

# **The Invention of Religion**

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## **A Note on the Text**

Part 1 will make very little sense unless it is read in order, beginning with the introduction. So readers are greatly discouraged from skipping around, although the intercalary chapters with headings of “On ...” can be read in any order without losing coherence.

Part 2 can be read at any time and in any order.

## Part 1





# Chapter One

## Introduction

This work sets out to prove that, in the absence of knowledge, humans will invent a religion.

Over the course of the book, we will investigate certain *psychological phenomena* to see what aspects (behaviors, ideas, etc.) they cause in man and then show that four *key aspects* combine and evolve into what we think of as religion.

We will begin by investigating the psychological phenomena that cause each aspect of a religion to take form, but these will form what we will call the *basis* of a religion. What this means is that the elements of the basis form the underlying elements of the religion and as time passes and more people are introduced, the religion evolves to include more adaptations (see Chapter Six: The Evolution of Religion).

To show this, we will invent an imaginary Man on an Island who has encountered no religions nor science. Then, through a series of thought experiments, we will see what effect various psychological phenomena will have on him, which will ultimately show us how the key aspects of religions are formed.

Now since we know where we are headed, we will make some definitions ahead of time that agree with our conclusions (for now we are supposing these definitions are accurate and then throughout our investigations we will show that they are accurate). For our purposes, we will define the basis of a religion as *any set of beliefs that contains rituals, deities, and an afterlife that includes the concept of a soul*. And when these beliefs evolve and are combined with etiological stories, they form a religion.

From our definition of the basis of a religion, we find the *four key aspects* of a religion, *rituals, deities, an afterlife, and souls*. We will further define ritual to be *a prescribed set of ceremonial behaviors*; a deity to be *a being who is worshipped and has authority over certain aspects of life*; souls to be *the animating essence of a person that distinguishes them from others*; and an afterlife in which *the soul separates from the physical body and survives the death of the body*.

Now we also need to make some definitions regarding the Man on an Island. We will call our Man on an Island *completely naïve*, which we will define as having had no prior experience or knowledge. And he is also a *normal observer* which we will define as being in a state in which all his knowledge comes from his own direct observations

and that he would make the same deductions from what he observes as any normal human would (this means that all the psychological mechanisms that we will investigate also apply to him). But we will also say that the Man on an Island is not necessarily one man, but can be lots of men that extend over generations or millennia and share their experiences through language. And we will see how the sharing of experiences through language evolves a religion in Chapter Six: The Evolution of Religion.

The Man on an Island will therefore serve as a model for what humans are like whenever they lack science and religion (or in other words, whenever they exist with an absence of knowledge), which means he also serves as a model for early man. Of course, early man wouldn't necessarily have been *completely naïve* like the Man on an Island, but since we are performing a thought experiment we want an idealized environment so that we can analyze what observations and deductions the Man on an Island would make without any confounding variables.

Throughout the course of this book, the typical method of each chapter will be to present experiments that demonstrate certain psychological phenomena that are related to each key aspect. The reasoning behind this is that, when experiments are performed correctly, they untangle cause and effect relationships.

An easy way to study cause and effect is to deliberately cause a change in a variable (the *independent variable*) and measure the effect it has on another variable (the *dependent variable*). The way to measure the effects that the independent variable has on the dependent variable is to use a *control* sample which is identical to the experimental group except that the independent variable is not introduced to it. For example, to test the effect of a drug (the independent variable) on people's memory (the dependent variable), one randomly selected group would be given the drug (the *experimental* group) and another equally random group would be given a placebo (the control group); then a memory test would be given to both groups and the scores would be compared between the two groups. And if there is a *statistically significant* difference (which means that it is unlikely that these results occurred by chance) between the two groups, then the drug has an effect on memory.

In this way, control groups are used to eliminate alternate explanations of the results that come from performing the experiment because they show that the effect on the dependent variable does not happen in the absence of the independent variable. Moreover, controlled experiments establish that the reason for something happening can be directly pinpointed to a cause, such that any time that particular independent variable is introduced, there will be the same effect on the dependent variable.

So we can see that once we have established a cause and effect relationship for a psychological phenomena that is related to one of the key aspects, we will know how this aspect will take form in the Man on an Island and therefore also in early man.

A Note: This doesn't mean that these psychological phenomena are what *make* people religious, they are what caused early humans to *invent* religions. For example, someone can still be religious and not think the world is just (see Chapter Five: The Afterlife).

We will proceed with a chapter for each of the four key aspects, followed by a chapter explaining how these aspects evolve into a more cohesive whole. Then we will show that today's major religions could have been formed from the four key aspects. And finally we will examine whether there is evidence that morality and life can originate without the intervention of deities.

