns of cognition. But despite their diversity, such animals show much more cognitive harmony than does the human species. It would be hard to refute that despite having one common human genome, human minds are incredibly complex and diverse.

Where did this complexity come from? How is it that the human mind and behavior can be both terribly violent and inspirationally altruistic? Or, both rational and irrationally dogmatic? We see such a range of dualistic behavior among humans: intuitive vs. counterintuitive, introvert vs. extrovert, rational vs. irrational, didactic vs. spiritual, and so on. In the following chapter, we will explore whether or not interbreeding, gene fusion, and biochemistry are contributing factors for the incredibly wide gaps in human cognitive function and ability. The range and magnitude of cognitive and behavioral differences could potentially have their basis in the remote genetic

history of the species. Such cognitive diversity has led some humans to manage their existential fear-anxiety through mythical thinking, while other humans tapped into a mind that was more rational.

In other words, what brought us to the mind we have today? How much has the human mind *really* evolved? What prompted certain humans to invent religion and mythology, something non-recognizable in nature, a purely human construction? And why did so many humans believe such myths while there were those who did not?

Certainly, this distinction is not always definitive, because the attraction toward one set of ideas or another can depend on cultural factors, childhood upbringing, the wiring of the brain in a given culture, mental plasticity, as well as social choices. So, it is not a sociologically linear question. People are always prone to change based on external influences coupled with their internal tendencies and personal interest. The nature-nurture debate remains both in the realm of biology and sociology. The question of how human cognition has evolved to take us to the level of myth and belief and how our minds have evolved beyond such things remains.

In exploring these questions, we will take a general approach to human evolution that emphasizes two major points of departure. The first is the emergence of hominid bipedality, and the rise of *Homo erectus* 1.5 million years ago with its new abilities, namely tool-making, harnessing fire, to 100,000 years ago when *Homo sapiens*¹ acquired more complex thinking.² The second is over the succeeding millennia, when *Homo sapiens* interbred with Neanderthals and Denisovans (and potentially with other hominids), since such gene assimilation may have been a factor in brain development with unprecedented innovation and diverse mental tendencies, both virtuous and vicious.

In addition, there was another critical juncture roughly 10,000 to 15,000 years ago. The Neanderthals and other competing hominids had by then been long extinct and *Homo sapiens* remained. The very gradual transition to agriculture began. Then, given the earliest agriculturalist communities, our ancestors began raising existential and metaphysical questions that demanded explanations suitable to their understanding. This behavior gradually gave rise to religion and bonded the tribe members together through a belief system. It is curious how the propensity and persistence in the belief of gods, hidden agents, miracles, magic, mysterious good-evil forces, and belief in another reality beyond this world arose in some societies more intensely than others, since everyone—whether hunter-gatherers or sedentary agriculturalists—was living in the same physical space and governed by the same laws of nature.

¹ The designation of “*Homo sapiens*” was given to humans first by the Swedish botanist Karl von Linné (1707–1778). “*Sapiens*” or “wise” is because of the ability of humans to use their mind. See Ashley Montagu, *Man: His First Million Years* (Cleveland, OH: The World Publishing Co., 1957), 20. Joseph Campbell calls *Homo sapiens* “secular man,” see Campbell, *The Masks of God: Primitive Mythology* (London: Secker & Warburg, 1960), 28.

² Frederick L. Coolidge and Thomas Wynn, *The Rise of Homo sapiens: The Evolution of Modern Thinking* (West Sussex: Wiley Blackwell, 2009), 5.

Even more curious is how within the same agrarian population who presumably had to share the same beliefs there were those who most probably remained skeptical. Eventually, there was a systematic resistance against superstitious beliefs, mythologies, and religions during the Iron Age when this opposition took a more outward shape. There seemed such contrasts in the workings of the human mind. Obscurity and clarity of thought, suffering and joy, ignorance and wisdom, tolerance and intolerance, and aggression and compassion, demonstrate the dominance of one behavior over another. Could these contrasts perhaps be the result of a combination of gene fusion, natural selection, division of labor, and much deeper issues in the function of the brain? We have alas more questions than answers. But what should be explicit in the next three chapters is that the forces of *biology* have influenced the unplanned or even haphazard cognition and behavior as witnessed in the course of history, seemingly not any predestined metaphysical source. The usage of biology on one hand is intended to convey a genetic predisposition as to why some people have a stronger inclination toward one behavior or another, and on the other to refer to using the mind and its rewiring through repetition and obedience. Biology also refers to the biology of fear that led humans to myth-making and resorting to supernatural powers or religion in order to appease their fear.

Chapter 1

A Tumultuous Human Evolution: The Leap and Lapse of the Mind

Human Evolution: What We Know

From the modern scientific viewpoint, humans are animals that evolved in nature and cannot be differentiated from the natural processes and the zoological world. Today, almost all the scientific evidence, including fossil records, genetic studies, and biological anthropology, points to human evolution from its lower form. This is demonstrated by the intermediate fossil record of Australopithecus, half ape-half human, and a dozen of other hominid species. Various intermediate fossils have pointed to the existence of proto-humans in the process of evolution. Some sort of hybrid fossil of Australopithecus and other *Homo* species, namely *Homo naledi*, almost human, was recovered in South Africa in 2013.³ The disciplines of evolutionary biology, paleontology, and genetics take human origins back to 50 million years ago when the first mammals began to evolve. Eventually primates separated from other mammals, and the human species further separated from their ape cousins about six million years ago. Based on the unearthed fossils, out of 350 different kinds of primates, the human species then evolved into different hominid species including the earliest hominids known as Lucy (Australopithecus),

³ See Jamie Shreeve, "Mystery Man," *National Geographic*, Oct. 2015, 30–57.

Turkana (*Homo erectus*), and tens of other categories and classes of hominids, all of which lived during the last 1.5 million years.

Neanderthals who migrated out of Africa a half million years ago shared a common ancestry with *Homo sapiens*. Our own species, *Homo sapiens*, whose fossil records goes back roughly 100,000 to 250,000 years ago, migrated out of Africa between 80,000 to 60,000 years ago. Despite the challenges of emigration out of Africa, modern humans managed to survive and reproduce. Interestingly, *Homo sapiens* and Neanderthals met “again” in the Near East through Central Asia and the European continent and interbred roughly 25,000 to 40,000 years ago. Over time, the Neanderthals along with other hominid species seem to have disappeared while *Homo sapiens* survived as the only contender for control of the territories. Genetic studies reveal however, that *Homo sapiens* is the gene carrier of not only the mammalian past, the high primates, but the gene carrier of the extinct hominids such as the Neanderthal and Denisovan among others. Thus, even more reason to view humans as a by-product of evolutionary nature rather than being predestined by god or separated from the zoological world.

Bipedality Before Thinking

Based on the fossil evidence thus far, walking on two legs (bipedal) dates as far back as three million years ago. Physical changes such as an “S” shaped spine that supported the weight of the body, along with the altered shape of the pelvis and feet indicate a significant evolutionary alteration in hominid anatomy. The shift to bipedality may have occurred for different reasons, such as a drastic change of environment from forest to grassland, a volcanic cause of deforestation, or even flooding. The environmental change may have been the reason to keep straight and become bipedal by holding the heads outside of flood water. This provided free hands to carry tools even though the bipedality did not prevent four limbs to be used in walking or climbing.⁴ Thus human colonization of the earth and the rise of civilizations were made possible by walking legs and grabbing hands.

The species could now migrate long distances on two strong and well-adapted feet. Bipedality and migration to distant lands also brought the species face to face with other hominid primates who had also migrated out of Africa, which became another source for further modifications. Bipedality was just the beginning of a new journey for future humans in having the means to explore and share other geographical regions often occupied by other groups and species.

Human bipedality also altered the character of human evolution due to the power of mobility and freeing up the hands for their work of tool-making and invention. Although such artisanal and cognitive skills did not cause alterations in physical DNA, the development of humans’ cognitive ability to *teach others and pass on these new skills* effectively caused changes in “cultural

⁴ C. Owen Lovejoy, “Evolution of Human Walking,” *Scientific American*, (Nov., 1988): 118-125, 118.

DNA.” This process of passing on what was invented would play an enormous role in the later processes of propagating myths, beliefs, and rituals.

Human primitive tribalism and territorial battles probably happened just like they did among other mammals, and primates, in particular due to limited resources. Evolutionary capabilities emerged not as personal choices but as means of adaptation with the environment over a long evolutionary process. The adaptational capabilities included cooperative hunting techniques, adapting to life in the forest and in caves, having a gastrointestinal system suited to eat vegetables and meat, and keen eyesight and the power to kill in the world of predators. Other abilities were sharpened such as jumping, swimming, running and swinging. Thus, bipedality was not a choice but the force of natural selection as a consequence of adaptation.

Certainly, the theory of human evolution as opposed to the creation theory has been a blistering topic for the last 150 years between science-oriented and religiously-minded communities. The theory of creation is based exclusively on belief, whereas the theory of evolution is based on evidence and empirical reasoning in the biological domain. Even as a substantial theory, the exact details of human evolution and its diversity have been a matter of inferential evidence. The theory of the evolution of modern humans should be viewed in light of the two prevailing views of evolution. The first is the single origin theory, and the second is the multiregional (or microevolution) evolution theory which still awaits more evidence to be established with certainty.⁵ As a whole, it can be assumed that fundamental evolution happened on the African continent with all of the earlier common ancestry. Humans began to migrate at several intervals. Each group colonized a region and gradually fashioned its own contained and localized microevolution. Microevolution and population diversity occurred in various regions of the world leading to all of the observable variability in humans’ inherited characteristics.⁶

This human microevolution throughout scattered natural habitats around the world became evident in two major ways: drastic language differences and immense variations in physiognomy. Insular, clannish, and geographical isolation gave rise to variations in behavioral patterns, cultural traits, mythologies, and even certain genetic diseases. Thus, on one hand, *Homo sapiens* possessed genetic homogeneity and universality. On the other hand, vast differences in various populations still remain region-based in ways that are not species-related, especially over the last ten thousand years.⁷

Interbreeding Between Humans and Other Hominids

⁵ Marta Mirazón Lahr et al., “Towards a Theory of Modern Human Origins: Geography, Demography, and Diversity in Recent Human Evolution,” *Year Book of Physical Anthropology* 41 (1998): 137–176, 138.

⁶ *Ibid.*, 137–176.

⁷ *Ibid.*, 169–170.

The source of human differences will have to be assessed against several dynamics and influences. These include interbreeding with older hominid species, natural selection, mutations, genetic drift, and biological innovation of the newer populations.⁸ The presence of Neanderthal and Denisovan genes in humans is probably one basis of influence, while other dynamics still remain for science to explore in order to understand cognitive differences and trends among human beings over the millennia.

Homo Neanderthalensis is a species of hominid that shared a common ancestor with *Homo sapiens*. Based on genetic evidence, *Homo sapiens* and Neanderthal shared a common ancestor some 600,000 to 800,000 years ago in Africa.⁹ This commonality is confirmed through mitochondrial DNA, showing that the proto-*Homo sapiens* and Neanderthals stemmed from a common stock.¹⁰ It is approximated that about a half million years ago these hominids went separate ways. As the fossil records show, Neanderthals migrated out of Africa and wandered into the Near East and the European continent. In contrast the *Homo sapiens* branch remained in Africa for a much longer period of time.

The first Neanderthal fossils were found in 1856 in the Neander Valley in Germany, seven kilometers from Düsseldorf.¹¹ Evidence of the spread of Neanderthal out of Africa has since been found in the Near East, as far as Siberia, and in Central Asia¹² and Europe.¹³

These Neanderthal fossils give us an image of a well-adapted species that left Africa and settled in different range of habitats. Their fate would change between 40,000 to 60,000 years ago with the arrival of a new species *Homo sapiens* who wandered out of Africa and into Asia and Europe and began encountering the Neanderthals.¹⁴ Their close common ancestry must have resulted in a similar reproductive system which made possible the interbreeding between Neanderthal and *Homo sapiens*. In the 1990s, a 24,500-year-old skeleton of a child was unearthed in Portugal that morphologically demonstrated a potentially plausible interbreeding between the two hominid

⁸ Ibid., 170–171.

⁹ David Reich et al., “Genetic History of an Archaic Hominin Group from Denisova Cave in Siberia,” *Nature* 468 (23/30 Dec. 2010), 1053.

¹⁰ Svante Pääbo, *Neanderthal Man: In Search of Lost Genomes* (New York: Basic Books, 2014), 185.

¹¹ Professors Johann Carl Fuhlrott and Hermann Schaaffhausen were the first to identify the bones of a newly discovered human species, which was given the name of the location where it was found, “Neanderthal” (*Tal* means “valley” in German – Neander Valley).

¹² Johannes Krause et al., “Neanderthal in Central Asia and Siberia,” *Nature* 449 (Oct. 18, 2007), 902–904.

¹³ The fossils of an earlier *Homo sapiens*, Cro-Magnon 5 feet 11 inches with brain capacity of 1,660 cc (somewhat larger than modern humans) was discovered in southern France in 1868 and 1872. See Montagu, *Man: His First Million Years*, 72–73.

¹⁴ Ian Tattersall and Jeffrey H. Schwartz, “Hominids and Hybrids: The Place of Neanderthals in Human Evolution,” *Proceedings of the National Academy of Sciences, USA* 96 (June 1999): 7117–7119; see also Jill Rubalcaba and Peter Robertshaw, *Every Bone Tells a Story* (Watertown, MA: Charlesbridge, 2010), 72–73.

species as well as ongoing hybridization for thousands of years.¹⁵ Other discoveries of fossil evidence of interbreeding followed.¹⁶

Apart from paleontological studies and fossil evidence, genetics also provide further and more precise interbreeding evidence. The Max Planck Institute for Evolutionary Anthropology in Leipzig over the last several decades has pursued genetic research in order to find genetic proof to confirm this speculation of Homo sapiens-Neanderthal interbreeding. Finally, through the arduous work of Svante Pääbo and his team at the institute, it was finally established that modern humans outside of Africa are carriers of almost 1 to 2 (could vary to 4) percent of Neanderthal genes.¹⁷ Interestingly, it is known (and can be seen through popular modern DNA tests) that many humans *today* still carry the Neanderthal genes.¹⁸ This revolutionary fact again reveals to us that Homo sapiens are not a pure species. It also means Neanderthal genes have not died out and are still present in people today, having been passed on to Homo sapiens by means of mating.¹⁹ In other words, the Neanderthal species (perhaps among other hominid species) may not be considered “completely” an extinct species but has a genetic presence in modern humans. The Neanderthal species was human, but merely a different version of the human species.²⁰

The mating with the Neanderthals would have occurred between 40,000 to 60,000 years ago, which would not be without some biological and cognitive consequences. These consequences are yet to be assessed and researched, but some similarities between the Neanderthals and Homo sapiens have been discovered already. For example, Neanderthals were physically similar to modern humans who shared (or interborrowed) certain cultural practices and behaviors.²¹ Certain parallels are burial rituals, making jewelry, and caring for the injured or the sick. There is evidence that since the Upper Paleolithic Era about 35,000 years ago, humans have observed the existence of certain religious burial ceremonies, ritual objects, and ancestor worship.²² This may have been either a cross-influence, or passed from the Neanderthals to modern humans. It seems that the Neanderthals made pigments to paint their faces and bodies, used feathers of certain birds for ceremonial purposes, developed local cuisines, and even used toothpicks.²³ The

¹⁵ Tattersall and Schwartz, “Hominids and Hybrids,” 7117-19; see also Jill Rubalcaba and Peter Robertshaw, *Every Bone Tells a Story*, (Watertown, MA: Charlesbridge, 2010), 72-3.

