

Faith

Supernatural Beliefs

and

Our Symbolic Brain

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PREFACE

At a teacher's conference for Emily, who is in kindergarten, Ms. Jorden says to Emily's mother, "I think it's time you let Emily know that the Tooth Fairy and Cinderella do not really exist, because she keeps talking about them as if they were real people. I believe it's important for children to know the difference between fantasy and reality." Emily's mother, Mrs. Grey, tells Ms. Jorden that there is time enough to puncture Emily's fantasy world and that she'll do this when she thinks Emily is ready. "I think she's old enough now," voices Ms. Jorden. Mrs. Grey replies, "There are adults who still believe that angels exist and it hasn't done them any harm." Ms. Jorden now realizes that she is in for a debate and makes the first strike by telling Emily's mother that the Bible proclaims that angels do exist but says nothing about the Tooth Fairy or Cinderella. Mrs. Grey counters by remarking that not everything in the Bible can be taken literally and some of the stories and actions of the biblical characters are meant to be metaphors. After this exchange they both begin to realize that neither one is going to come out ahead and they depart with a friendly "thank you" and "goodbye."

As a psychologist I realize that our brain can hold on to both fantasy and reality at the same time and that sometimes it's hard to know which is which. Belief in reincarnation, an afterlife, and astrology are prime examples. This dilemma intrigued me and made me wonder why people hold on to supernatural

beliefs or seek supernatural paths. From a historical perspective, supernatural beliefs have been with us since recorded history and even before. From an evolutionary perspective, it appears that supernatural beliefs may have been a way to deal with anxiety, fear, and stress and thus favored by natural selection. My book, in fact, looks at the supernatural from both a historical and an evolutionary perspective and answers the question of why supernatural beliefs continue to exist in the twenty-first century.

This required research into the accepted beliefs of ancient Egypt, Greece, China, and India and whether any of these beliefs are still accepted. I tried to tackle the project by imagining how people handled physical illnesses and what cures were offered, and whether their trust and faith in their healers played a part in their recovery and survival. People did survive long before medical science made its appearance, so it was and still is important to know what affected their recovery and survival. How well I imagined the people in the ancient world rests with the readers of the book, but I believe I did a pretty good job. I am sure that people who are interested in speculating why supernatural beliefs continue in this century would learn much from reading this book. Its novel approach and conclusions would benefit the intellectual pursuits of readers who want to take on the challenge of understanding how our brain determines what is fiction and what is nonfiction. Sometimes this is not an easy task, but it is worthwhile.

ACKNOWLEDGMENTS

I would like to thank the many people who were willing to read and give me feedback about the rough drafts of the book by writing down their evaluations, correcting mistakes, and making encouraging remarks that helped me keep going. Some, like me, plodded through, chapter by chapter, and some gave me specific information about questions that came up. Others just offered an opinion about the book's content.

Family members, colleagues, and friends all pitched in to help. My wife, Verna, a busy attorney managing the pro bono program for the county bar association, was the first one, who was always willing and ready to read the first draft of every chapter and to give her opinion about its strengths and weaknesses. Then came Louise Ross, my cousin, who is the Publication Coordinator for the Joslyn Center, who corrected spelling mistakes and sentence structure and told me whether or not the content held her interest. My son Ken, who is a CPA and owns his own business—along with his partner Ed Costello—helped me out with a percentage question that was relevant to the premise of the book, and my daughter added her opinion about the book's content when I first began writing. Two of my psychological colleagues, Gil McFarlane, who is a Senior Psychologist at Ventura County Behavioral Health, and Richard Reinhart, formerly Chief Psychologist at Ventura County Behavioral Health and now in private practice, were very helpful in their critiques of the psychological premises and conclusions throughout the book and spent many hours going over all eight chapters. I certainly appreciated their input. And one of my childhood friends, Ronald Massarik, who practiced internal medicine and is now a retired physician, willingly read several chapters and provided feedback about the medical aspects of the book's contents. In addition, a neighbor, Brad Guzikowski, who was enrolled in a

psychology course at the local junior college, provided a student's viewpoint of the first two chapters.