## Chapter Two

### Ritual

*A prescribed set of ceremonial behaviors.*

This chapter will show that ritualistic behavior is a direct consequence of *non-contingent reinforcement*. *Reinforcement schedules* are a feature of *operant conditioning*. The story commonly associated with conditioning is Pavlov training dogs to salivate at the sound of a metronome; however, that is an example of classical conditioning, which deals with the modification of involuntary behavior. Operant conditioning is the form of conditioning dealing with voluntary behavior.

Dog training is an easily observable form of operant conditioning. The trainer has a desired *behavior* in mind, like shaking hands, and uses treats to *reward* that behavior. By rewarding the dog's behavior, the trainer increases the likelihood of that behavior being repeated and if the behavior is paired with an *instruction*—like saying, “Shake,” or holding out your hand—then the dog will learn to follow the instruction with the desired behavior. This is the basic character of operant conditioning: *a behavior is rewarded or punished to respectively increase or decrease the likelihood of it happening again*; and an instruction can serve as a *discriminative stimulus*, which indicates by its presence that the paired behavior will be rewarded.

Operant conditioning is the only way that anything is learned. But the factors involved are not always as easy to see as in situations like giving a dog a treat for shaking your hand. Because, say for example you are trying to learn Calculus, and the problem asks you to differentiate an equation (the discriminative stimulus), then you execute the problem (the behavior), and finally you check the answer in the back of the book—and if your answer is correct, you get a feeling of satisfaction (the reward), and if your answer is wrong, you get a feeling of disappointment (the punishment). The reward encourages you to continue doing Calculus problems that way and the punishment encourages you to stop doing them that way. And, obviously, the reward has to be something the learner desires (or else it would by definition not be a reward), which is why it is difficult to teach Calculus to a student who thinks Calculus has no point, since solving problems correctly would give very little satisfaction for them (and therefore not much of a reward). Thus, operant conditioning shows that the likelihood of a behavior being

repeated depends on the past reinforcement or punishment received for performing that behavior; and that reinforcement only increases the likelihood of behavior when the reinforcement is something desired.

Operant Conditioning is normally studied using the Skinner Box—named after B.F. Skinner—which in its simplest form is a windowed container for a rat with a lever that the rat can press to dispense a pellet of food. Once the rat is trained to press the lever, schedules of reinforcement can be introduced. In the case of lever pressing, this means *how many times the lever has to be pressed before a pellet of food comes out* or *how much time has to pass before pressing the lever delivers food*. Thus there are schedules of *ratio* and *interval* with the reinforcement being either *fixed* or *variable*. Continuous reinforcement—where each lever press is rewarded with food—is a subset of fixed ratio schedules. These involve providing reinforcement after a fixed number of responses, for example, dispensing a food pellet after every 30 lever presses. The rat figures out the number of lever presses very quickly and then a distinct pattern forms: he will rapidly push the lever 30 times and then explore the chamber for a while after he has eaten the pellet, then return and rapidly push the lever 30 more times to receive another reward. And, generally, the higher the number of lever presses, the longer the *post-reinforcement pause*. An example of this schedule of reinforcement would be someone who had to work on commission since they receive pay (the reinforcement) only after they have successfully sold some merchandise (the behavior).

There is also a variable ratio schedule where the ratio might be a random number between 1 and 20. Since the ratio could be 1 after any of the reinforced lever presses, there is no longer a post-reinforcement pause and the response rate is steadily rapid. Most amateur golfers have a drive that is contingent on a variable ratio schedule in that the delight from seeing a straight, long drive comes randomly.

Interval schedules are frequently seen by college students since exams are on fixed days, but some teachers also use pop quizzes which come at unpredictable intervals. When the interval is fixed for the rat—say after every 30 seconds the first lever press is rewarded—he shows a “scalloped” pattern of responses. This means that after each reinforcement there is a pause, followed by a gradually increasing rate of lever pressing until there is a rapid burst at the end of the 30 second interval. This has a very common analogue in humans: cram studying. When the interval is varied, however, the response rate will be steady without a post-reinforcement pause, because, if there is the chance of a pop quiz on any day you go to class, then you would need to be prepared before every class in order to do well.

The reason that these schedules aren't always obeyed—for instance, students sometimes don't study even when pop quizzes are imminent—is because the reward is often trifling or unimportant to the subject: getting a good grade isn't rewarding to a student who plans on dropping out of school. But if the reward is something desired (for example, something that satisfies one of the basic physical needs), then the responses listed above will in almost all cases follow the utilized schedule.