¹⁶ The discovery of a rare 55,000-year-old skull in Manot Cave of Galilee in Israel in 2008 suggests another hybrid of Neanderthal and Homo sapiens. The Cave was occupied by Neanderthals between 65,000 to 50,000 years ago. The location of this cave was a typical point lying between Africa and Europe where the interactions and mating between Homo sapiens and the Neanderthals could have taken place. See John Noble Wilford, “Skull Fossil Offers New Clues on Human Journey From Africa,” *New York Times: Science*, Jan. 28, 2015.

¹⁷ Pääbo, *Neanderthal Man*, 176, 194. See also Reich et al., “Genetic History of an Archaic Hominin Group from Denisova Cave in Siberia,” 1056.

¹⁸ See Pääbo, *Neanderthal Man*.

¹⁹ *Ibid.*, 188.

²⁰ Tattersall and Schwartz, “Hominids and Hybrids,” 7117.

²¹ Mirazón Lahr et al., “Towards a Theory of Modern Human Origin,” 151.

²² Matt Rossano, “The African Interregnum: The ‘Where,’ ‘When,’ and ‘Why’ of the Evolution of Religion,” in E. Voland and W. Schiefenhövel (eds.), *The Biological Evolution of Religious Mind and Behavior* (Berlin, Heidelberg: Springer Verlag, 2009), 131–133.

²³ Jon Mooallem, “Neanderthals Were People, Too,” *The New York Times Magazine*, Jan. 11, 2017.

Neanderthals also produced tar for glue to attach handles to tools and weapons some 200,000 years ago.²⁴ On the language ability, the gene analysis suggests the same potential ability in the late Neanderthal.²⁵ This fact is important as far as Neanderthals were our older and immediate evolutionary cousin who through interbreeding passed on some of their already advanced genes to us, not vice versa. Even their adaptive immune system against certain viruses or diseases – Human Leukocyte Antigen or HLA complex is believed to be passed down to us.²⁶

Thus, it can be acknowledged that Neanderthals were people too. Earlier paleontology may have gotten them wrong by pejoratively describing their intelligence as low and depicting their appearance as “cavemen.”²⁷ In fact, the Neanderthals developed large brains before Homo sapiens. There is the possibility that the transmission of some positive aspects of their cognitive qualities to modern humans may explain a progressive cognitive leap in Homo sapiens. For example, the emergence of Homo sapiens as modern humans with more advanced thinking and tool-making skills coincidentally took shape soon after the disappearance of the last Neanderthals during the last 25,000 years. This intellectual correlation is certainly a hypothesis, but perhaps a plausible one.

The genetic mixture that resulted from interbreeding may have contributed to qualities such as creativity and other higher-level cognitive functions, but on the other hand, could have caused certain changes in physiological and physical conditions. These changes include a propensity toward diabetes, high altitude intolerance, skeletal deformities, immune system disorder, and wisdom teeth in smaller jaws. Research suggests another hazardous genetic transfer from Neanderthal to modern humans: decreased fertility in males.²⁸

Even a *lack* of Neanderthal genes gives clues to the effects of interbreeding: Modern Africans do not have Neanderthal genes since the Neanderthals migrated out of Africa over half million years ago. Recent studies have shown that these modern Africans without Neanderthal genes have a more effective immune system and response to infection. This immune advantage for Africans meant a stronger defense against acute infections. However, the downside for Africans without Neanderthal genes has been the increase of autoimmune diseases, such as lupus.²⁹ Thus it seems that the interbreeding of the ancient Homo sapiens of Europe with the Neanderthals resulted in

²⁴ Nicholas St. Fleur, “Starting Fires to Unearth How Neanderthals Made Glue,” *New York Times: Science*, Sept. 7, 2017, reporting from the journal *Scientific Report*.

²⁵ Johannes Krause et al., “The Derived FOXP2 Variant of Modern Humans Was Shared with Neanderthals,” *Current Biology* 17 (Nov. 6, 2007): 1908–1912.

²⁶ Based on the findings of an international research group in Bonn University, Germany. See, <https://www.uni-bonn.de/Press-releases/research-team-discovers-201cimmune-gene201d-in-neanderthals>.

²⁷ Mooallem, “Neanderthals Were People, Too”.

²⁸ Sriram Sankararaman et al., “The Genetic Landscape of Neanderthal Ancestry in Present-Day Humans,” *Nature* 507 (March 20, 2014), 354.

²⁹ Sara Reardon, “Neanderthal DNA Affects Modern Ethnic Difference in Immune Response: Two Studies May Explain Why People of African Descent Respond More Strongly to Infection, and Are More Prone to Autoimmune Diseases,” *Nature* (Oct. 20, 2016), first published as “Neanderthal and Infection,” in *Scientific American*.

Homo sapiens possessing a genetic immune response with a lesser degree of immune overreaction.

Another genetic discovery suggests an interbreeding of *Homo sapiens* with another archaic hominid, the Denisovans.³⁰ The Denisovan species, who lived in Eurasia, shared a common ancestor with Neanderthals at some point.³¹ Denisovans also carried archaic genes of earlier non-human, non-Neanderthal hominids as well as with Neanderthals who had passed on their genes to the modern humans in Eurasia.³² The admixture of the Denisovan species near the Siberia-Chinese-Mongolia border with Asian *Homo sapiens* roughly 50,000 years ago reveals evidence of the genetic variance of *Homo sapiens*.³³ The genome contribution of Denisovan to the present-day Melanesians has been 4 to 6 percent, suggesting they may have been more widespread in Asia than previously thought.³⁴

The claim of common ancestry with Denisovans is compatible with their gene flow from Neanderthals to modern humans. The variation in modern human genes and gene flow, particularly among Europeans and Asians, has to do with the diversity in the interbreeding with *at least* two archaic hominid populations, namely Neanderthal and Denisovans.³⁵ This common ancestry among the Denisovans, Neanderthals and modern humans means that at some point in the bottleneck of evolution, the three groups were separated and went into genetic drift.³⁶ Besides all of the genetic evidence, it is fair to say logically that if all of the hominid species were able to interbreed, then their fertility mechanisms do actually come from a single lineage somewhere in the past.

Surprising genetic evidence has also surfaced which points to a mating between Neanderthal and Denisovan.³⁷ Genetic analysis of a 90,000-year-old bone from a female hominid revealed that her mother was a Neanderthal and her father a Denisovan, a previously unknown hybrid. Thus, with the advancement of genetic studies one can learn more about the generations of hybrids between the Neanderthal, Denisovan, *Homo sapiens*, as well as other human branches, and can lead us to wonder how such interbreeding may have ultimately influenced the cognitive development of *Homo sapiens*

³⁰ Ewen Callaway, "Mystery Humans Spiced up Ancients' Sex Lives," *Nature* (Nov. 19, 2013), accessed Jan. 3, 2016. <https://www.nature.com/news/mystery-humans-spiced-up-ancients-sex-lives-1.14196>.

³¹ See Katherine Harmon, "New DNA Analysis Shows Ancient Humans Interbred with Denisovans," *Scientific American*, Aug. 30, 2012, 1–4, accessed Jan. 3, 2016.

³² Pääbo, *Neanderthal Man*, 242–251.

³³ *Ibid.*, 235–250.

³⁴ Reich et al., "Genetic history of an Archaic Hominin Group from Denisova Cave in Siberia," 1056.

³⁵ Supplementary Information, "Map of Neanderthal Ancestry: Supporting Information," na. 15, 2014, 10, 90, DOI: 10.1038/Nature.12961. Inuit of Greenland and their tolerance of severe cold weather has a genetic reason: they share the same gene variant with Denisovans related to fat distribution and fat metabolism. See Steph Yin, "Cold Tolerance Among Inuit May Come from Extinct Human Relatives," *New York Times: Science*, Dec. 23, 2016.

³⁶ Reich et al., "Genetic History of an Archaic Hominin Group from Denisova Cave in Siberia," 1055, 1059.

³⁷ Carl Zimmer, "A Blended Family: Her Mother Was Neanderthal, Her Father Something Else Entirely," *New York Times: Science*, Aug. 22, 2018, the actual study was published in *Nature* magazine.

Thus, besides the physiological genetic influences from interbreeding, there is also the question of the possible genetic influence on psychiatric conditions. As the genetic bases of certain or all disorders become fully known, it may be possible that the genetic roots of certain disorders could be traced back to the *Homo sapiens* branch, or the Neanderthal branch, and could point to the effects of interbreeding. The vast topic of psychiatric disorders is yet another open-ended human medical condition that requires deeper research in the distant genetic past and the genetic influences (even in the psychological realm) of interbreeding among archaic hominids – all of which may sway our studies of modern societies and their psychological tendencies. (In this connection, it is worthy to mention atavism, which is an occasional recurrence of an archaic ancestral genetic trait stored in DNA such as tails in humans, at times quite remote from the evolutionary past.)

A Neurological Leap

Apart from the physical and tangible changes in the human constitution over the years of evolution, the research also points to the development of higher functions of the brain. In order to understand how biology and evolution may have contributed to the human inclination to think, imagine, and even to construct myths and develop particular religious or philosophical predilections, it is important to look specifically at the path of development of the human brain.

From fossil records, it is clear that for a very long time, the size of the human brain has not changed. But perhaps its function has.³⁸ The size of the skull and brain of *Homo sapiens* has remained stable for the last 100,000 years, and yet at a juncture about 10,000–15,000 years ago, some important shifts occurred. The function of the brain drove psychological shifts, especially in those who settled in agricultural societies with social cooperation and new brain wiring. Greater intellectual resources began to emerge for advanced tool-making as well as music, art, abstract thinking, and much more. These developments suggest a rather curious leap in sudden advancement.³⁹ Humans obviously evolved to more refined and sophisticated levels of cognitive function than other primates, and in the case of humans, it is significant to emphasize the *function* of the brain beyond an emphasis on morphology or the size of the brain. So what were some of these factors that influenced the development of human brain function?

One factor that may have had a substantial effect on human cognitive evolution, sending it in a different direction than other primates, was proposed by the anthropologist Richard Wrangham, who suggests that the power of controlled fire and consequently eating cooked food brought unprecedented benefits to human cognitive development. In his groundbreaking book *Catching Fire: How Cooking Made Us Human*, Wrangham has theorized that eating cooked food as opposed to raw food induced an enormous shift in human evolution because of new brain

³⁸ Though different brain sizes in modern humans have been reported, it is perhaps more of an exception than the rule, or it is of a curious matter to be researched in the future. For example, the famous French writer Anatole France had a brain capacity of slightly over 1,000 cc. See Montagu, *Man: His First Million Years*, 58–59, 60, 66.

³⁹ V. S. Ramachandran, “Mirror Neurons and Imitation Learning as the Driving Force Behind ‘the Great Leap Forward’ in Human Evolution,” *Edge* (2000), 1, www.edge.org/3rd_culture/ramachandran/ramachandran_p1.html.

performance and changes in physiology and intellectual capacity.⁴⁰ Chewing raw meat and vegetables took much longer and took more energy while providing less energy than eating them cooked. After the advent of harnessing fire by *Homo erectus*, the *Homo sapiens* exploited fire for cooking. Thus, more physiological change occurred in a shorter time than in the long history of eating raw food, especially raw meat. In eating cooked food, humans chewed less, extracted immediate sugar and more calories for hungry neurons, and developed a quicker brain as the chewing jaws got smaller.⁴¹ In the case of omnivorous humans, the energy to digest all of the uncooked food was conserved with cooking, and the cooked food provided the body and the sugar-consuming brain with a more efficient energy cycle. The evolution of the brain from *Homo erectus* to *Homo heidelbergensis* was due to improved dietary quality and cooking.⁴² As a consequence of this dynamic course of events, the dramatic change in human physiology with more readily available energy for the brain enhanced the human brain, making it more and more efficient, with digestive organs becoming smaller over the course of evolutionary time.⁴³

The connection between brain function and more readily available food energy can also be viewed against the background of the rise of agriculture in the last 10,000 years, and the availability of sugar-rich grain providing immediate calories for the brain. Genetics were playing a role at the same time: The arrival of Near Eastern farmers in Europe about 7,000 to 9,000 years ago not only brought agriculture to the continent, but it seems that also the DNA of those who arrived from the Near East affected the DNA of ancient European populations.⁴⁴ DNA analysis has shown that with the arrival of agriculture in Europe came various physical changes, all through mutation and natural selection.⁴⁵

Thus, the effects of being able to cook food can be linked with having more energy for the brain, saving time in mastication, and increasing the efficiency of metabolism, all of which enhanced brain function and changed human destiny. For eons, the harnessing of fire by *Homo erectus* and its transfer to our human ancestor resulted in the discovery and savoring of cooking. Fire thus not only kept the body warm in the coldest temperatures and kept the predators away at night as Wrangham puts it, the discovery of fire also became part of human biology.⁴⁶

⁴⁰ Richard Wrangham, *Catching Fire: How Cooking Made Us Human* (New York: Basic Books, 2009).

⁴¹ See Carl Zimmer, "Unappetizing Experiment Explores Tools' Role in Humans' Bigger Brains," *New York Times: Science*, March 9, 2016.

⁴² Wrangham, *Catching Fire*, 114.

⁴³ Professor of journalism at University of California, Berkeley, Michael Pollan has written numerous interesting books on food among which is Pollan, *Cooked: A Natural History of Transformation* (New York: Penguin Press, 2013), 6–7, 56–57, 60 quoting R. Wrangham.

⁴⁴ Carl Zimmer, "DNA Deciphers Roots of Modern Europeans," *New York Times: Science*, June 10, 2015.

⁴⁵ Carl Zimmer, "Agriculture Linked to DNA Changes in Ancient Europe," *New York Times: Science*, Nov. 23, 2015.

⁴⁶ Pollan, *Cooked*, 110, quoting Wrangham.

But the question about the cognitive leap remains: what caused the human psychological revolution leading to innovative thinking, truth-seeking, myth-making, and other complex and debatable cognitive activities?

Social life in the Neolithic era brought with it unprecedented cooperation and craftsmanship that was passed down to later generations through the power of the human brain and the capacity of its imitating neurons. This cognitive leap points to the existence of mirror neurons, as proposed by Giacomo Rizzolatti and V. S. Ramachandran. The presence of cumulative mirror neurons in the primate world means learning occurred through imitation. In humans, their powerful mirror neurons showed readiness for higher cognitive function. The power of imitating others and performing repetitive actions are the work of same set of neuronal activities – both when we see them and think of them. These neurons – known as mirror neurons according to research on human brain waves (EEG) – are seemingly responsible for a great leap forward in human evolution.⁴⁷ Such imitation seems to have had a neurological effect on two critical aspects of brain function: empathy and the sense of otherness or selflessness – in other words, seeing oneself in others and others in oneself. This development of the perception of self and relationships with the world arose through imitation and the work of mirror neurons.

The phenomenon of imitation made daily life more effortless with less critical thinking on a certain level, especially for a brain that has larger and other pressing tasks to attend to. Ramachandran encourages further enquiry into how this consequential change in human cognition happened in such a short time. The leap forward took a more concrete shape but we are yet to confirm how much the mirror neurons were responsible for it.⁴⁸

The theory of mirror neurons alone cannot fully explain the Neolithic cognitive leap forward in such a short time, because earlier Paleolithic populations with their artistic and tool-making skills also possessed mirror neurons. The Neolithic leap forward was a combination of using mirror neurons in agricultural societies, social cooperation, a division of labor, and grain as part of their diet, which provided a readily available sugar to be used by the brain for more precise function. In general, the agricultural revolution prompted a larger population because of the new mode of attaining food. Agriculture provided more time for some people in newly emerging, more sedentary population centers, particularly those people in new positions of power. It began to develop features of urban civilization – an unprecedented multitasking talent among human beings. The imitation of complex tasks during urban settlement made the leap forward more effective. Thus, the power of mirror neurons helped emerging civilizations to utilize these neurons as a tool of imitation and cumulatively, a “leap forward” with all of its pros and cons.