Finally, the students in the Secular Student Alliance group at Northern Arizona University, under the leadership of Miles Schneiderman, provided feedback on how well the contents fit the premises involved, whether their belief in atheism could be reconciled with the book's conclusions, and how interesting they found the book.

The various perspectives from all the people involved in looking over the book's premises and content kept me on the right path and allowed Eric Larson, who has a business in Santa Barbara called Studio e Books, to edit *Faith, Supernatural Beliefs and Our Symbolic Brain* before sending it to be published. Much appreciation goes to him for the professional job that he did.

TABLE OF CONTENTS

Introduction	1
Chapter I Creating and Reacting to Signs, Signals, and Symptoms in Animals and Man.....	5
Chapter II Creating and Reacting to Symbols and Symbolic Systems.....	19
Chapter III How Belief Affects Your Physical and Psychological Well-Being.....	39
Chapter IV Faith, Supernatural Beliefs, and Their Impact on Human Well Being.....	57
Chapter V Supernatural Beliefs and Natural Selection.....	77
Chapter VI Supernatural Beliefs and Human Survival.....	91
Chapter VII Professional and Societal Reactions to Supernatural Beliefs.....	107
Chapter VIII Control, Power, and the Supernatural.....	131
References	157

INTRODUCTION

The world as we know it is not a symbolic one. When a tornado is headed toward a city, weather forecasters don't say, "based on the tornado's actions it looks to be only making a symbolic gesture and should do no actual damage," or when a bear is headed toward your table, which is loaded with food, a ranger nearby is not apt to say "don't panic, the bear looks like he's only making a symbolic gesture." The world we are exposed to has stars, oceans, rivers, volcanoes, trees, and hurricanes. It is also full of life, with different species interacting with each other. Some are predators, like hawks, eagles, and wolves, and others are non-predators that attack only nuts and berries. We are part of this world and are conscious of how vast and complicated it is. However, it is a world full of actual items, not symbolic ones, and astronomers have yet to describe the "big bang" as a symbolic event as opposed to a real one.

While it took evolution billions of years to accomplish, we have been endowed with a brain that understands, creates, and communicates in symbolic terms. This has led to children picking up and speaking one or more languages at an early age and learning to read, do math, and create artwork in grade school. So we are put in a non-symbolic world and yet we have to understand and explain it with symbolic models and formulas that can be passed down to our children. This is unique to human beings. Indeed, we think, create, and communicate symbolically. Our brain is

programmed this way. It has allowed us to create symbolic systems like language, mathematics, musical notation, and other artistic creations. There seems to be no end to what we can imagine and create.

Natural selection has seen fit to view our symbolic brain in a favorable light. It has allowed us to produce and distribute food, kill with weapons of our creation, build shelters, travel anywhere in the world, develop medical systems that take care of pregnant women and newborn babies, and create societies that sustain our lives and property. This bodes well for our reproductive sustainability and our continued survival.

However, there is another side to this positive story about our symbolic brain. It is open to reality and nonfiction as well as to fantasy and fiction. Our imagination can solve problems or take us on a wild ride to Neverland. It is boundless in its creativity and takes in both our real and dream worlds. It can go astray and produce illusions, delusions, and hallucinations. Our not-too-distant past is full of myths, legends, magical beliefs, false models, and racist stereotypes. And what we believe has profound effects on our health, well-being, and future. So, the picture of our symbolic brain seems to be both positive and negative.

As one can see, it is not always easy to distinguish between the real and the fanciful ideas and models that our symbolic brain creates, because what we believed three thousand or

even three hundred years ago has radically changed. We no longer believe the earth is flat, that we are the center of the universe, or that illness is caused by demons who enter our bodies or by an angry god. Yet the same questions that confronted us before about what is real and not real keep popping up. Do ghosts really exist; is there an afterlife; can prayer cure disease; can we communicate with the dead; will we reunite with dead family members after we die; is there a God who knows we are here and cares about us; and are there other, similarly intelligent creatures in the universe?