These are all schedules of contingent reinforcement—and there are also more than just these four—where the reinforcement depends on the response, but something strange happens when the schedule becomes non-contingent. The two types of non-contingent schedules are *fixed time* and *variable time*. During a 60-second fixed time schedule, the rat would receive a food pellet every sixty seconds regardless of his behavior and on a

60-second variable time schedule the rat would receive a food pellet anytime between 1 second and 2 minutes. It seems like the rat would just sit around waiting by the food dish since his behavior had no effect upon the reinforcement, but experiments show the opposite.

B.F. Skinner (1948) investigated non-contingent reinforcement with pigeons on a 15-second fixed time schedule. Six out of the eight pigeons involved in the experiment displayed some form of ritualistic behavior: two of them swayed like metronomes, one began thrusting her head into the corner of the chamber, one began spinning in circles, the fifth elicited a tossing response as if tossing something in the air with her beak, and the last made brushing movements directed toward the floor. And since none of these behaviors had been observed in any of the pigeons prior to conditioning, Skinner concluded that these behaviors had been accidentally reinforced by having food come out coincidentally after the pigeons' actions. Skinner also extended the experiment after finding these results, to see the consequences of increasing the time interval, so with one of the swaying birds, he increased the time interval from 15 seconds to 1 minute. And as the time interval increased, the swaying became more energetic with a very sharp toss to one side followed by a slower return.

Another curious consequence involved *extinguishing* the response, where the *reinforcement is completely removed in order to eliminate the conditioned response*. Extinction normally follows the pattern of a burst of responses followed by a decline until there are no further responses. However, in Skinner's experiment, one of the birds continued to respond after there were no more food pellets being provided, producing over 10,000 responses before the behavior was finally extinguished. This is known as *extinction resistance* and is frequent in schedules where reinforcement is intermittent. For example, in fixed ratio schedules, a schedule where reinforcement occurs after 100 bar presses will take longer to extinguish than one where reinforcement is provided after each bar press; and variable ratios provide even more resistance than fixed ones. This makes sense since if the reinforcement is coming less frequently, it will take the subject longer to discover that reinforcement is no longer being provided.

This type of experiment has also been performed with human subjects. Koichi Ono (1987) performed an experiment where students were asked to enter a booth that contained a counter and three levers. They were given the instructions that they were supposed to get as many points as possible on the counter and that "if you do something, you may get points." However, the points were actually awarded on fixed time and variable time schedules of both 30- and 60-seconds. Seventy percent of the students showed at least temporary patterns of superstitious behavior and only one third discovered they could stop all behavior and still receive points. This shows that ritualistic behaviors don't develop in people who realize they are on a non-contingent schedule (in other words, knowledge prevents rituals from being created).

Nevertheless, in all the students where ritualistic behavior formed, that behavior persisted through the entire experiment. One student continually performed a pattern of holding the lever after a burst of short pulls on it. Another began with pulling on the lever until she coincidentally received a point after simply touching the counter. Then she climbed onto the table and put her right hand on the counter, which was coincidentally rewarded with a point, so she began to touch many things in the room

while climbing on the table. A while later she jumped off the table and was rewarded with a point, which then started a ritual of jumping.

In another experiment by Stanley Aeschleman (2003), students were given response keys which they were supposed to use to keep the word GOOD on a computer screen; while another group had a similar task in which they were supposed to keep the word BAD off the computer screen. The first task is an example of *positive reinforcement* (being rewarded something desirable for performing a behavior) and the second task is an example of *negative reinforcement* (the removal of something aversive for performing a behavior—for example, avoiding heavy traffic on the way to work by leaving home early will increase the likelihood that you will leave home early). This experiment indicated that students who were given a schedule in which the word BAD disappeared from the computer screen only after long intervals of time still reported that they felt they had a great deal of control over it. And in fact, all of the students involved in keeping the word BAD off their screen reported feeling they had greater control than any of the students involved in keeping GOOD on their screen. This seems to suggest that conditions that involve the removal of something aversive are more likely to develop a ritualistic behavior.

This type of situation is common in professional athletes who are constantly under the threat of losing playing time to another player. Because, when they perform well, they do not receive positive reinforcement (since their pay is usually on a salary basis), they receive negative reinforcement (since their good performance removes the threat of losing their position). And since good performance in most athletic events comes on a non-contingent schedule (because there are too many factors involved besides the athlete's skill), the last experiment suggests that professional sports provide a fertile ground for ritualistic behavior. And that is exactly what is seen. Athletes latch onto “lucky” articles of clothing, which they wore preceding a fine performance, and will even refrain from washing them. But baseball pitchers display perhaps the strongest tendency toward ritualistic behavior because they have the hardest job to keep. Anyone who has watched a professional game of baseball has seen the pitcher display some kind of ritualistic behavior. Most rituals involve straightening the hat or touching letters on the jersey and they perform the rituals before each pitch no matter if the last pitch they performed the ritual for had a good or bad outcome.