⁴⁷ Research was also carried out on monkeys. Giacomo Rizzolatti, Luciano Fadiga, Leonardo Fogassi, and Vittorio Gallese, “From Mirror Neurons to Imitation: Facts and Speculations,” in *Imitative Mind: Development, Evolution and Brain Bases*, ed. Andrew N. Meltzoff and Wolfgang Prinz (Cambridge: Cambridge University Press, 2002), 247; see also Ramachandran, “Mirror Neurons and Imitation,” 3.

⁴⁸ Ramachandran, “Mirror Neurons and Imitation,” 5.

In sum, agility of thinking was certainly easier for a well-rested, well-fed brain than for an exhausted, sleep-deprived, energy-deprived brain. In addition, observation and imitation of others through the work of mirror neurons probably contributed to an expanded range of human thought and awareness. Various interdisciplinary areas of research on additional potentially contributing factors such as minute shifts in physiology and body temperature, the impact of atmospheric pressure and climate change on the function of body and mind, and the role of micronutrients in slightly upgrading metabolic pathways are areas for further research that could bring us closer to deciphering the developmental stages of human cognitive evolution.

The Enigma of Cognitive Evolution: Reason and Lapse of Reason

Human evolution was driven by genetic and environmental factors, as we have seen. Evolution was based on survival in the face of competition for food, territory, mates, and avoiding predators in harsh and dangerous environments. In other words, the survival of our early ancestors required domination over the physical challenges that they faced for millennia, just as all animal species have survived through adaptation or domination. In fact, human beings as hunter-gatherers perhaps saw not much difference between themselves and other animals; it was only in the Neolithic period that a rupture and modification in this attitude emerged.⁴⁹ Later human ancestors, in seeking superiority over nature, faced battles of domination over larger territories for hunting as well as dominion over the land through the harnessing of agriculture.

Gradually, however, as human societies began to emerge with more structure, there was a slow but steady transition to domination over each other. On one level, this meant domination over other human populations to control the labor needed to run an agricultural society. But the most dramatic evolving battle in the panorama of human evolution was the struggle for the *domination of the human mind*. Gradually, small groups of people began to exercise authority over larger groups of people, dominating how people thought by harnessing the human tendency of a survivalist herd-style of thinking. A “herd mentality” kept everyone together as a group, mentally speaking. As social power structures developed, the manipulation of this herd-like tendency resulted in a form of mental domestication very similar to the domestication of animals that accompanied the rise of agriculture.

The sedentary early city-state systems basically “domesticated” humans in their social structures and in some ways kept the hunter-gatherers out of their “civilized” systems. Subduing through domestication did not necessarily happen among hunter-gatherers since they lacked hierarchical and highly structured communities. While hunter-gatherer groups may have had group elders, they had no need to control large populations and seem to have been much more egalitarian.⁵⁰ Domestication of humans in the early agrarian societies was intended to produce “herds” who would uncritically follow common beliefs. The leap forward also brought with it anxieties,

⁴⁹ This claim is from Jean-Denis Vigne of CNRS-Paris in a lecture, published Dec., 14, 2017 in Youtube: https://www.youtube.com/watch?v=5o1JZ5wo_Qs

⁵⁰ For a well-rounded and detailed discussion about the taboo of civilization versus the legacy of forgotten hunter-gatherers, see Scott, *Against the Grain*, especially 87–92.

inequalities, slavery, genocide, discrimination, armies, tax-collector, empire, and cruelty, to the degree that using the word “progress” to describe civilization could be controversial.⁵¹

The Paleolithic way of life of small bands of hunter-gatherers without land, without livestock, and without sociocultural bonding was slowly displaced by an agricultural, sedentary lifestyle that would not have survived in the face of nonconformity, lawlessness,⁵² or independent thoughts and beliefs. Domestication of plants, animals,⁵³ and humans went hand in hand in order to keep the embryonic agriculturalist societies together. This human domestication was carried out through the formation of culture, common beliefs, and common codes of conduct and guidelines for conformity. In this domestication process, human behavior and the routine timetable for various activities for those who lived in the agricultural societies were codified and framed (even in the religious scriptures).⁵⁴

We can imagine that through the process of beginning to live side by side in more crowded conditions in these emerging sedentary communities, the disparities in the psychic makeup of people would have become more apparent. Perhaps interpersonal and unavoidable frictions arose more easily and often, and these cognitive differences and variations in mental inclination hinted at future intellectual conflicts in the most urbanized communities. It also seems that the angst-ridden, fearful mindset became more common than the less fearful mind.

The foundation of mental domination was the part of domestication that came more directly from cognitive and social evolution. This process of mental domination corroborated existential fears and metaphysical curiosities about the world. Due to their own curiosity and supported by the impetus of domination, early “metaphysicians” and tribal leaders conceived stories that explained how earthly and celestial affairs were controlled and operated by mighty god-heroes as well as stories about creation and life and what comes after life. Of course, due to cognitive diversity, even within each tribe there were those who opposed or resisted such mythical fabrications, mental domination, and religious rituals or blood sacrifice for the hero-gods or kings, and remained in the shadow of their own communities.

⁵¹ See John Lanchester, “The Case Against Civilization: Did Our Hunter-Gatherer Ancestors Have It Better,” *The New Yorker*, Sept. 18, 2017. This article is based on the premise of Scott’s *Against the Grain*.

⁵² James Gorman, “Prehistoric Massacre Hints at War Among Hunter-Gatherers,” *New York Times: Science*, Jan. 20, 2016. In pre-Neolithic times, as evidenced in the tens of discovered skeletons near Lake Turkana in Kenya, reveal devastating wounds inflicted by arrows and spears on one another. The atrocious violence committed against a pregnant woman (with a fetal skeleton in her abdomen) and other defenseless victims as corroborated by the well-preserved skeletons demonstrate the mayhem of living in the wilderness.

⁵³ Before the domestication of other animals, humans had the longest experience with dogs during their days as hunter-gatherers. Dogs had proved useful as loyal friends, scavengers eating the left-over food, and guard animals warning against approaching danger. The human and dog bond goes back in time, perhaps between 15,000 to 30,000 years ago. See James Gorman, “The Big Search to Find Out Where Dogs Come From,” *New York Times: Science*, Jan. 18, 2016. See also Marie-Pierre Horard-Herbin, Anne Tresset, and Jean-Denis Vigne, “Domestication and Uses of the Dog in Western Europe from the Paleolithic to the Iron Age,” *Animal Frontiers*, 4/3 (2014): 23–31. Cats were domesticated much later during the agricultural and storing food period when barns and sheds were overrun by rodents.

⁵⁴ Scott, *Against the Grain*, 88–92.

The question is, why would large populations of people allow a small number of elites to dominate them, particularly through irrational stories about the supernatural? To answer this question is certainly more complex than simply assuming humans possess a herd mentality and blindly imitate. Kent Baily in his study of paleopsychology proposed that the true nature of human beings is undefined, and the perception of humans being one thing or another is elusive. The human inclination is to go back and forth – regression-progression. This primate tendency of herd-imitation became a characteristic in agriculturalist communities. Therefore, “animalness” and rational “humanness,” Baily argues, have their place in social life as being rooted in both the evolutionary process and the drive of natural selection.⁵⁵ Regarding capricious human inclinations, Konrad Lorenz also believes that war, for example is not in our nature but rather aggression is circumstantial and part of our animal instinct.⁵⁶ However, the oscillation of humans and choosing between animal-herd and thinking may be due to a survival strategy. Baily’s point about our indefinable mental state may be considered valid in the general sense. Yet, the dilemma and the paradox are when those fixated in the herd behavior of the ancestral systems have difficulty understanding, respecting, and even coexisting with those who do not wish to imitate and follow the beliefs of others, and would prefer to maintain their intellectual independence.

Conclusion

The complexity of human evolution and its cognitive trajectories will continue to be a great part of scientific research during this century. What is important to remember is the fact that the evolution of the human species is no longer an abstract theory – not only hominid fossil records but also the genetic analysis of humans and other apes demonstrate a common ancestry. DNA is a sort of evolutionary black box of genetic information about shared and common ancestors, information that has changed our perspective of natural history. Only mutations set us apart from other human species and high primates. This fact leads us to consider that humans evolved to be both an abrasive domineering primate with an alpha male leader, as well as a primate with a gentle, compassionate, altruistic side.

In the course of the evolutionary process, we humans have gone through many biological changes and environmental and societal adaptations. By becoming conscious of our own psychological evolution and knowing how much we have inherited and follow ancestral metaphysical ideas, myths, and beliefs in a herd-like manner, we can then reflect more deeply to resist and prevent human-human domination. The particular form of mental domination through so-called common beliefs and common identity is the most prevalent one.

The next chapter will provide some biological clues as to how counterintuitive thinking as well as fear and mystery in the human mind played a role in the formation of religion, thus limiting

⁵⁵ Kent Baily, *Human Paleopsychology: Applications to Aggression and Pathological Processes* (Hillsdale, NJ: Lawrence Erlbaum Associates, Inc., 1987), 2–5.

⁵⁶ Lorenz, *The Waning of Humaneness*, 158.

the mind from seeing clearly the fundamental laws that govern the natural world. The cognitive leap forward also brought with it a lapse.

Chapter 2

The Cognitive and Biological Foundations of Religion: Terror Management

From the time the brain of *Homo sapiens* became self-aware, existence has seemed challenging on multiple cognitive levels. The world's impersonal, speechless character and harsh natural events must have been the source of much anxiety for our ancestors. Confusion was entangled with the anxiety of existence.

Over time, the enigmatic world was given meaning by our earliest human ancestors. They anthropomorphized the world, explaining it using human speech that others could grasp and would then perhaps feel less anguished. Many such explanations gradually evolved to become myths and religions, stories that were told to appease fear, to satisfy the curiosity about the mysteries of life, and to provide some sort of meaningful direction for people to draw upon for living and dying.

Myth and religion and its written propagation played a role of keeping emotions, and even one's own thinking, at bay, almost like a form of defense against internal predators. Other animal species have defenses such as camouflage, long claws, clever mimicry, or sharp teeth. The human defense is the ability to make up stories against those inner demons of fear, hope and emotionality.⁵⁷

The emotional reasons for the emergence of religion seem justifiable. But was there something else going on for our ancestors? Religion appears to be a basic need so fundamental to human existence that a biological explanation may help us to better understand the roots of mythology and religion, and today we know there is indeed a biological and cognitive component involved in the development of religious thinking. It is important to note that this chapter is not intended to take away the joy and support that many derive from religious thinking. Rather it is to explore the various causes that led to the diversion of the human mind, pulling it away from a life lived according to the natural biological rules of physical existence and instead turning to a "hyper-mentalized" construction of reality created through the conceptualization of religion.

In earlier times, religion was given a place on a pedestal in societies and was never questioned, as it was thought to be the testimony of truth, an untouchable subject. But today, religion is being studied methodically in terms of the workings of the brain. Various empirical studies conclude

⁵⁷ Gregory M. Nixon, "Myth and Mind: The Origin of Human Consciousness in the Discovery of the Sacred," *Journal of Consciousness Exploration and Research*, 1/3 (2010), 24–25, 31, 38–39.

that religion was an evolutionary invention, a cognitive tool for meeting psychological, emotional, social, and intellectual needs.⁵⁸ The supporting point here is that there is a biological basis for religion in which the frontal lobe, dopamine, and cognitive rewiring of the mind play their respective roles. It seems that fear and curiosity were the triggers of an adaptive biology.

It is obvious, and yet important, to remember that religions are not part of the natural setting; they only exist in peoples' minds. The Cognitive Science of Religion (CSR) is a field of study that in the last two decades has tried to explain how the brain, by resorting to gods and other supernatural explanations, relieved itself of inner tension. Looking back, it may not have been completely an irrational process.⁵⁹ This theory of whether religion historically was a rational or irrational choice has been debated.⁶⁰

CSR has been looking into how the human mind tends to locate "agents" for everything in nature and how childhood indoctrination turns the mind into a storytelling instrument. Out of repetition and conviction, conditioned minds easily claim the realness of their gods. The narrative of religion is often so engraved in the mind that it becomes difficult although not impossible to get it out of one's head. But because religions have no physical presence in nature, the whole premise of one religion can easily be overturned by the members of another group, whether through occupation of territory, the revolution of one sect against another, the replacement of the old religion by either a new one, or by choosing another set of beliefs. It has been made clear that all extinct and surviving religions, without exception, made spectacular claims without providing any hard material proof for the veracity of their religion. Perhaps due to this and other strategic factors, humans have been able to shift from one religion to another and consequently change the rewiring of their brains.

As for our archaic ancestors, answers to the many riddles of nature were unknown. In their fear and creativity, they produced metaphysical scenarios which stressed and gullible people often believed. Fear also subjugated them to the earthly and celestial authorities for mercy. In becoming obedient and faithful, it has been mostly a matter of following one's impulse of fear, emotional state, cultural imprinting and social-cognitive strategies.

The analysis that follows examines the inevitability of the rise of religion in the context of evolutionary biology, as a biological response to the general human need for mental and emotional stability. It also assesses factors in the rise of religion without assuming that such factors were absolute. It is important to bear in mind that all past cultures were finite and transitory, therefore their rationality and irrationality were relative to one another and the needs of their time. There is no absolute form of religion and culture. Thus, the non-absoluteness of

⁵⁸ Todd Tremplin, *Minds and Gods: The Cognitive Foundations of Religion* (New York: Oxford University Press, 2006), 197–198.

⁵⁹ Joshua C. Thurow, "Does Cognitive Science Show Belief in God to be Irrational? The Epistemic Consequences of the Cognitive Science of Religion," *International Journal for Philosophy of Religion*, 74/1 (2013), 77–98.

⁶⁰ Hans Van Eyghen, "Religious Belief is Not Natural. Why Cognitive Science of Religion Does Not Show That Religious Belief is Rational," *Studia Humana* 4/4 (2016), 34–44.

past and present religions and cultures reminds us to claim things only to a certain limit and to leave the rest to the next generation who can build on others' research with more perspective.

1. The Enigma of Human Cognition and “Hidden” Agents

To understand ourselves and our religiously-minded ancestors, we need to grasp a tenet central to cognitive science: before understanding *what* we think, we must understand *how* we think. How we think owes its biological processes (brain rewiring) to the past workings of the brains of our ancestors. Over the course of biological and cultural evolution, humans have cultivated “cognitive modules.” The presence of these modules in the brain is the basis for a child in any culture to be able to learn and adapt to an environment of religious beliefs and dogma – the same is true for learning a native tongue, for example. These cognitive modules, whether they are sets of imaginary-religious ideas or practical ideas that have been used as tools to counter the pressure of survival, have persisted to our time.⁶¹

The intricate operations of the brain, particularly in the frontal cortex, result in skills, refined thinking, and ultimately the development of the habits and beliefs of culture and religion.⁶² The reason behind the cognitive modules is physiological, but how these modules can be used and adjusted may be the work of personal intention and intellectual faculties. In other words, the growth and continuity of culture and religion have been the work of brain modules rather than the result of pure sociological causes. Sociological causes are primarily the result of how our brain has been trained to think, behave, and react. So, the implication here is that the sociological influences come later, after the cognitive modules have been established during childhood.