From an evolutionary standpoint, we could ask, if animals couldn't distinguish between reality and fantasy, how long would they last? Probably not very long, unless the fantasies had some survival value. This to my mind is a major question. Does our belief in the supernatural have any survival value? Does it help us in any way and if it does, in what way? My book attempts to answer these questions by looking at our innate nature, our past beliefs, our myths, and how our symbolic brain functions. And it reaches a conclusion. My hope is that you'll reach the same one.

CHAPTER I

Signs, Signals, and Symptoms

in Animals and Man

Becoming Alert

On July 29, 2008, I was in the kitchen of my home making some toast for my breakfast. Standing next to the counter on which the toaster rested, I suddenly felt as if I were standing on an unstable, shifting floor. Or was the floor stable and I shifting? I wasn't sure which one it was. I began to wonder if I was having a dizzy spell or another episode of vertigo like the one I had had some time ago. And then I noticed that the curtains on the sides of the kitchen window were swaying back and forth. This made me realize that it was the ground that was shifting and not I, and that an earthquake was taking place. The shifting floor and swaying curtains, taken together, were the signs my mind needed to be convinced that an earthquake was underway. My conviction was confirmed when I turned on the radio and heard that an earthquake had just hit in the greater Los Angeles area near the city of Chino Hills in San Bernardino County.

Sometimes survival depends upon knowing what signs and signals to look for when disaster strikes. The Moken people of Thailand—known as the Sea Gypsies—were virtually unknown to the outside world until the 2004 tsunami hit Southeast Asia. While they have no written language and no recorded history, their

grandparents and parents had passed down an important message based on past experience with the sea. They knew a receding sea was a sign or signal that a tsunami was on its way. They all took refuge in the mountains, and they all survived—unlike the thousands of people along the coast who perished, not knowing that a receding sea was a sign of a coming tsunami.¹

Unlike traditional peoples with their natural signs and signals, city-dwellers are beset by beeping horns, howling sirens, flashing lights, traffic signals, turn signals, car alarms, smoke alarms, alarm clocks, cell phone tunes, whistling tea kettles, gas smells, and barking dogs. There are also signals and symptoms from our bodies that protrude into our consciousness. Feeling energetic, feeling tired, getting hunger pangs, becoming thirsty, becoming nauseous, needing to go to the bathroom, feeling pain, experiencing anxiety, and feeling ill are among the many signs and symptoms with which we become familiar as we mature. We then have the task of making our children more and more aware of the same urban and bodily signs, signals, and symptoms.

Built-In Programs

If you own a pet, you become aware of all the places it wants to sniff and explore. With acute senses of smell and hearing, animals are programmed to pay attention to signs and signals that pertain to their survival, physical well-being, and freedom of movement. Bring out a leash, and your dog knows this is a sign or

signal that it's time to go for a walk. If there's a tree around, or the scent of another animal, the dog will stop, sniff, and leave its own deposit to mark its territory. Sometimes a dog will find a scent and follow it in tracking behavior. With their keen sensitivity to signals, dogs can be trained to guide blind people across busy streets, detect illegal drugs, find buried bodies, and sense when a person is about to have an epileptic seizure. Their keen senses can also be a detriment in our noise-filled society. I once owned a German shepherd who would run and hide whenever he heard a loud, sharp noise like a car backfiring, a cap pistol going off, or exploding fireworks. If this dog was ever in a forest and a gunshot went off, he would find a hiding place where nobody would easily find him. This might serve as a survival strategy for a wild dog, but it wasn't very good in a city full of booms, bangs, and backfiring cars. Throughout the three and a half billion years that life has been on earth, organisms have evolved the ability to sense and respond to signs and signals from the external environment and from their own bodies, which increases their chances of survival. This is true for both one-celled organisms and for humans. For example, a report from the Science Library at the University of Albany on how bacteria use signals states:²

Instead of language, bacteria use signalling molecules which are released into the environment.

As well as releasing the signaling molecules, bacteria are able to measure the number (concentration) of the molecules within a population. Nowadays we use the term "Quorum Sensing" (QS) to describe the phenomenon whereby the accumulation of signalling molecules enables a single cell to sense the number of bacteria (cell density).