One other factor involved in ritualistic behavior is that the brain is a bad statistician. We sometimes get “feelings” or “hunches” that tell us something about a certain situation. The most notable example of this is the “hunch” police detectives often get about suspects or cases they are investigating. And sometimes these feelings and hunches lead us in the right direction. We like to think that these feelings arise from our brain detecting and/or calculating something that is not available to our conscious awareness (which these hunches are most likely attributable to), but this unconscious detecting can oftentimes lead us in the wrong direction.

For example, there is the alleged “hot streak” in basketball, which is a hypothesis that is widely accepted as true. Basically the hypothesis is that if a player makes a shot, then he or she is more likely to make the next one taken. Coaches even instruct their players to pass the ball to players who are on a “hot streak.”

However, statistical data shows that players are just as likely to sink a shot if they have missed the previous shot (which shows that the hot streak hypothesis is false). In a study performed by Thomas Gilovich, Robert Vallone, and Amos Tversky (1985), the researchers analyzed the shot data from the National Basketball Association. They found that for non-foul shots, players made 51% after sinking the previous shot and 54% after missing the previous shot and 75% for foul shots either way. This study was published in 1985 and coaches, players, and fans still think the hot streak hypothesis is true. This is most likely because it is easier to notice when a player hits several shots in a row than to notice the number of times the player scores when the made shots and missed shots are intermixed.

A similar illusory correlation is the hypothesis that it always rains after a person gets a car wash. The reason this seems to be true is that the number of times it *does* rain after we get a car wash stands out in our memory due to the way memories are stored. When it rains after we get a car wash, we continue to think about that fact (usually bitterly) since it annoys us and we sometimes try to recall all the times it has happened before. Whereas when it does not rain, we drive home, put the car in the garage, and stop thinking about it. And it is well known that the more times something is rehearsed, the more likely we are to remember it, so we evidently have a better chance of remembering when it rains after a carwash.

The reason the brain is a bad statistician is because it is a cognitive miser. Detailed processing and memorization of data takes more thought, which costs more energy and associates more neurons; and the energy our brain has is limited by how quickly our blood can transport it there, and the number of neurons in our brains is also a limited quantity. So our brains make many shortcuts for situations that do not require careful deliberation in order to not exhaust all of its resources.

This inability to process statistics could play a role in the development of ritualistic behavior because the brain doesn't keep track of how many times a behavior was not reinforced in between the times it was coincidentally reinforced on a non-contingent reinforcement schedule. Accordingly, if the schedule continues, there will be no chance for the ritualistic behavior to be extinguished. However, we saw in Ono's experiment that if the participants realize the reinforcement is on a non-contingent schedule, then no ritualistic behavior will occur, so non-contingent reinforcement only produces ritualistic behavior in subjects who are unaware of the type of reinforcement schedule being implemented.

Now we will summon up our Man on an Island to see what effect non-contingent reinforcement would have on him. Let's imagine he is a farmer, which means he relies on the weather to ensure that his crops grow, but since he is completely naïve, he doesn't understand agriculture (and therefore doesn't know that the rewards are on a non-contingent schedule). The reward of good weather—a bumper crop—most definitely follows a non-contingent schedule, because he has no way to actually influence the weather. And the previous experiments tell us that non-contingent reinforcement produces ritualistic behavior, so there is a high probability that the Man on an Island will develop some kind of ritual for a bumper crop. In fact, based on Ono's experiment we could say that the probability is around 70 percent, which means that if there were two Men on Islands, at least one of them would develop a ritual.

But at this point, the ritual is for the bumper crop, not good weather, because the bumper crop is the reward and he doesn't necessarily notice that the weather is what brings the bumper crop (we will investigate what happens when he notices the relationship of the weather on his crops in the next chapter); and we saw in the experiments that ritualistic behavior is produced after it is coincidentally reinforced, which means that when the bumper crop comes, he will repeat whatever behavior was coincidentally reinforced by its arrival.

The experiments in this chapter demonstrate that non-contingent reinforcement schedules can produce ritualistic behavior. And we have also seen that in humans who do not understand agriculture (like our Man on an Island), ritualistic behavior will develop since the rewards of agriculture are on a non-contingent schedule. This isn't to say, though, that rituals are only developed as a consequence of non-contingent reinforcement schedules. Rituals could develop in other ways, but the next chapter will show why rituals formed from non-contingent schedules play a singular role in the invention of religions as we see the effect that obedience has on rituals and behavior in general.