Due to childhood learning and the formation of cognitive modules, there is the human tendency to protect one's belief, especially when it is supported and believed by others around them. Thus, when a particular belief is in place, it is hard to discredit it because there is rarely a tendency to think one's theory is false, and in fact, contradictory evidence is often ignored.⁶³

The concept of agency plays a critical role in the development of religious thinking. The term *agent* in cognitive science is used to describe a non-detectable entity in causal reality. Agents are not objects but are features such as noise, wind, ambiguous information, hidden relations, and formless phenomena that are not easily detectable by the mind but which mental interpretation links with causal reality. Queries in the cognitive science of religion are aimed at what compelled our ancestors to think of gods, ghosts, and other invisible agents. Neurocognitive science has a significant interest in understanding the inner workings of the brain and how and why it conceives of invisible agents as the basis of religion and religious thinking.

This is why it is important in this context to again consider *how* we think, not just *what* we think. From the moment of self-awareness and tool-making, humans began to think in a “tool-making”

⁶¹ Tremlin, *Minds and Gods*, 7, 15, 57.

⁶² Maria Montessori calls this “spiritual territory,” and she has a drawing of a toddler-age child sitting on the floor with two antennae picking up all the “waves” around her – language, religion, culture, and much more.

⁶³ Frey, “Cognitive Foundations of Religiosity,” 232.

mindset: everything in the world is a “tool” and therefore must have a “maker.” At that point, it certainly never occurred to them that in the natural world and in the cosmos there are processes and laws of transformation via the natural mechanisms of change or that things are not created or made by an agent at every turn. The formation of all things is in fact the result of processes. But from the inexperienced anthropocentric and tool-making perspective of our human ancestors, things and events could not have come into existence simply by themselves without a specific agent. From this perspective, animals, forests, the rain, thunder, earthquakes, and all aspects in the theater of existence must have had a maker and operator. The notion of *process* was unknown to them. This agent mindset continued in different forms over time and was certainly not limited just to our prehistoric ancestors. It reached fruition in the nineteenth century with the famous “watchmaker” claim of the British theologian William Paley (1743–1805), when he put forward the proposal that the intricate creation of nature, adaptation, and fitness cannot happen by itself; there must be a “watchmaker”⁶⁴ behind it all. Paley’s clever analogy of a watchmaker was inspired by an aboriginal who found a watch and having never seen one before, curiously asked about its function, who made it, and why. Thus, Paley’s overarching thought that there must be a watchmaker/creator⁶⁵ somewhere, sometime.

Paley’s “watchmaker” and similarly anthropocentric notions of a creator were referring to a god or gods who patiently designed stars, galaxies, mountains, oceans, bacteria, frogs, vultures, trees, and all of the other 250 million species on earth for a particular purpose.⁶⁶ This clever argument in regards to the theory of creation certainly continues to be claimed by religious followers who believe in an intentional design by a creator rather than a pure mechanism of *process* of change and evolution through the laws of nature that move the species forward and are irreversible.⁶⁷

And so, although it may sound simplistic, the anthropomorphism of gods along with the idea that everything has an agent has been fundamentally based on humans’ tool-making mindset. This was palatable and familiar to the inner workings of the minds of our ancestors within their cognitive environment. It was a successful strategy used by the human mind as a template to conceptualize supernatural prototypes and gods.

Ulrich Frey provides insight into the cognitive foundations of religiosity. Frey explains that it is easier for the mind to make correlations among patterns of events by the “hidden agents”

⁶⁴ The “watchmaker” metaphor goes back to the theologian and philosopher, Samuel Clarke (1675-1729). See “Samuel Clarke,” <https://plato.stanford.edu/entries/clarke/>. Samuel Clarke had tried to prove the existence of god by the mathematical methods, using Newtonian mathematics – “it was said that no one had doubted God’s existence until he had tried to prove it.” See Anthony Pagden, *The Enlightenment and Why It Still Matters* (Oxford: Oxford University Press, 2015), 105.

⁶⁵ In response to the religious concept of the “watchmaker,” the evolutionary biologist Richard Dawkins was prompted to write his book, *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design* (1987; New York: W. W. Norton and Company, 2015).

⁶⁶ Paley (a creationist) ironically inspired Charles Darwin to adopt the scientific terms “adaptation” and “fitness.” See Wolfgang Achtner, “The Evolution of Evolutionary Theories of Religion,” in E. Voland and W. Schiefenhövel (eds.) *The Biological Evolution of Religious Mind and Behavior* (Berlin, Heidelberg: Springer Verlag 2009), 264.

⁶⁷ See Lorenz, *The Waning of Humaneness*, 35, 53.

operating the world, calling them “illusionary correlations.”⁶⁸ In regards to such perceived agencies and plans, Frey asserts, it is a causal error to imagine such correlations, whereas in fact there are no patterns to be found other than what is knowable so far. In pre-scientific times and even in non-literate traditional communities of today, people maintain their knowledge of the world by correlating external stimuli- in the case of religion, correlating gods as the active agents- with their internal cognitive interpretation of them.

Frey provides additional insight into the cognitive foundations of religiosity. He describes three intuitive forms of traditional knowledge stemming from the beliefs that there are always actors and certain intention behind the events and movements in the familiar world. These relate to 1) the awareness and existence of living beings (“folks-biology”), 2) the motion of physical objects (“folks-physics”), and 3) the mental states of other people and their interpretation as well as the analysis of the inner worlds of others (“folks-psychology”). For example, the movement of the moon and sun, or objects falling to the ground, are believed to be possible only by the intention of an *actor*; they cannot just happen on their own.⁶⁹ In the same mindset, the earth was believed to be flat and it was certainly impossible to imagine it round and floating in space without anything to hold it up. This type of “physics” persisted for a long time due to a rigid anthropocentric interpretation of reality, combined with the need to relate everything to the visible physical reality, where things do not “float” unsupported, for example, so the earth must have something holding it up.

For our archaic ancestors to come up with the idea of external agents or invisible actors, they needed to depend on the workings of their brain in the most intelligent way they could. They used cognitive tools to conceptualize the world and its events. The cognitive science of religion has tried to identify and understand the mechanisms of the highest abstract mental tools.

One such mental tool, which is responsible for many beliefs and behavior and the designation of imaginary agencies, is called Agency Detective Device (ADD). It works in combination with another mental tool called the Theory of Mind Mechanism (ToMM).⁷⁰ In his study *Minds and Gods*, Todd Tremlin proposes a series of interesting insights on how the Theory of Mind Mechanism, the appearance of gods in human culture, and the brain, are all interrelated in the creation of religion. In order to make sense out of the movements, phenomena, and gestures of the world, humans imposed (or rather superimposed) their *own* minds on gods as invisible agents who created the world and went on to operate it. These gods (invisible agents) were perceived to have minds, feelings, anger, and intentions resembling those that human beings possess. Thus, religion became the way that humans thought of gods.⁷¹ It was as though knowing the minds of others (and by extension, the minds of the gods) became a means to read the underlying reasons

⁶⁸ Ulrich Frey, “Cognitive Foundations of Religiosity,” in Voland and Schiefenhövel (eds.), *The Biological Evolution of Religious Mind and Behavior*, 231–232.

⁶⁹ *Ibid.*, 229–230; see also, Tremlin, *Minds and Gods*, 66–68.

⁷⁰ Tremlin, *Minds and Gods*, 76–79, 80.

⁷¹ *Ibid.*, 80, 81–83, 86–87.

for the existence of nature and its events. Humans made nature and natural processes, like the interactions of gasses, elements, moisture, pressure, the making and unmaking as the working of gods. The primary difference between gods and humans was only that the gods knew more than humans.⁷²

Archaic ancestors were under psychological pressure and needed to see the non-visible actions of nature and the sky as the *actors* or agents of the world, and this resulted in the creation of a cognitive bias and eventually a cognitive habit. It was a yearning to anthropocentrically perceive the world in a way that would fit the everyday experience of the informal mind. Thus, the best the human ancestors could do was make the world explainable to themselves, and these explanations gradually became the basis of the evolution of religion.

Many remarkable, ferocious and dramatic things have been attributed to gods, ranging from creating a beautiful world to inflicting punishment, triggering natural disasters, giving incurable illnesses to people, and neglecting mentally ill people. In fact, god was itself seen as the source of mental illness in the “cursed” people. These religious beliefs certainly have a neurocognitive underpinning in the belief that there is always an agent behind all events of life.⁷³ What is interesting is that these invisible agents possess human tendencies, particularly the tendency to reward friends and punish enemies. This cognitive predisposition for conceiving intentional agents behind unexplained natural events also paved the way for more complex religious and esoteric beliefs. These agents ranged from supernatural bodies and ghosts to ancestors, fairy entities, and gods.⁷⁴ The same mindset of agency invented angels and demons too which made religion a reality in human cultures.

Monotheism over the last three thousand years has anthropomorphically depicted a god involved in an ongoing battle against evil. It was in the formative period of monotheism that god took a strong and harsh stance against sinners who followed the bad god (the devil) by inflicting severe punishment on them. In the ferocious battles of this god, as it is claimed in the monotheistic scriptures, god revolts against and even destroys the natural world of his own creation by sending floods, earthquakes, and volcanoes. This was signaling to humans who the mighty god is and what he is capable of doing. The nature of god, in the evolution of monotheism, remains the same. He still punishes and shall punish (at the end of time) those who are in breach of his covenants.

The commonality of cognition in perceiving gods, and the similarities among many traditions found around the world, is an indication of the commonality of the inner workings of the mind,⁷⁵

⁷² Ibid., 99, 102, 104, 186.

⁷³ Martin Brüne, “On Shared Psychological Mechanisms of Religiousness and Delusional Beliefs,” in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 217, 218, 226. A recent report reveals that a large percentage of schizophrenic patients attributed their illness to being either a test or punishment by God.

⁷⁴ Rebekah A. Richert and Erin I. Smith, “Cognitive Foundations in the Development of a Religious Mind,” in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 181–182, 187, 192.

⁷⁵ Tremlin, *Minds and Gods*, 75, 87.

and consequently the commonality of human cognition and biology. On the broader and pyramidal level, typical human psychology and cognition determines the culture of religion, biology determines psychology, and biology itself is determined by natural selection. By this successive progression, it can be concluded that conceptions of religions and beliefs in gods emerge out of a biological impetus. The emergence of religion is because of the activities of the brain rather than theological reasons. It is rather a “pancultural phenomenon” which must have a common biological basis.⁷⁶

Religion is thus a learned biological strategy to tackle emotional turbulence, fear, mental frailty, and other psychological vulnerabilities or emotional needs. Although the neurological links between emotions, cognition, and religious concepts have been argued in the context of neurotheology, the ideal existential state or enhanced-fitness can only be reached through the mechanism of our neurobiology.⁷⁷ The neurobiological mechanism decides the ideal options, and for our ancestors, the conception of the supernatural and religion was perhaps their best option. So, it can be said that despite religions’ unrealistic claims, they were (are) the mental tools needed by some to reach their ideal state, without completely compromising their entire cognitive faculties.

The implementation of a cognitive strategy is based on past adaptation and memory. In this case, religion is taught and remembered as being useful. This cognitive modularity is called computational modularity by evolutionary psychologists, referring to recalled knowledge operating at both universal and local adaptation levels. In this way, the continuity of religion is justified cognitively, even though the computation contains irrational knowledge.⁷⁸

This strategic behavior related to irrational knowledge is not fixed; it can be altered should the individual choose to pursue an alternative rational knowledge outside the group. A new cognitive initiative, stepping out of the old mode of ancestral-religious thinking, would require a new system of creative, non-modular planning and organizing. Thus, the strategy of adaptation on the individual level can involve combinations of familiar and new beliefs and practices, such as the use of old cultural channels along with newly conceived intellectual options. An individual may choose to pursue both the programmed modular (religious) and the new non-modular (creative thinking) systems. At times, one may even use one system to prove or discredit the other to oneself. Even though this cognitive quarrel is complex and exhausting, it is more sophisticated due to acknowledging the existence of a counterargument. The key thing in this modern quarrel is to maintain an open and dynamic intellect, rather than stagnation from not pursuing anything outside of one’s monolithic dogma.⁷⁹ Given the global dialogues on religions and debates about science and religion in our era, using logic and logical justifications to prove one’s religious

⁷⁶ Ibid., 128, 132, 145–146, 157–159.

⁷⁷ Ibid., 124–126.

⁷⁸ Peter Carruthers and Andrew Chamberlain (eds.), *Evolution and the Human Mind: Modularity, Language and Meta-cognition* (Cambridge: Cambridge University Press, 2000), Introduction, 8, 10.

⁷⁹ Ibid., see especially chapter 8 by David Papineau.

beliefs and their imbedded cognitive habits produces greater dialogues than just resorting to plain and bare illogic.

2. Biochemical-Biocultural Factors in Religious Thinking

Some fascinating work has been done in the realm of biology that offers an intriguing biochemical perspective on how religion works in the mind. For example, it seems that intrinsically higher levels of dopamine can increase the intensity of religious experiences and induce an even stronger belief in god.

In neurotheology,⁸⁰ the strength of religious superstition and high levels of dopamine are correlated. Even the link between Obsessive Compulsive Disorder (OCD) and religiosity has been debated.⁸¹ The role of high dopamine levels not only in OCD but also in schizophrenic, bipolar, and epileptic cases suggest certain imagined religious experiences in these individuals. And the reverse is also evident: Harris and McNamara's studies explain that patients with Parkinson's Disease, particularly "left-onset" cases (right hemispheric impairment) with reduced dopamine production, have less tendency to religiousness compared to their healthy-age-match control counterparts.⁸² Without dopamine, the prefrontal cortex function is either diminished or becomes dysfunctional, a circumstance where social skills, planning, judgments, and even religiosity can be selectively impacted and shrunken.⁸³

While we may not be able to draw a universal conclusion that people with high levels of dopamine are more religious or more superstitious than those with normal or reduced dopamine levels, it is an area worthy of attention. But this single piece of physiological information does not necessarily produce sufficient evidence for how the masses of people throughout history have espoused or instrumentalized religion for better adaptability in nature. Definitely the combination of biological (on the level of the brain) and non-biological (namely, cultural and sociological) factors have caused religion to persist, no matter which god was put in charge each time.

This being said, Todd Tremlin states that science has been accused of stripping away the mystery, delight, and hopes that make life worth living by replacing these marvelous aspects with cold facts and calculations.⁸⁴ This is a well-taken criticism: no cold scientific facts should rip spiritual experiences apart, especially as long as people need these spiritual experiences to

⁸⁰ Although controversial, the premises of sociobiology and neurotheology argue that the social and religious mind have a biological origin more than a sociological or theological origin. Their paradigms offer some usable arguments. See Rüdiger Vaas "Gods, Gains, and Genes on the Natural Origin of Religiosity by Means of Bio-cultural Selection," in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 25–26, 28.

⁸¹ *Ibid.*, 30–34.

⁸² Erica Harris and Patrick McNamara, "Neurologic Constraints on Evolutionary Theories of Religion," in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 205, 208, 209, 212.

⁸³ *Ibid.*, 208.

⁸⁴ Tremlin, *Minds and Gods*, 199.

maintain their mental stability and health. This criticism against science, however, is true only if such spiritual experiences are personal, and do not involve public proselytizing, are not used as tools of domination, and do not distort history such as organized religion.