QS enables bacteria to co-ordinate their behavior. As environmental conditions often change rapidly, bacteria need to respond quickly in order to survive. It is very important for pathogenic bacteria during infection of a host (e.g., humans, other animals, or plants) to coordinate their virulence in order to escape the immune response of the host in order to be able to establish a successful infection.

Recognition of Self and Non-Self

Detecting and sending signals are two fundamental activities of all life. One of the basic signals or signs that living organisms search for is whether another organism is the same as or different from itself. This hunt for sameness was recently discussed in the journal *Science* with regard to bacteria living in colonies: they formed boundaries between colonies of different strains but merged with other colonies of the same strain. The authors state that in order to form these boundaries, bacteria

must be able to discriminate between self and non-self groups, and that certain genes provide them with the means of decoding chemical signals that allow them to make this distinction.³

Discrimination between self and non-self is also performed by the guardians of ant colonies. Like the bacteria, the guards depend on reading chemical signals that other ants exude. One study suggests that ants rub their antennae over each other to determine whether they are self or non-self members.⁴ James F. Lynch, a zoologist at the Chesapeake Bay Center for Environmental Studies, names two other ways that ants stop non-self members from entering their homes. One species of carpenter ant makes its nest in hollow plant stalks or tree limbs, in which small entry holes have been made. The colony raises guard ants whose heads, "shaped like bottle corks," exactly fit the holes. The guards plug the entrances with their heads and will not withdraw until a returning colony member gives a tactile signal to identify itself. A second method of keeping out intruders depends on recognizing the odor of the ant colony in which an individual resides, since colonies have distinct identifying odors.⁵ Without the ability to detect and transmit signals, the colony's survival would be short-lived.

Since we humans live in a world teeming with microorganisms, we have been provided with a biological immune system—thanks to evolution and natural selection—that also depends on the process of discriminating between self and non-self entities in order to protect our body from invading pathogens. This ability is basic to

our survival, and has been basic to the survival of all forms of life. The medical profession has to take this survival mechanism into account when it attempts to transplant organs from one individual into another, since the immune system attempts to destroy non-self material. The similarity between the way we protect our bodies from intruders and the way bacteria and ants protect their colonies is a sobering thought when contemplating our supposed uniqueness. We all face similar challenges and nature has provided similar responses to help us survive.

The Process of Association

The ability to detect and respond to the signs, signals, and symptoms that alert us to danger underlies our power to protect, preserve, and enhance our life and physical well-being, as well as our property and possessions. And we comprehend the danger by its emotional impact on us.⁶ Take the process of conditioning that the Russian physiologist Ivan Pavlov discovered with dogs. They first salivated when powder was put into their mouths, then they started salivating at the mere sight of the food and, later, at the sight of the assistant who brought the food, and then at the sound of the assistant's footsteps.⁷ The ability to associate a given sign or signal with a particular outcome is one that children develop early on and it persists throughout life. A child associates a white dog with a loud startling noise several times, and soon the white dog becomes a frightening animal. This can even spread to

other white animals or other white objects. It can even develop into a phobia.⁸

In fact, this process of association is at the heart of science, which investigates cause and effect. The sun sets and the sky gets dark; we see smoke and then we see fire; we put pure sodium in water and an explosive reaction takes place; astronomers look at the stars and galaxies and notice they are retreating every day and every year that they are observed. Medicine and psychology also use the process of association to attribute certain symptoms with certain diseases. Diagnoses stem from such associations. For example, severe abdominal pain initiates a search for a diagnosis that includes an analysis of temperature, blood pressure, pulse rate, and urine composition, followed by X-rays. If nothing specific can be diagnosed, physicians start thinking about psychological causes.

This is in fact what transpired when I took my wife to the emergency room of a local hospital. An on-call physician, after performing an examination and finding no physical cause, prescribed a tranquilizer to help her with the psychological stress that he assumed was causing the pain. I knew how my wife responded to stress, and this was not one of the ways, as far as I was concerned. I kept calling—it was after hours—and I finally got hold of one of the partners of my wife's primary physician. He met us in the emergency room and ordered an abdominal X-ray and a blood test. After looking at the results, he concluded that she

had an intestinal obstruction. A surgeon who specialized in abdominal surgery was located, and she was operated on at two a.m. in a life-saving procedure. Once again, knowing what signs, signals, and symptoms to look for can mean the difference between surviving and not surviving.