But the moment spirituality steps out of the personal domain involving the private relationship between a person and a deity, it becomes a public affair and therefore is subject to scrutiny, especially if the claims have a missionizing aspect to them. Thus, science takes interest in the roots and rise of *public* religious thinking but without disturbing the multitude of personal emotional-spiritual experiences of individuals. People are entitled to maintain their views even though irrational as long as their rational views are integrated in the public interest in politics, society, and even with rational scientific approaches, such as modern medicine, germ theory, genetics, evolution, geology and modern physics.

The question arises as to why, if humans invented religion in order to feel security and comfort, would they create imaginary deities that they would have to fear and obey? The immediate answer could be the biological need of a “comfort level” with needing/wanting an alpha figure to obey and fear. However, not all religions have generated fearful deities, such as large number of Native Americans, aboriginals, and Druids, whose deities were not the angry wrathful type. Interestingly all of these groups were hunter-gatherers and not agriculturalists. Thus to answer this question, the approach will have to shift from solely a biological answer towards cultural psychology as a bedrock for the development of culture of religion and religiosity. A proposition has been made by Rüdiger Vaas that the rise of religion may follow three plausible biological and cultural hypotheses: 1. Religion is the direct product of biological evolution and is adaptive; 2. Religion is a by-product of traits that are biological in nature and are adaptive; 3. Religion is exclusively a cultural by-product.

Vaas’s makes an additional proposition regarding why people believe in god, obey theologians or authorities, and believe without questioning, drawing upon three possible scenarios: 1. social imprinting from parents and groups; 2. personal experience, such as marveling at nature and reading the scriptures; 3. rational hermeneutical studies and philosophical debates. As valid as these reasons may be for individuals, Vaas says that the fact remains that even in arguing the positive utility of religion, none of these prove the existence of god or any other supernatural forces.⁸⁵ This is the central dilemma. No metaphysical claims in religion can be proven, yet massive numbers believe in them. Why? Let us briefly bring childhood and social imprinting into the discussion.

Religion Is a Childhood-Historical Encoding, Not a Delusion

Religious believers in every culture did not necessarily choose their faith freely nor have they necessarily scrutinized why they believe what they believe. Religion is given to them by their parents and their sociocultural surroundings. The bio-cognitive wiring in the brain picks up

⁸⁵ Vaas, “Gods, Gains, and Genes On the Natural Origin of Religiosity,” 37, 39, 40–42.

religion just like it picks up a native mother language – the religious themes take formative shape in the mind and in the social attitude. In fact, children themselves seem to show a certain developmental predisposition to absorb the theistic faith of their parents.

The beginning of religious cognitive behavior starts from childhood. In general, children from an early age are cognitively prepared to believe in gods or other non-human supernatural beings behind unexplained events.⁸⁶ This tells us something about the conventionality of the human mind's expectation that there is always an agent, as discussed before, that there is "someone" behind every event. The propensity of personifying everything in the world is a strategy of a quick, pre-packed understanding of reality without much reflection – a child-like approach.

Children absorb their parents' religion to continue their mental and social survival in a common culture. Children naturally memorize, imitate, and follow parents blindly in the beginning. In adolescent years and beyond, the general tendency can go in the direction of people valuing religion over reflecting about the purpose of their life and the meaning behind it. Thus, religion has remained as a substitute for and defense against emerging confusion, against thinking too much and too often. Religion can be a comfortable standby mode of being and operating. Parents often attempt to raise children in the safety of religious thinking rather than what is perceived to be wild and directionless thinking.

The impact of belief in god and religious thinking, no matter which god or religion, creates an imprinting in cognition during childhood that is hard for many to unlearn. Those who can unlearn have been able to dismantle the wiring of the old and familiar cognitive modules to creative modules and new reasoning. The very fact of this dismantlement and new cognitive wiring, as many secular and atheists have done, is itself a clue to how the old learning can be unlearned – the religious people are therefore capable of unlearning without being framed as "delusional."

The term "delusion" may be problematic and not reasonable to use for religious people as some modern authors have.⁸⁷ The condition and diagnosis of delusion has its own set of clinical criteria and verification, which is beyond the scope of our discussion here. It can be said that religious people are not delusional per se, but that clinically delusional people may have a great affinity toward fantastical and supernatural-religious ideas.

However, the condition of "delusion" is associated with someone who believes that they are themselves an agent of the supernatural whose influence could change all aspects of their life and other people's lives, as claim many self-designated messianic preachers and thinkers, although

⁸⁶ Rebekah A. Richert and Erin I. Smith, "Cognitive Foundations in the Development of a Religious Mind," in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 183–85, 187.

⁸⁷ See Richard Dawkins, *The God Delusion* (London: Bantam Press, 2006).

perhaps charlatans. This self-deceptive condition is potentially more prevalent among religious people who have the ability to deceive others.⁸⁸ That is also to say, when a religious person allows religious beliefs to assume control of their entire personality by silencing all other motivations, a neurosis is potentially in the making – and when the collective mind of a group allows such attitude, it is then an epidemic neurosis.⁸⁹

3. Religion as an Adaptive Survival Strategy

The path that led to religion was a human survival strategy on a level unknown to other animals. Having developed higher cognitive powers, such as self-awareness and reflection, human beings were not content with only eating, sleeping, reproducing, living, and dying like other animals. With the development of the frontal cortex of the brain, they found the ability to think, ruminate, wonder, and worry. The frontal lobe of the brain prioritized survival on at least two fundamental and complex levels: physical and psychological. The physical level required the combination of food, shelter, security, and comfort in the face of all natural and biological challenges. The psychological level was more intricate. The frontal lobe fabricated stories about the world not based on any external reality in nature; it was simply a “placebo” narrative of the disquiet mind as a means to psychologically survive the questions of the nature of existence. The adaptation of the strategy of religion for those whose minds strived for fitness seemed reasonable. Mental fitness in an evolutionary sense has a more complex pattern than the physical adaptation. Fitness-enhancing is an evolutionary impulse with a goal of balance and improvement.

Some have proposed that religion is the work of natural selection as part of a terror-management theory.⁹⁰ It has also been argued that religion provides certain biological kinship – an ecologically suitable behavior of selecting and supporting kin within a group.⁹¹ It is also important to remember that “altruism, compassion, empathy, love, conscience and the sense of justice – all of these things that hold society together, the things that allow our species to think so highly of itself, can now confidently be said to have a firm genetic basis.”⁹² So, it is not necessarily that religion provides virtue, trust, and morality, but that such qualities are in the set of behaviors that make survival and cooperation, (or even a higher quality of life) in the natural world possible.⁹³

It is worth pondering whether religion has been a useful tool to explain the awe of the world, to manage terror and fear even of death, to create hope (whether true or false), and to manage

⁸⁸ Brüne, “On Shared Psychological Mechanisms of Religiousness,” 222, 225.

⁸⁹ For the definitions of neurosis and epidemic neurosis see Lorenz, *The Waning of Humaneness*, 164.

⁹⁰ Detlef Fetchenhauer, “Evolutionary Perspective on Religion – What They Can and What They Cannot Explain (Yet),” in Volland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 279–80.

⁹¹ See Bernard Crespi, “The Kin Selection of Religion,” in *Oxford Handbook of the Evolution of Religion*, ed. J. M. Liddle and T. Shackelford (in press). Also see online:

www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199397747.001.0001/oxfordhb-9780199397747-e-9.

⁹² Tremplin, *Minds and Gods*, 35 quoting Robert Wright.

⁹³ *Ibid.*, 35.

emotions. It can be said that religion deals with a trajectory of issues. The fear of death, hope of eternal return and rebirth, meaning-making, and access to some secret knowledge of existence seem to be enough reasons for the rise of religious thinking.⁹⁴ The human species has always experienced intensified emotions that are either repressed, sublimated, or expressed. Religion simply had more emotional utility than plain sensible thinking. Religious enthusiasm can often be used them as coping mechanisms, as many people still do to cope with pain, guilt, and death.⁹⁵ V. Frankl suggests that the door of religion remains open “for drawing upon the spiritual resources” and finding an anchor with a feeling of security found nowhere else.⁹⁶ Perhaps religion still has the same exhilarating, emotionally utilitarian function today. Eckart Voland points out that the spontaneous affinity toward religion simply does not arise through intellectual and rational analysis; otherwise, the entire premise of faith would have to be rationally dismissed.⁹⁷

It is easy then to see how the adoption of religion generally follows three stages that meet people’s mental and emotional needs:

1. The invisible actor, god, or avatar is designated to supplicate to, for appeasing one’s fear and to elicit the gratifying emotion of feeling protected.
2. This invisible actor, due to human loyalty, decided to share his secret and the truth of creation with his chosen people, and the believer then experiences the good feeling of belonging to a group.
3. Believing in this actor means earning approval and blessing in all life events, being able to request favors from time to time, and being able to be reclaimed after death.

These three aspects of religion gradually became ingrained and universal in much of humanity’s social conduct. In this way, believing in gods is not just pious thinking, or contemplation about the afterlife. Instead, it has had to do with adaptive and “computational utility,” sometimes in the most profound and mysterious ways, offering techniques to negotiate one’s inner conflict and needs by reaching out to the ultimate outer authority. The mystery of believing in gods resides in the implicit unconscious plane, but such a belief system is used for explicit and conscious reasoning, for practical purposes, for moods, worries, and real-life issues.⁹⁸ Although religion may still be considered an emotional or unconscious strategy for many people to rescue their psychic and emotional stability, at other times religious thinking overshadows the rational mind.

⁹⁴ Gregory M. Nixon, “Myth and Mind: The Origin of Human Consciousness in the Discovery of the Sacred,” *Journal of Consciousness Exploration and Research*, 1/3 (2010), 10, 19, 25, 27, 37.

⁹⁵ Frankl, *The Will to Meaning*, ix, 72.

⁹⁶ *Ibid.*, 140, 144.

⁹⁷ Eckart Voland, “Evaluating the Evolutionary Status of Religiosity and Religiousness,” in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 9, 10, 12.

⁹⁸ Tremlin, *Minds and Gods*, 179–181, 185–186.

Thus, religious compulsions override deeper rational considerations and easily lead a person to become an enthusiastic devotee of a religious institution.⁹⁹

There is one other aspect of biology to be taken into consideration regarding religious behavior, and that is our unmistakable primate behavior. Human behavior emulates the primate behavior model of fear and subjugation to higher command. In ethology, as Jay R. Feierman notes, two primate behaviors have been observed. Type I behavior is the act of submission due to fear, anxiety, and self-protection, the “make-oneself-lower-or-smaller-or more-vulnerable” behavior. Otherwise, anger, and the punishment from a more powerful member of the group may ensue. In the human case, Type I behavior takes the form of supplication and lowering oneself to appease religious authorities and the gods.¹⁰⁰

Type II behavior is a fear-reducing and favor-demanding primate behavior that involves pleasing the dominant figure or the alpha male. In this corollary for humans, it is the chanting, praying, rituals, and animal sacrifices done in order to appeal to god for fear-reducing purposes as well favor-demanding. This behavior is not phylogenetically adaptive nor is it the work of natural selection; it has simply evolved with the fluidity of adaptation.¹⁰¹ Generally speaking, humans have fear, but a more expressive fear is vis-à-vis the higher authorities. In the case of religion, the greatest fear has been of gods and the priests or the kings. Type I and II behaviors, lowering themselves and asking to receive protection for their life, are complex adaptational behavior of the high primates. The role of an alpha male in its different manifestations has played the role of a superior entity who provides protection and shows mercy to the obedient ones as seen in all human societies. Desmond Morris in his well-written and well-argued book, *The Human Zoo*, has linked human biology to culture by describing the role of the alpha male, the dominant males and super-leaders of the tribe being replaced by a super- and single-god, an all-seeing and all-controlling god who manages at times larger size of the tribes. The evolutionary process of religion through centuries has been to bring the tribe together in precarious conditions with the help of male protectors or super gods who cannot be around to answer questions but will punish and reciprocate violence with violence and demand subservience.¹⁰²

4. The Logic and Strategy of Religion in Evolutionary Biology

The strategy of religion as a form of mental survival comes head to head with logic and rational thinking, especially when arguing physical and metaphysical claims. It can be said that the laws of reasoning are part of the laws of evolution and adaptation. So, if life, or biology, is the law-giver, then humans are both the followers and the implementers of the logical laws of biology.

⁹⁹ It is about how the religion/divine and spirituality can capture the mind and form thoughts and emotions. See David A. Kessler, *Capture: Unraveling the Mystery of Mental Suffering* (New York: Harper Collins, 2016), chapters 6 and 7.

¹⁰⁰ Jay R. Feierman, “How Some Major Components of Religion Could Have Evolved by Natural Selection?” in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 56.

¹⁰¹ *Ibid.*, 57–58, 64.

¹⁰² Desmond Morris, *The Human Zoo* (1969; London: Vintage, 1994), 7–9, 9–14, 15.

By following the laws of evolution, the species is rewarded by moving forward. Any species that violate such laws would wane and go extinct. As William Cooper argues, there is no doubt that evolution itself is not the law but is the enforcer and law-giver, and its laws are unchangeable,¹⁰³ abandoning its laws would be fatal to the process of natural selection and moving forward. And yet, religion offers ideas that supersede and are outside of the laws of biology, and hence the laws of nature.

The very existence of religion seems to be an anomaly to evolutionary theory, says Detlef Fetchenhauer. Evolutionary epistemologists have proposed that animals, humans included, are always expected to perceive their environment in a valid manner, but the irrationality of religion would seem to contradict a “valid” perception of the environment. Even though humans perceive their environment in a valid manner, the margin of fallacy in humans is higher than in other animals due to manipulation and deception through sophisticated mental imagination and linguistic expression.

Biology is not a gamble, but is founded upon logic. As Cooper suggests, logic itself was primordial and the platform of evolution. Logic “as a body of principles, has always existed and always will ... and adaptation took place because the laws of pure logic are independently correct.”¹⁰⁴ The challenging issue here is to seek a proper definition for the term and the function of “logic.” In religion, the faithful follow probabilistic logic, a logic that suits the needs and performance of the mind in a particular generation and circumstance. So, this logic is not a durable, constant, or objective logic. To support the non-absoluteness of religious logic requires extending it to the general nature of logic. Although pure logic exists outside of relativistic biology, some have argued this logic may not be constant. This means logic itself may be unfolding and non-absolute in its core.

The challenge rests in the unfolding nature of logic which cannot be used as the backbone of any “truth” representing an absolute entity. Ethologist and Nobel Laureate Konrad Lorenz challenged Kantian logic by concluding that logic or pure reason should not be treated as though it was in a central stillness, fixed and absolute. The peak of human thinking itself is not absolute nor does it have *a priori* validity; even mathematics follows the laws of biological relativity.¹⁰⁵ In other words, not only is biology a dynamically open system which does not permanently hover around any absolute and static logic, but also humans as logicians still lack a great deal of experiential and empirical input to suppose a more comprehensive non-anthropocentric and nonlinear logic.

This being said, the higher order of biological life follows logic and natural selection, but when it comes to human thinking and emotive aspects, this logic becomes fussy and unclear. This means religious beliefs cannot be assessed or measured against a logical system such as deductive logic,

¹⁰³ William S. Cooper, *The Evolution of Reason: Logic as the Branch of Biology* (Cambridge: Cambridge University Press, 2001), 2–3.

¹⁰⁴ *Ibid.*, 178–179, 191–192.

¹⁰⁵ *Ibid.*, 2–3, 16.

which is used in mathematics and scientific methods. The application of religious logic may be considered as chance theory, more like flipping a coin than precise deductive logic. Religious logic is a utilitarian logic with a non-thinking trust in one's counterintuitive perception, and trust in religious authorities. "Trust" is the work of transient probabilistic thinking, not durable logic. Thus, religion does not follow any logic, but it is a probabilistic calculation by people in a given generation and culture.

The predominant fact about religious "logic" is that average believers in god tend not to change their religious trust until the end of their life, simply because to their estimation religion has offered less risk than non-religion. Such people cannot get rid of their faith, nor can they substitute it with something "less." Emerging out of the psychological habits of generations, the metaphor of "god" has found such a deep seat in the brain that its negation feels like a frightening emotional impossibility, an unsuitable logic, or a bad probability. In other words, a shift from "god logic" to "no god logic" may not easily happen. Even though the psyche of the thinker is presented with the rational basis for such a shift, it is not a given that religious or counterintuitive logic can be overturned by an empirical deductive logic. However, conditional social and cultural logic are sets of logic which function according to circumstances. These sets can be both deductive and inductive but are continuously in flux and at times are replaced by new sets of social logic.

The logical biological strategies of an animal's survival and defense, such as camouflage, shells, sharp claws, horns, etc., provide for defense, survival, and maintenance of security. If those horns or sharp claws turn out to be useless, they become extra things that inhibit the animal in its normal function. At this point, the logic of natural selection will cause it to wane. If we take this logic of biology and apply it to the choice of religion, it serves as a cognitive protection like a shell, for as long as humans need it to survive. Religion could plausibly be seen as a defense strategy that follows an inner logic by appeasing human anxiety and the fearful mind, even when the *content* of religion does not match the logic of the natural world and its function. The paradox of this relationship between logic and illogic lies in the contrast between what is necessary and useful and allows humans to adapt and stay fit (biologically logical) and what is not necessary and damages their wellbeing (biologically illogical). The middle and subjective ground is when the illogic of religion helps a death-fearing or god-fearing person, for example, to stay biologically (psychologically) fit.

But if the remedy of religion gradually becomes more and more oppressive, illogical, and hyperbolic through acts such as ordering the killing of non-believers, or attributing disease and healing only to god, or conducting harmful religious rituals, then certain aspects of religious logic become destructive. These damaging aspects inhibit the development of humans in an evolutionary sense, particularly in the face of scientific understanding, such as the reasons for diseases and healing, which are better understood and cannot be attributed to gods. In these cases, religious logic may easily be replaced by alternative logic or "updated" remedies for one's fear and anxiety. The pointlessness of religious logic can be seen clearly with the Aztecs, who

believed that the sun rose due to the results of sacrifice and needed to be fed human blood every day in order to make it rise. Only if they stopped sacrificing would they see whether or not the sun still rose, but this was out of the scope of the Aztecs' cognitive biases.¹⁰⁶ In another example, before the arrival of the Inca, the powerful Chimú civilization in Peru killed hundreds of children between the age of five and fourteen, and sacrificed animals as part of religious mass rituals.¹⁰⁷ Such lapses of reason, at least through our modern lens, in the context of religious thinking are countless throughout history.

Correspondingly, how personally and deeply a scientific belief is held can also be an example of lapsed reason that has become another "religion." For example, the belief in Ptolemy's geocentric model and the movements of heavenly bodies around the earth was replaced with the Copernican heliocentric model. But as we know, some scientists had a very hard time letting go of their theories, even in the face of evidence. The contrast between errors in science and religion is that science is unfolding and self-corrective, whereas religion and religious logic may be resistant to self-correct because its legitimacy depends on its absoluteness, even if it is wrong. Errors occur either in the absence of knowledge or as a consequence of computational errors. Both cases of human error can be corrected if lapses and slips can be detected, and feedback is taken into consideration. As to why humans continue their errors and remain insensitive to empirical evidence in the case of religion is perhaps due to fear and emotive cognitive propensities, which lead them to rely on probabilistic and risk calculation.¹⁰⁸

How do humans bridge this distance between logic and illogic, between causal reality and illusory beliefs?¹⁰⁹ How do they live with this cognitive dissonance? The short answer is the importance of a sense of belonging to a community, and the cleverness of strategy. Since external circumstances were in a constant state of flux and transformation, our ancestors had to adapt to their environment with beliefs that corresponded to their needs (even if illogical) in order to survive better. If a religious tradition was time-location-bound, it would tend to expire and be replaced by a newer one when there was no further use for the original. This behavior in human evolution is called "strategy."¹¹⁰ Our ancestors' choices were limited, and the populations chose a model of logic that would operate on its own pillar as a survival strategy,¹¹¹ even though this strategy may have stood in breach of deductive logic and sound intuition. Religion, a strategy of psychological survival, has produced an abundance of counterintuitive ideas through

¹⁰⁶ Brüne, "On Shared Psychological Mechanisms of Religiousness and Delusional Beliefs," 221.

¹⁰⁷ The archaeologists discovered a mass grave of about 140 children who were believed to be killed as part of religious ritual. International news agencies reported it on April 28, 2018.

¹⁰⁸ For more technical discussions on computational errors, see James Reason, *Human Error* (1990; New York: Cambridge University Press, 2003).

¹⁰⁹ It is interesting to relay the story of a medical doctor in a Varanasi hospital, India, with whom I met and spoke as a colleague some years back about the water-borne disease as the result of drinking the water of the Ganges River. He personally believed the Ganges was holy and would never make people sick, even as he treated dozens of people with water-borne illnesses.

¹¹⁰ Cooper, *The Evolution of Reason*, 5, 7.

¹¹¹ *Ibid.*, 8–9, 21, 28.

lapses of logic. Against this backdrop, the “logic of decision” is the choice of the most reasonable course of action from a set of available courses of action.

In putting Blaise Pascal’s probabilistic strategic decision-making in perspective, Fetchenhauer writes that in the past many people believed in their respective gods even though they were not sure if such gods existed. Indeed, it was easier and less costly to side with religion just in case if gods really existed. So, Blaise Pascal’s strategy was an archetypal strategy that many humans intuitively have also followed.¹¹²

In simpler Pascalian words, to believe in god and follow religion may be innocuous, and might even bear many rewards in this and the next world. No matter how naïve the content of the religion, the strategy of survival ranks first and takes precedence over any pure reason. In the same vein, the proposals of hell and heaven given by the priests, although unprovable, acted as a psychological tool for encouragement and deterrence, since the risk of not believing in such things could be risky: “What if they are right?” Thus, with a pragmatic approach, imagination is transformed into belief out of a sheer strategy for survival from the wrath of gods.

The effect of religion and religious belief on human personality and sociocultural dynamics is immeasurable. The real issue is how much free-thinking people have experienced in spite of having firmly believed in one religion or another. The last theme to consider in the treatment of religion is how absolute and flexible it actually is and how different cultures evolved with their open and closed religions.

Open and Closed Gods

As we explore the evolution of human thought from pre-philosophy to liberation philosophy, it behooves us to also consider that perhaps some religions are more limiting to philosophical thought than others. Henri Bergson (d. 1941) in *The Two Sources of Morality and Religion* discussed morality and religion as natural products of human psychological evolution. In his discussion, Bergson specifically referred to the danger of maintaining a static morality as opposed to a dynamic one. He believed that as a consequence of the dissonance between a static and dynamic morality, two types of societies could arise: a closed society which possesses codified laws compelling humans to mechanistically conform, and an open society with free creativity in art, philosophy and mysticism.¹¹³ Through this bifurcation in human decision-making about morality closed and open religions evolved, each one highly influencing the nature of individuals and societies. Closedness and openness of morality thus became important

¹¹² Fetchenhauer, “Evolutionary Perspectives on Religion,” 289.

¹¹³ See Henri Bergson, *The Two Sources of Morality and Religion* (Notre Dame: University of Notre Dame Press, 1977). See also “Henri Bergson,” <https://www.britannica.com/biography/Henri-Bergson#ref202567>, accessed October 28, 2018.

psychological material in concretizing closed and open religions. In the course of history, even closed and open gods emerged.

In brief, an “open” religion connotes being non-essentialist,¹¹⁴ non-ethnocentric, non-theological, open to all, non-authoritarian, non-centralized, probably polytheistic, tolerant, and may have contained more than one interpretation. A “closedness” religion, in contrast, is theological, tribe-based, strict, centralized, authoritarian, probably monotheistic, often intolerant of others. It perceives itself as absolute.

The open or closed nature of gods and the corresponding religious culture formed due to intricate dynamics coming from people, the size and the landscape of geography, central or decentralized city-states, the power of myths, and the vulnerability or the temperament of the population. As myths were gradually assimilated and adopted by different religions, stories were given divine or superhuman status, and thus were revered as unchangeable. This attitude created mild to severe degrees of intolerance. The attitude of intolerance had to do with the “closed” religions which were viewed as absolute and ultimate. Conversely, an attitude of tolerance appeared, with some religions in various parts of the world being open to evolution and further interpretations.

One may also ask whether having adopted a *deist* belief or a *theist* makes a difference in a religion’s perspective and tolerance of others. Deistic religions adopt the notion of one or more gods in the universe, but such gods do not necessarily intervene in the daily affairs of the phenomenal and dynamic world. This deistic approach allows other religions and forms of spirituality to develop alongside of it. Theistic religions, on the other hand, hold that god is the creator and the ruler of the universe who also governs the world and the personal lives of each generation in every culture. And yet, theism is the narrative of a god who is both involved in and aloof from the world of humans: he is so close that he keeps accounts of people’s good and bad deeds and promises rewards and punishments, yet is so aloof that he simply cannot attend to every wish that humans make. This reasoning provides an irrational outlet for the rational question of how an apparently all-powerful god cannot manage to make things right on earth and for all humans.

We can say that the narrative of each religion historically evolved around the attitudes of either “open” or “closed,” “tolerant” or “intolerant,” “deist” or “theist.” Perhaps some of the ancient Greek religions, for example, developed open religions that allowed philosophers and critics (although not without friction) to live side-by-side. India’s various religions of the past and today are generally representative of open religions, somewhat tolerant of one another.

The Abrahamic creeds Judaism, Christianity, and Islam, in contrast, represent closed religions with fixed narratives reflected in their scriptures. The Abrahamic religions present archaic myths as actual historical episodes in their sacred scriptures, and epitomize the claim of the mighty,

¹¹⁴ See Torsten Hylén, “Closed and Open Concepts of Religion: The Problem of Essentialism in Teaching about Religion,” in *Textbook Gods – Genre, Text and Teaching Religious Studies*, ed. Bengt-Ove Andreassen and James R. Lewis (Sheffield: Equinox Publishing, 2014), 16–42.

living, and invisible god. This inflexible stance caused polarization of the faithful with their own strong theological positions against the “gentiles,” “pagans,” or “heretics” who remained unblessed and unfavorable in the eyes of god. Jan Assmann points out that a propensity to violence is not exclusively an Islamic phenomenon but it is inherently a problem with all the truth-claiming monotheistic religions, especially when the rhetoric of tension draws a sharp line between a believer and non-believer. The distinction between a “believer” and “non-believer” reduces the cognitive space to maneuver flexibility for the practitioner.¹¹⁵ These Abrahamic religions, each with their exclusivist attitudes and closed qualities, historically constructed an absolutist interpretation of reality, and at times caused irreconcilable confrontations between their theologians and critical mystic-philosophers of their own and other religions.

Conclusion

The earliest innovators of religious ideas conceived of themes and rituals, from simple worship all the way to peculiar practices vis-à-vis invisible and supernatural agents who operate and control life here and now, as well as life after death. This desire for an independent reality outside of this world had its basis in biological adaptation and psychological survival in the face of a cold and unresponsive natural world. In certain ways, religion may have been a response to the monotony of “secular” life.¹¹⁶ The mechanical, unresponsive and impersonal nature of the world, however, did not lend credence to the idea of a belief in god. The nature of reality was left wide open for interpretation, leaving people vulnerable to cognitive deception, and as a result, hundreds and thousands of beliefs and stories were invented.

The curious blind spot in human history is how a number of clever humans conceived of so many non-verifiable and non-visible religious ideas and managed to convince large crowds of their and future generations to believe these counterintuitive stories and parables. But if people are evolutionarily hardwired with a propensity toward religious thinking, perhaps that leads to being convinced by such religious imaginations and counterintuitive beliefs.

Pascal Boyer in *The Naturalness of Religious Ideas: Cognitive Theory of Religion* (1994)¹¹⁷ defends the naturalness of religious thinking despite the variations in religious representation and skewing of previous generations’ representations. “Naturalness,” as Boyer explains, means self-evident, being human in this world. It also entails the non-observable and extra-natural agencies and processes in most human cultures. In making the case for religion, he asserts that there is stable and systematic continuity and even predictability within the cultural transmission of the

¹¹⁵ Jan Assmann, *Totale Religion: Ursprünge und Formen puritanischer Verschärfung* (Wien: Picus Verlag, 2016), see the first four sections of part one of the book.

¹¹⁶ Montagu, *Man: His First Million Years*, 181.

¹¹⁷ Pascal Boyer, *The Naturalness of Religious Ideas: Cognitive Theory of Religion* (Berkeley, Los Angeles: University of California Press, 1994).

meaning and truth claims.¹¹⁸ In other words, there is an agency of biology and mind, a *reason* for the ongoing recurrences of religion in human societies.¹¹⁹

However, given diversity in cognitive function and human intelligence, in the context of critical philosophy or free thought, people have criticized themselves and have either rejected religious thought or never entertained religious thoughts to begin with. Boyer's theory is hence criticized for its linearity, that all humans operate based on evolutionary hardwiring. People are not trapped by religion, in any absolute way, and are free to imagine and invent new ideas, be they religious or non-religious.¹²⁰

The importance of the religious imagination lies in its evolutionary utility during critical times when archaic humans used it as a shield from their fears and to provide explanations about the unknowable. Today some critical thinkers consider such imaginations simplistic and their necessity far-fetched. However, fear with all of its trajectories is the basis for many irrational behaviors including blind imitation and herd-like obedience, as we see in the culture of popular religion.

Chapter 3

The Instinctual Modules of Religion: Fear, Obedience, and Imitation

After having recognized how religion emerged as a bio-cognitive by-product, we can now look in more depth at three prominent mental routes responsible for the choice of religion over no religion. Against this background three strong tendencies loom large: 1. Fear, both existential and of higher authorities, 2. Obedience, a kind of subjugation to the gods and religious establishments, and 3. Imitation of parents and communal practices and beliefs. Before being able to deal with the “philosophy of existence,” earlier humans had to figure out how to keep their *biology* of fear at bay in order to make that existence more manageable.

The human species, like all other species, has been forced to follow one of three evolutionary loops: *adapt*, *change*, or *go extinct*. These processes forced humans to constantly make new decisions: to migrate, shelter themselves from the external elements, adapt to food and climate changes, and win over competition. But the handling of cognitive matters was far more taxing on

¹¹⁸ Ibid., chapters 8 and 9.

¹¹⁹ Ibid., 4–7. However, historically speaking, larger populations of communities have tended to take refuge in religions more than smaller minorities. This is perhaps a reason why empires with a religious veneer have held greater longevity in history.

¹²⁰ Niels Henrik Gregersen, “The Naturalness of Religious Imagination and the Idea of Revelation,” *Ars Disputandi* 3 (2003), 1–27.

the human psychological system than the physical ones. The paradoxical shift in brain function had brought with it talents unprecedented in previous hominid species, but at the same time the new brain function generated a hyper-reflective tendency, with anxiety, mental crisis, and even a propensity toward spatially imaginative ideas by perceiving things that never existed in reality. With the development of the frontal lobe, the overwhelming capacity to reflect led to serious perplexities – such as wondering why we exist in the world, what is the meaning of this existence, and who are the operators of the world – which resulted in anxious thoughts.¹²¹ The detriment of hyper-reflection and anguish could have easily brought humans to the verge of their collapse by falling into depression or committing suicide. But such extinction did not happen. Instead, adaptation and change won out. However, adaptation was not without severe psychological consequences, which seemed to usher in new crises, as we will see.