Diagnosing psychological disorders also depends on recognizing symptoms and determining if they fall into normal or abnormal behavior patterns. Take the diagnosis of a compulsive disorder for individuals who overdo shopping or gambling. The clinician has to decide if: (1) the person feels driven to perform the activity; (2) the behavior is aimed at reducing distress or preventing some dreaded event or situation; (3) the person recognizes that his behavior is excessive or unreasonable; (4) the behavior significantly interferes with the individual's normal routine, occupational functioning, or social relationships; and (5) the disturbance is not due to drugs or a medical condition.⁹ Unlike the medical tests that pinpoint abnormalities in blood cells or intestinal function, the diagnosis of psychological disorders depends on looking at behavior and judging when it has become excessive, interferes with so-called normal functioning, or produces distress. So, when a given behavior is defined as a clinical symptom depends to a great extent on whether the behavior is considered distressful or disturbing.

Making Models and Using Signals_

The principle of cause-and-effect is the conceptual foundation of science and its various branches including astronomy, chemistry, biology, medicine, and psychology. After observing certain sequences of events over and over again, experiments are performed that break the events into smaller pieces. This helps to understand the sequences in more detail. The goal is to come up with a conceptual model that explains observations, has predictive power, and can help with human endeavors. Some of the most famous conceptual models are Einstein's equation $E=mc^2$, Watson and Crick's double-helix model of DNA, and Darwin's theory of evolution. Humans seem to be driven by a never-ending quest to make new discoveries and find out how things work.

I believe the motivation for this comes from our built-in need to protect, preserve, and enhance the lives, possessions, and identity of ourselves and those individuals and groups we love or are bonded with. We also want to know if life exists elsewhere in the universe, so astronomers send signals out into space in hopes of reaching other life forms, who will detect the signals and send back their own replies. Just as bacteria use signal-detection and communication to find out whether any comrades are around in their host, our most educated astronomers use signal-detection and communication to find out whether any comrades are around in the universe—which can be considered our host.

Built-in and Learned Sensing and Responding

Throughout the plant and animal kingdoms, responses to certain signals seem to be built in. When a fly gets caught in a spider web and struggles to escape, the vibrations produce an immediate and orchestrated response from the spider. The Venus Flytrap responds to insects landing on its leaves and stimulating its sensitive hairs by folding its leaves and trapping them.

A recent report in *Science* informs us that in threatening situations the secretion of alarm pheromones is widely used throughout both the plant and animal kingdoms. The most recently discovered location for pheromone secretion in mice is at the tip of the nose. The authors state that "pheromonal communication plays an important role in social interactions among individuals of the same species, affecting in particular sexual, territorial, and maternal behaviors." They conclude that sensitivity to alarm pheromones is present both in primitive organisms such as worms and in humans as well.¹⁰

Smell is crucial to the survival of many animals, especially those in frigid territories. Reindeer, for example, have such a keen sense of smell that they can detect plants that are buried under the snow and can pinpoint the location of a mushroom one hundred yards away.¹¹

Even at home we can see that signs and signals are widely used. For example, a variety of wild birds come into my backyard to use the feeder, and something heard or seen sends them off all

at once in a mass movement, as if they were tethered together. The postman comes to deliver the mail, and all my dogs are at the front door barking their heads off as if he were a threat.

Of course, many signals are learned through the process of association, as when dogs learn that taking out a leash is a signal that they are about to be taken for a walk, and when children learn that a certain tune coming from the street is a signal for the approach of the ice-cream man. Adults have learned to be aware of the smell of gas leaking from their stoves and that a continuous beep, beep, beep late at night is connected to an annoying car alarm going off somewhere nearby.