Fear

It is said that fear is the first emotion of the fetus.¹²² It is also said that “the oldest and strongest emotion of mankind is fear, and the oldest and strongest kind of fear is fear of the unknown.”¹²³ Fear continues to revisit humankind in different stages of life. There have been times that even one’s own thoughts and freedom have been feared.¹²⁴ The cognitive response to a triggering instantaneous event is usually excitation and expression of emotion¹²⁵ in the short term. In the long term however, sublimation of *fear* can turn into an ambiguous state of *anxiety*. Thus, fear can become a psychological construct without being precisely discoverable.¹²⁶ Because the complexity of fear-anxiety often has no particular object to fear, the impulse can generally stem from being trapped in one’s own thoughts. The propensity of too much thinking turns into an obsessive tendency, at times towards obscure things. Among many, latent fear turns into irrational anxiety. Fear causes emotions and excitation of the brain that can cause the disturbance of the logical faculty. Simply said, “what is not understood generates fear.”¹²⁷

In the course of cognitive development, generally speaking, *Homo sapiens* faced two dominant fear phenomena. The first was a trajectory of object-based fears and anxieties stemming from the

¹²¹ In the brain, although various cortical regions together with the midbrain and brainstem through interactions participate in responses to fear, the *amygdala* is primarily responsible for fear and the nearby nucleus of the *stria terminalis* for anxiety. See Ralph Adolphs, “The Biology of Fear,” *Current Biology* 23/2 (Jan. 21, 2013), 82–83, 88.

¹²² Joseph Campbell, *The Power of Myth* (New York: Anchor Books, 1991), 59.

¹²³ It is the saying of the American Novelist H. P. Lovecraft.

H. P. Lovecraft Quotes. BrainyQuote.com, BrainyMedia Inc, 2018.

https://www.brainyquote.com/quotes/h_p_lovecraft_676245, accessed November 28, 2018.

¹²⁴ Erich Fromm, *The Sane Society* (1956; London: Routledge & Kegan Paul, 1976), 34.

¹²⁵ Almost 20 percent of the population suffers from an anxiety disorder in any given year. See Adolphs, “The Biology of Fear,” 89. The propensity for anxiety among human ancestors probably ranged from real panic to phobia, stress, thoughts, memories, premature death, fear of predators, inability to cope with life circumstances, and all the ways to misinterpret and personalize natural disasters.

¹²⁶ Adolphs, “The Biology of Fear,” 79.

¹²⁷ Eckart Voland, “Evaluating the Evolutionary Status of Religiosity and Religiousness,” in E. Voland, W. Schiefenhövel (eds.), *The Biological Evolution of Religious Mind and Behavior*, Berlin Heidelberg: Springer-Verlag, 2009, 13-14.

physical elements such as thunder, earthquakes, floods, and other spectacularly scary natural events. There was also the fear of predators as well as human enemies— all physical objects. The second set of fears, it can be assumed from the perspective of our current mindset and the history of human psychology, was triggered by things which were *not* material or object-based, such as a fear of the mysterious forces of nature, including death, and the imagined actors behind natural disasters as well as similar illusory and unexplained fears.

Historically and evolutionarily, object-based fear was a common daily experience, compelling the brain to qualify and try to allay unpleasant and impenetrable occurrences. Trying to understand the world around with its millions of stars in the dark night sky, observing the shifting seasons, and experiencing terrifying events have always been awe-inspiring. Such events were obscurely mysterious phenomena to our ancestors. Fear-inducing phenomena were natural events like the daily sunset and the corresponding fear of predators with the coming of night, thunder, earthquakes, volcanoes, eclipses of the sun (which must have seemed like Armageddon), and massive floods. Other existential fears were diseases, high fever, sudden death, child mortality, maternal mortality during birth, fear of one's own death, and other obscure personal anxieties. All of these occurrences were painful and unexplainable.

The phenomenon of fear of non-physical objects emerged due to the rise of *self-awareness* in humans, something perhaps distinct in the animal kingdom. The change in morphology and function of the frontal cortex in the brain made self-awareness such a strong characteristic that the human being became a hyper-reflective animal. Out of this evolutionary change in self-awareness, simultaneously a greater intelligence and daunting angst were produced. Vague concepts such as one's life circumstances and destiny, full of uncertainty, loomed as one such source of subliminal fear. Over time, objectless fear grew emotionally serious.

Searching for solutions became more and more urgent in order to fend off these anxieties, especially when humans faced their own powerlessness in nature. Rather than be paralyzed by fear, our human ancestors employed creative mental strategies for appeasing these existential fears. It was panic in response to terrifying situations of nature as well as the fear of imagined objects or situations that brought about magic and superstitious rituals.¹²⁸ For example, the rise of early shamanism, perhaps the oldest spiritual practice, was not to necessarily change the outer reality but to alter reality in one's own perspective.¹²⁹ Groups made fires, chanted, and perhaps danced, all of which would result in formless mental energy. In this way, the response to fear was to change the mental configuration. The priest and medicine man were one and the same thing who sought in healing the soul and the body by elevating the spirit to distant realms

¹²⁸ Walter Burkert, *Creation of the Sacred: Tracks of Biology in Early Religions* (Cambridge: Harvard University Press, 1998), 46–47.

¹²⁹ See Richard Leviton, "Through the Shaman's Door," *Yoga Journal*, July–Aug., 1992, 52–55, 102.

through the medium of dance and drum beating.¹³⁰ Around these and similar themes, elaborate stories, beliefs, and ceremonies were constructed.

The gradual formation of groups with social hierarchy produced more shamans and priests who performed such rituals to change perspective, create formless mental energy, and appease fear. The alteration of reality through this mental configuration gradually evolved into a dependence on belief and rituals, and eventually, systematic religious thinking. Thus the rise of religion, with no external form or materiality in nature itself, became an inner phenomenon that changed human perception for dealing with many disturbing emotional matters, fear in particular. Religions in actuality did not promise anything perceptibly deliverable; it was inner cognition that converted the fear into hope.

The development of priest-dominant societies who organized such rituals made communities dependent on priests for the fear-reducing rituals. Gradually, authoritarian rule was founded and the effect of religion shifted through the priests' terrifying threats of punishment by mysterious forces of nature and gods. Religion *itself* sometimes became a source of fear, supplanting the original fears of nature and existence. Complex feudal city-states orders additionally created more fear that made voicing one's opinion a distant memory.¹³¹

It is important to remember of course that religion did not originally create fear in humans; religion was created *because* of fear. Religion was a mechanism to cope and respond to fear in the most powerful cognitive fashion, but it then became a source of collective thinking and control.

Priests and rulers capitalized on the element of fear in solidifying their domination, perhaps as early as the Neolithic period. The 'theology of fear' became a historical condition between the theocratic rulers and the ruled. Gods became entities to whom humans prayed and appealed in order to handle emotional and psychological quandaries. Meanwhile, in sociocultural evolution, fear became a commodity for the ruling class to maximize religious lies so that they could exploit emotionally fragile and fearful people. The ruling class also shared the same fears, as they were trapped in their own fears. These rulers were subject to the same religious "laws" and fears of the gods, but they were also the manipulators and controllers of the religion and the people. The more gullible the groups, the greater the scope of manipulation under the umbrella of religion for the sake of managing the fear. The fear-manipulating ruling class possibly defrauded themselves as much as the weak.

Fear, thus, remained a singular influential dynamic in the development of religions as they were adopted and adapted by humans. Can we say then that religion was perhaps the result of the

¹³⁰ Wade Davis, *Shadows in the Sun: Travels to Landscapes of Spirit and Desire* (New York: Broadway Books, 1999), 144, 146, 148, 150.

¹³¹ Beginning about 3,000 years ago, the longing for ascetic and monk-like life, various Indian teachers by dispossessing themselves from property, land, live stocks dwelled from place to place half- or fully-naked. Their search of natural and mental equilibrium was perhaps an impetus to leave behind their own agriculturalist communities for a better life of 'hunter-gatherer' in a true sense.

earliest human experiences of Post-Traumatic Stress Disorder? The forces of fear in the psyche remained so dominant that the irrationalities contained in beliefs were often ignored or even sublimated. As the members of a community committed to the same beliefs, their irrationalities were given even stronger immunity from criticism from within, and consequently the prospect of living in fear and irrationality within the walls of a common culture remained the only option. Fear was institutionalized and enveloped through the medium of religion.

Obedience

Obedience in the human context generally stands in opposition to self-rule or autonomous thinking, thus fear and obedience usually develop together. The psychological discrepancy of why people choose obedience over self-rule is partly biological (innate in primate life, as discussed earlier), and partly a cognitive-cultural calculation. This is to say, if fear is the punishment, obedience must then produce a reward. As Tim Friend has colorfully noted, the millions of species on this planet are for the most part concerned with the same four things: ‘sex,’ ‘real estate,’ ‘who’s the boss?’ and ‘what’s for dinner?’¹³² This fundamental question of “Who’s the boss?” leads to the issues of obedience and power structure within a species, and the blueprint of the power structure in the high primates must have influenced humans in the manifestation of obedience in human society, including religious obedience.

Obedience seems to have been the foundation of human history partly due to our biology. In viewing humans as social animals, there is always a “boss.” Thomas Bouchard describes three questions that humans had to ask in regards to obeying the highest and most legitimate authority, from ground-level realities to greater terrestrial and even celestial levels: “Who is in charge?” “What does he/she want?” and “What do I do?” The answers to these questions in a religious context are: “God is in charge.” “He wants obedience.” And “You must believe in him and carry out the wishes of god’s representatives.” Human-constructed tribal gods became the target of obedience, often for emotional and cognitive survival. The strength of the urge to obey and the power of the fundamental question of ‘who’s in charge?’ is striking and baffling, especially considering cases when obedience is intolerably oppressive, and yet many endure their abject predicament either by adaptive-addictive habit or by force, rather than disobeying and finding liberation.

Obedience is an accord between the domineering and the dominated. Since it is a characteristic of high primates to follow a male leader, the alpha male, humans also, in the course of history and even on an everyday level have shown an unequivocal propensity to follow a (typically) male leader, taking the role of chief of a clan, a king, a warlord, a prophet, a priest, or even a political and military leader in different times. Fear and obedience, in a certain sense, explain how humans have justified relinquishing all their responsibilities and giving it over to the leader;

¹³² Quoted in Tremplin, *Minds and Gods*, 25–26.

through the relinquishment of self-responsibility and being obedient followers, they anticipate less personal fear.

Being inferior to and obedient to other humans are as much social choices as religious ones. The strangest acts of obedience in ancient times were rooted in fear. Genital mutilation such as castration or circumcision has a complex psychological background in ancient traditions as a form of ransom and a means of being saved, on the assumption of being inferior vis-à-vis the superior force. To accept genital mutilation has to do with certain anxieties for better chances of survival, a rather desperate objective.¹³³ Accepting the position of *inferior* and giving in to being obedient is a strategy of survival and minimizing threats. Obedience to god and acceptance of an inferior or subservient rank in human perception is the most important maneuver; in fact, this inferior attitude to god has made the whole difference in appeasing fear.¹³⁴ People who show submission to god (and accept their inferiority) are operating under the assumption that therefore god will not attack them without cause. The action of fear and its reaction of obedience in curtailing trepidation has had to do with making life safer through believing in religion.¹³⁵

It is however puzzling, considering the immense thinking capacity of the human mind, that we obey people (or invisible gods) without thinking. Why should we, or what happens if we do not? It may be that a great deal of human behavior is rooted in blind obedience without analysis. The experiment of blind obedience to authority conducted by Stanley Milgram at Yale University in 1962 showed the complexity and dangers of obedience by average and decent people. In this experiment of social psychology, it was revealed that average people followed orders of their superiors without any critical objections, even though they knew following such orders required inflicting pain and suffering on other fellow human beings. The experiment showed that each and every person had the freedom to choose disobedience for the good of their own conscience and well-being of others, but the majority did not.¹³⁶ In the mechanism of blind obedience without objection, the phenomenon of compassion was blocked, even though unintentionally, which made the suffering of others likely. The core of this experiment was to expose the dark side of obedience, when blindness and irrationality are accompanied by a casual following of orders and norms without critical evaluation of their damage, and this must certainly play a role in people's blind obedience to the dictates of a religion.

In the religious context obedience is identified with virtue, and disobedience obviously associated with sin; at times, the definition of a "good person" has been one who does not possess one's own thoughts, is subdued and anesthetized, or brainwashed rather than having

¹³³ Burkert, *Creation of the Sacred*, 47. The author states that when the hunter traps his prey without the possibility of escaping, prey bites or cuts one's own testicles as a means of surrender and obedience.

¹³⁴ *Ibid.*, 80.

¹³⁵ *Ibid.*, 31.

¹³⁶ The concept of "Obedience to Authority" was coined by Stanley Milgram in his controversial book *Obedience to Authority: An Experimental View* in 1974. Since then Hannah Arendt and Erich Fromm have written on the subject.

thoughts of being free.¹³⁷ This type of obedience has historically benefited the religious ruling classes who have used threats, promises of rewards, other manipulative language, or sheer force to maintain their positions. It has been this frail human condition that has often called for disobedience for the sake of freedom.¹³⁸ As Erich Fromm puts it, disobedience for the sake of freedom is out of reason and is not directed *against* something, but *for* something – it is to bring light to darkness, it is waking up, and daring to know.¹³⁹ Fromm also points to the priestly way of anesthetizing people by controlling their thoughts and brainwashing them to the point where they can kill ruthlessly out of faith – a way of sustaining prehistoric savage thinking.¹⁴⁰

Obedience to god is so important to the structure of a religion that there are myriads of stories that teach the dangers of disobedience. In the Judeo-Christian-Islamic religion, this is symbolized by the anecdote of Adam and Eve in the Book of Genesis, who received the divine consequence of being thrown out of Paradise into the carnal world because they disobeyed God's orders, or "for having swallowed an apple."¹⁴¹ This ancient story carries a message of serious consequences that will ensue as a result of any defiance, including self-reflecting or self-deciding. Adam and Eve were thus made responsible for the "original defiance," interpreted by Saint Augustine as "original sin."

As Stephen Greenblatt expounds, Augustine had to justify the original mistake that took place in Paradise, stating that god is not responsible for the innate defect of the Creation: it was Adam and Eve who had to fall from grace. This meant that disobedience was *not* part of the original design, and thus all human kind are sinful when they participate in disobedience.¹⁴² Obedience to the divine remains primal, and any longing for freedom without being given divine permission would be subject to earthly pain, as Adam and Eve discovered. Perhaps Adam even represents the first defiance against god or religion, someone longing for existential freedom. Therefore, Adam and Eve's story can be read as freedom from god's "golden cage" of Paradise, so to speak.

Blind and dogmatic obedience represses rationality, as it did for Augustine in his treatment of dialectical human reality. Augustine's interpretation implied that nakedness, sensual lust, and making love was nothing but disobedience. Copulation was certainly not part of god's plan in and out of Paradise; it was out of defiance to god that sensual love caused pregnancy, followed by the increase of human progeny. Out of this pre-Augustinian rationale, Jesus had to be born from a virgin, a non-sexual occurrence, since in Heaven there was never any temptation of

¹³⁷ Fromm, *The Sane Society*, 35.

¹³⁸ Erich Fromm, *On Disobedience and Other Essays* (London: Routledge & Kegan Paul, 1984).

¹³⁹ *Ibid.*, 33, 34.

¹⁴⁰ *Ibid.*, 28–29.

¹⁴¹ Anthony Pagden, *The Enlightenment and Why It Still Matters* (Oxford: Oxford University Press, 2015), 91.

¹⁴² See Stephen Greenblatt, "How St. Augustine Invented Sex: He Rescued Adam and Eve from Obscurity, Devised the Doctrine of Original Sin – and the Rest Is Sexual History," *The New Yorker: Annals of Culture*, June 19, 2017. See also Stephen Greenblatt, *The Rise and Fall of Adam and Eve* (New York and London: W. W. Norton and Company, 2017).

sexuality or the means of procreation. According to Augustinian thinking, one should remain obedient to god, and couples should not enter into pleasurable sex. In his “obedient” mind, he did not want to acknowledge nor deal with the basis for sexual intercourse, pregnancy and bearing children and continuing the foundation of the human race.

Imitation and Obedience

Imitation and obedience in human life possess a two-fold paradoxical disposition: the push for *continuity-stability* on one hand and *stagnation* on the other. Religions and religious beliefs have persisted because of the imitation of generations, out of obedience to previous generations, due to the behavioral imitation characteristics of mammalian-primate life. The puzzle of imitation-obedience, in the case of the human species, is that the individuals sometimes behave contrary to their own interests, and instead act in the interest of a group, a loftier purpose, or loftier authority, and influenced by genes as well as by one’s own personality – a trajectory of herd-altruism prompted by the “selfish gene” for survival of its kind.¹⁴³ Imitation is nevertheless part of a survival pattern, and thus usually results in continuity.

The study of imitation offers its own set of scientific inquiries about the origins of the human mind.¹⁴⁴ The capacity of imitation, a mechanism from brain to behavior, is an indication of coding “self and other” in the brain. The imitation of others seems to demonstrate the same neuronal activities by the mirror neurons of the actor and imitator, as discussed in chapter 1. This phenomenon is theorized as a great leap forward in human evolution.¹⁴⁵ By coining the term *meme* (imitating behavior), Richard Dawkins intended to clarify that evolution can take place by the replication of genes on one level, and the replication of behaviors and their cultural transmission on another level without interfering with our brain biology.¹⁴⁶ This means, in the course of evolution of culture our anatomy and the core brain biology remained stable, but our behavior was modified. During this time our universal brain was rewired in a particular culture in order to both replicate behaviors and upgrade them to more socially complex level.

In the realm of human development, imitation has its invaluable side, since obviously the imitation of adults by children is what facilitates the acquisition of language and other learned human skills. Jean Piaget, the child psychologist, speaks of sporadic and systematic imitation of movement as well as higher forms of imitation, such as representational or deferred imitation

¹⁴³ Thomas J. Bouchard, Jr., “Authoritarianism, Religiousness, and Conservatism: Is “Obedience to Authority” the Explanation for Their Clustering, Universality and Evolution?” in Voland and Schiefenhövel, *The Biological Evolution of Religious Mind and Behavior*, 174, 175, 176, 177. For a broader biological definition of “selfish gene,” see Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1987).

¹⁴⁴ Wolfgang Prinz and Andrew N. Meltzoff, “An Introduction to the Imitative Mind and Brain,” *The Imitative Mind: Development, Evolution, and Brain Bases*, ed. Andrew N. Meltzoff and Wolfgang Prinz (Cambridge: Cambridge University Press, 2002), 1.

¹⁴⁵ Giacomo Rizzolatti, Luciano Fadiga, Leonardo Fogassi, and Vittorio Gallese, “From Mirror Neurons to Imitation: Facts and Speculations,” in Meltzoff and Prinz, *The Imitative Mind*, 247; see also Ramachandran, “Mirror Neurons and Imitation,” 3.

¹⁴⁶ See Dawkins, *The Selfish Gene*.

often interiorized from childhood onward as coordination and the absorption of mental images. Symbols and meanings slowly take shape.¹⁴⁷ Yet in the case of adult human psychology, once these human skills are mastered, imitation out of blind obedience leads to stagnation and degeneracy, which is detrimental to one's nature-given freedom and creativity during adulthood.

When living as a member of a larger community, the phenomenon of blind imitation of others without scrutiny of content is common. This is because imitation and obedience are nearly effortless tasks, easy to carry out, and they make it easier to avoid confrontation with the majority. Thus, imitating ancestral religions within the permitted boundaries, even following the strange beliefs of one's culture, does not seem unusual or odd. Even the oddest belief is in fact safeguarded because everyone else believes in it too, and it becomes a non-self-deciding ingredient guarded by the collective culture. Culture is made rather contagious by propagating ideas and beliefs.¹⁴⁸ Imitation is therefore a convenient, non-reflective way to handle one's environment. Imitative behavior also has its time-saving advantages: simply do what others have already mastered, such as certain behaviors, skills, tasks, knowledge, etc, rather than have to figure it out all over again. Yet when it comes to the critical matters of the human life story that determines one's destiny, freedom, intellectual integrity, and a deeper understanding of existence, more creative thinking is required, not just a duplication of other people's thoughts.

Nobel Laureate Daniel Kahneman argues that there are two dominant systems of thinking in humans: fast and slow, or Systems One and Two. System One, "fast thinking," which does not require analytical assessment and new judgments, is imitative thinking, a cognitively lazy and familiar way of rapidly responding to a situation. This rapid system of thinking comes from the memory of language, cultures, and images of ready-made responses from others without a deeper cognitive check of reality. This system of thinking can be clever, practical, and skillful, and yet can also be blind. Without any effort, one's ideas can be turned into beliefs of certainty, a type of pseudo-certainty that Kahneman refers to as the "illusion of certainty."¹⁴⁹ This is typically an imitative mind, partly a survival apparatus, and partly self-convincing redundancies of claims made by others without a reality check in the background, referred to as "useful fictions."¹⁵⁰ Religion falls in this category of thinking. Humanity in general bases its adult life on this system of fast-imitative thinking.

System Two, however, is "slow thinking," when one uses critical and creative thinking, a process undertaken recurrently by a small minority. It is a system of thinking that overcomes impulses, resists cognitive illusions, is suspicious of feelings alone, controls anger, examines facts, and makes better choices.¹⁵¹ System Two thinkers constantly use System One for practical purposes, whereas the persistent System One thinkers often fail or are oblivious to using System Two more

¹⁴⁷ Jean Piaget, *Play, Dreams and Imitation in Childhood* (1951; Oxon: Routledge, 2007).

¹⁴⁸ Tremlin, *Minds and Gods*, 149–150.

¹⁴⁹ Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux, 2011), 5.

¹⁵⁰ *Ibid.*, 23.

¹⁵¹ *Ibid.*, see Part 1: Two Systems and Part 3: Overconfidence, especially the chapters on "the Illusion of Understanding" and "the Illusion of Validity."

consistently. Kahneman points out that System One invents a story or a fictitious reality and tries to convince System Two thinkers to believe it, while in the meantime are unwilling to investigate it.¹⁵² System One thinkers and followers are endangered and can themselves become dangerous through manipulation and brainwashing by the deceivers.

Perhaps if the Aztecs, as “practitioners” of System One thinking with redundant and imitative beliefs under the “illusion of certainty,” instead of following the imitative belief of shedding human blood in order for the sun to rise every day had used System Two, thinking with some insightful contemplation, the results of their society would have been radically different. Many human lives could have been spared. They could have also been less vulnerable to the conquistadores, questioning rather than thinking the conquistadores were gods. This in mind, one could actually say that the history of South America could have turned radically different.

The calculus of imitation and obedience often times bears a greater conformity, utility and is less frightening, more reassuring. Due to mental tension, the propensity of fear focuses the mind on finding order, security, and a group of like-minded people to follow. Fear of god, fear of psychological alienation, and ironically fear of freedom, have always paved the way for a less anxious life of imitation and obedience. Religions and cultures perpetuate because of these factors, no matter what the components of a particular religion and culture are, even if completely illogical or absurd.

So, imitation and obedience play essential roles in maintaining culture and religion. In fact, imitation and obedience within a religio-cultural context have been survival tools, without which one would have had to constantly refer to critical thinking or new computations for new solutions, a rather exhausting possibility along with the danger of becoming a social outcast. The inclination toward imitation has seemingly brought a certain ease and consistency to human life. But the discomfort of blind imitation has caused inner tension between one’s own “split mind”: on the one side, one seeks conformity, consistency, and security; on the other, one searches for freedom, seeking an exhilarating dynamic mind with a stance against all the binding conventionalities. Sometimes, both of these tendencies overlap or subtly compete against each other, a sort of an inner tension and discord while one constantly measures oneself against the forces of the psyche and life circumstances and strategizes accordingly.

As our human ancestors became aware of and wondered about death, that death seemed to be a loss of connection with reality where one becomes unreal and therefore joins nothingness, a certain sense of *meaning* had to be created. But meaning often stood higher than freedom. A life lived with “meaning” by following a god and imitating one’s parental culture seems to be more gratifying than living a free life but (seemingly) empty of meaning. As Keiji Nishitani extrapolates, there was a time when ego came to save humans and prevented nihility and the laws of nature from degrading human life, even though all things in the world symbolized

¹⁵² Ibid., chapters, 17, 19, and 20.

nihilism and death.¹⁵³ By inventing stories, the nothingness of life changed to something, to meaningful living. The stories sometimes promised a glorious return to life, an eternal homecoming. This myth-making scenario turned the existential anxiety of nothingness into purposeful living. Telling each other thousands of untruths (which felt true) helped to curb emptiness and boredom. It was this paradoxical performance that led on one hand to finding structure through obedience to the messages in these stories, and on the other to living with the derailment of one's own dynamic and evolutionary mind – living in self-deception for the sake of feeling good.

Both Daniel Dennett and Richard Dawkins in addressing the question of “purpose” have emphasized two types of purposes for survival: “arche-purpose” which is nakedly instinctive and serves existential survival. The other is “neo-purpose” which the individuals build upon the arche-purpose to satisfy their “why” question. The ‘why’ question for the appearance of the universe and its direction has no definitive answer. It does not seem any non-human animal would be engaged with the “platonic” debate of “arche-purpose” let alone “neo-purpose”; this question is instead an emanation of the human being’s tool-maker mindset, a mind that cannot even comprehend where its own competency of making tools comes from (borrowing Dennett’s idea).

People fabricated a meaning for life by making myths about the hidden dimensions and intentions of the world. In these myths, humans were promised to have a higher place than this world. Many similar thoughts were replicated and followed for millennia. The exaggerations reached their peak at a time when rational thinkers and naturalist philosophers could no longer condone such astonishingly dramatic and fictitious accounts of reality and were arguing against their fabricators and imitators. It became clear to them that these fictitious stories clashed with the reality of complex life and the integrity of human mind. Despite this, the fictitious, religious interpretations of the reality of life continued to satisfy some audiences, while the rational interpretations satisfied others. It is said there are times when the mind of the myth-maker perceives things that the intellectuals fail to perceive.¹⁵⁴ At the same time, the mind of the intellectual perceives the immeasurable power of nature and the infinity of life which cannot and does not remember all the personal, culture-based, religion-based stories, even though “meaningful” in their own way. This is when the intellectual sees things that the myth-maker and unseeing imitator has failed to see.

Fear was the key premise of generating religions, making up stories, erecting gods to worship, and creating an indisputable system of obedience. Imitating the traditions of their ancestors kept people captive to themselves. The hyperbolic attitude of religious obedience however remained so anticlimactic that it prompted the maverick Prometheus, a Titan and a friend of humanity and

¹⁵³Keiji, Nishitani, *Religion and Nothingness*, trans. Jan van Bragt (Berkeley: University of California Press, 1983), xxxiii, 7, 11, 47, 85, 88, 93, 230.

¹⁵⁴ *Ibid.*, 239.

enemy of the god Zeus, to say, bringing a tremor to the priests and the followers of Zeus¹⁵⁵: “I would rather be chained to this rock than be the obedient servant of the gods.”¹⁵⁶

Conclusion

The quintessence of myths out of which religions emerged has in some ways been useful for many frightened people throughout history. Hundreds of religions have formed around the globe to accommodate communities in dealing with their psychological fears and hopes, to give meaning to their lives, and even offer the promise of an afterlife, whether a life in heaven or a virtuous reincarnation. Religion has also fulfilled a social component, connecting people on a wider scale – an adaptative (or perhaps maladaptive¹⁵⁷) human behavior passed on through culture.¹⁵⁸ It has given a sense of community, a broad and biologically-psychologically-linked kinship social cooperation,¹⁵⁹ a feel-good sense of a place in which to share space with like-minded people.

However, religion, perhaps involuntarily due to fear, was embarked upon to offer a path not for actually understanding the world and themselves, but to do precisely the opposite – to obscure the world with anthropocentric fictional tales, comfortably leaning on it through faith for thousands of years. Many conventional or mythical “truths” under the flag of religion deal with the same archetypal fear of the unknowable. Parochial cognitive faculties of human ancestors produced sketchy approximations of life and reality, something that suited their truth-seeking efforts and psychological requirements of their days, but blocked them from a rational understanding of the world and themselves and each other. Self-analysis and empirical investigation of the world have had less value in various religious traditions than a surrender to own emotional construction of reality, to the tenets of faith and to the calls of higher authorities. Imitation-obedience has generally been easier for the human brain. In some sense as James C. Scott puts it, “the spread of sedentism transformed Homo sapiens into far more of a herd animal than previously.”¹⁶⁰ And cultures, as Daniel Quinn mentions, became large “prisons” that no one, whether rich or poor, could escape.¹⁶¹ The brain was separated from nature due to its laziness and irrational anxieties.

¹⁵⁵ Campbell, *The Masks of God*, 281.

¹⁵⁶ See Fromm, *On Disobedience*, 1.

¹⁵⁷ Richard Dawkins argues religion and religious ideas are maladaptive especially when they are passed on to children who cannot make their own decision. See R. Dawkins, *The God Delusion* (London: Bantam, 2006).

¹⁵⁸ See Peter J. Richerson and Lesley Newson, “Is Religion Adaptive? Yes, No, Neutral, But Mostly, We Don’t Know,” in *The Evolution of Religion: Studies, Theories, & Critiques*, ed. Joseph Bulbulia, Richard Sosis, Erica Harris, Russell Genet, and Karen Wyman (Santa Monica, CA: Collins Foundation Press, 2008), 61–66. They argue against Dawkins’s analysis of maladaptive notion of religion, considering it too simplistic.

¹⁵⁹ See Bernard Crespi, “The Kin Selection of Religion,” in *Oxford Handbook of the Evolution of Religion*, ed. J. M. Liddle and T. Shackelford (in press), 15–16.

¹⁶⁰ Scott, *Against the Grain*, 83.

¹⁶¹ Daniel Quinn, *Ishmael: An Adventure of the Mind and Spirit* (New York: Bantam Turner, 1992), 252. The conflict of human’s instinct with the demands of culture has been a theme visited by various thinkers. See Konrad Lorenz, *The Waning of Humaneness*, trans. Warren Kickert (Boston and Toronto: Little Brown and Co., 1987), 129. Lorenz specifically refers to Kant and Schiller. Freud also addressed this conflict thoroughly.

And so, despite religion's utility for certain people, critical philosophers and thinkers have been arguing that fear and religious thinking distort reality. This process of reality distortion was encompassed in the powerful process of myth-making.