Missing an Important Signal

I remember an experience my wife and I had when we were living in a rented house while I was going to graduate school at the University of Arizona in Tucson. We owned a dog named Buddy, who was friendly with a dog down the street called Sally. Sally's owner would allow her to visit us on her own and she and Buddy would play together until supper time; then we would send Sally home by pointing her in the right direction and saying quite loudly, "Go!" This was enough to send her back. Well, one evening, long after supper, we heard barking outside our house, and lo and behold there was Sally. We yelled at her to go back home, but she didn't respond and kept barking. We kept yelling and she kept barking, so we went out and pushed her in the direction of her

home and encouraged her to return home in no uncertain terms. She reluctantly started back home, then turned around as if to come back, but we kept insisting she go back home. We finally succeeded in sending her home, but we wondered why she had been so persistent in getting our attention at such a late hour. Our wondering was answered the next day, when we found out that the woman who owned Sally had been held at knife-point by an intruder who tied her up and robbed her house. Apparently Sally had been sending us a signal that something was wrong—a signal that we ignored. To this day, I regret not paying more attention to Sally's persistent barking. I responded to it as something annoying rather than as an alerting message.

Sexual Readiness Signals

In retrospect, signals have been used by living organisms for their survival since the beginning of life, which goes back some three and a half billion years—a billion years after the earth was formed. Protection, preservation, and enhancement of life and physical well-being have been served well by the use of signals, signs, and symptoms. While protection of the body is an evolutionary imperative, life couldn't continue without reproduction. Sexual signaling has therefore become an important part of mating and reproduction.

A report given by veterinarian Karen Overall at the Atlantic Coast Veterinary Conference held in Atlantic City, New Jersey,

highlighted the extent to which non-verbal signaling is used by all social vertebrates to indicate sexual desire and readiness as well as to negotiate other social interactions. Visual, tactile, vocal, olfactory, and pheromonal signals are all used. Dr. Overall stressed the importance of realizing that signaling involves a set of rules that will be shaped by the evolutionary history of the species.¹²

The courtship and mating rituals of birds are great examples of the variety, timing, duration, and holding power of signals. Singing, color displays, aerial acrobatics, rhythmic drumming, aggressive actions, and courtship feeding are just a few of the ways male birds try to attract mates.

Once a male produces his arsenal of pay-attention-to-me signals, it is up to the female to accept or reject the suitor in question. Tanagers and orioles are noted for their brilliant color displays; mockingbirds can keep up their lyrical songfest all night long; woodpeckers drum with their bills on dead limbs; nighthawks dive down toward their prospective mates, producing a booming sound; and the marsh hawk's aerial dips and somersaults are well known by bird watchers. The courtship dance of the whooping crane is performed by both males and females, each bowing to its mate, leaping high in the air with its wings flapping, and then bounding up and down. In courtship feeding the male places the food he has collected—insects, berries, fishes, nuts, seed, or whatever—directly into the open mouth of the female, and this

apparently acts as a kind of sexual stimulant; males of the yellow-billed cuckoo, for instance, even feed their mates while copulating with them.¹³ As far as anyone knows, courtship feeding is not performed by any other vertebrates, except for its occasional practice by humans.

While food can act as a sexual stimulant, its main use in the animal kingdom is in nourishing the body and keeping animals alive and healthy. Because of its importance for survival, conflicts can develop within animal groups when food is scarce or when not every portion is equally palatable. In most cases the animal with the highest status or the greatest strength wins the conflict. Such is the case with our nearest relative, the chimpanzee, whose social group is dominated by an alpha male and his coalition partners. Members with higher status rule those with lower status, and when a female comes into estrus the alpha male has first choice in mating with her. Unlike the chimpanzee, the bonobo—an offshoot of chimpanzees—settles food and other conflicts with sex. Bonobos indulge in much genito-genital rubbing, and copulation lasts an average of thirteen seconds. So when situations arise that might lead to conflict, bonobos use sex to divert attention and settle the issue peacefully.

Humans, like bonobos, use sex for purposes other than procreation. And like humans, bonobos use rubbing and tongue-kissing as signals of readiness for more sexual activity.¹⁴ It almost seems as if humans have picked up some of the bonobo genes!

Life has been well served by signals, signs, and symptoms, for they have been able to keep life going for three and a half billion years. So what brought symbolism into being? Why do humans need it, and how does it differ from signals, signs, and symptoms? These questions and how symbolism relates to the supernatural will be discussed in the coming chapters.