## Chapter Three

### Deities

*A being who is worshipped  
and has authority over certain aspects of life.*

Our definition of a deity is a being who is worshipped and has control over certain aspects of life. So in this chapter, we will investigate the Milgram experiment, which is the most famous study on obedience to authority figures. Then, in the second half of the chapter, we will study another famous experiment on anthropomorphism performed by Heider and Simmel.

Milgram (1974) devised his experiment to measure the willingness of subjects to carry out orders that went against their moral conscience when those orders came from a perceived authority.

Participants were recruited thinking it was a memory experiment and were told they were to be the *teacher* and would be administering electric shocks to the *learner* whenever the learner answered incorrectly. However, the role of teacher seemed to be assigned randomly to the participant, because both the learner and the teacher chose slips of paper listing their role, but the slips of paper actually both said teacher and the learner (who was a confederate of the experimenter) just always claimed theirs said *learner*. Before the experiment began, the teacher was given a 45-volt sample of the electric shock that would be received by the learner for each wrong answer and they reported finding it quite unpleasant. Then the teacher read a long list of an arbitrary pairing of words to the learner and the “learning” began.

The learner was supposed to memorize the word-pairs and then when the teacher read one of the words, the learner was supposed to pick the associated word from a choice of four. And the teacher had been instructed before the experiment began that he was supposed to administer an electric shock each time the learner answered incorrectly and that he had to increase the voltage with each shock.

The teacher had an apparatus that had switches for administering shocks ranging from 15 to 450 volts at 15 volt increments, which means that the teacher would shock the learner 30 times before reaching the maximum; and the experimenter would allow the teacher to repeat the maximum voltage three times before ending the experiment. The

apparatus also had labels over the voltage increments, that were meant to heighten the frightening appearance of it, proceeding from *slight, moderate, strong, very strong, intense, extreme intense shock*, to *Danger: Severe Shock*. And the labels ended with a plain but terrible *XXX*.

Apart from the demonstration shock the teacher had received, though, the shocks were all fake, but there was a tape recording that would play the learner's "response" to each of the shocks (so that the response would be consistent through all experiments). These started out as startled yelps that grew to angry shouts around 150 volts (10 shocks in). Then by 270 volts (18 shocks), the learner began banging on the wall and screaming until finally, at 345 volts (23 shocks), there was no further response from the shocks (as if the learner were unconscious or dead).

Milgram explained the entire setup to colleagues and undergraduate psychology seniors and asked them to predict how many people would actually be willing to inflict 450 volts. The prediction was that only about 1% of the participants would proceed to the maximum voltage, so they were very surprised when 61-66% of the participants went all the way to the maximum every time Milgram performed the experiment.

This isn't to say that none of the teachers had misgivings about administering the shocks. Some began to question the experimenter when the learner began to angrily shout, but all of the participants continued to at least 300 volts. They received several assurances along the way; if they questioned the experimenter, they would receive predefined verbal prods ("Please continue", "The experiment requires that you go on", "It is absolutely essential that you continue", "You have no other choice, you must go on"), and if the subject asked who was responsible if anything happened to the learner, the experimenter would respond, "I am responsible."

But the fact remains that they had met the other person and thought (because they had drawn roles from strips of paper) that they could have been the one receiving the electric shocks if the odds had flipped the other way; and they had been paid ahead of time and told that the payment was for showing up and they could keep it "no matter what happens."

The experiment was repeated many times and the percentage never varied, but one other result they found was that in all the participants who left early, none of them went to check on the learner without first asking the experimenter. So, even though they had rebelled from the experiment, they still felt that the experimenter was an authority they had to obey in other respects.

What this experiment shows us, though, is that the presence of an authority figure produces obedient behavior in people.

So it makes sense to wonder what constitutes an authority. Milgram altered his experiment in various ways to measure the effect on obedience levels and one of the variations was to move the experiment to an office on a backstreet that had no sign on the door. And the same experiment produced the same results, so the authority that the participants felt had nothing to do with the prestige of Yale University (where Milgram worked and the first experiments were held). There was a difference, however, when the proximity of the experimenter was decreased. When the commands of the experimenter came from a telephone or a pre-recorded tape, only 23% of participants went to the maximum voltage (and some cheated by pretending to give shocks or giving shocks of lower voltage). And in a third variation, where there were two experimenters that were

arguing, with one telling the participant to stop and the other saying the participant should continue, then no one proceeded to the maximum.

From these two variations we can see that an authority is someone whom the subject perceives as possessing some kind of control over their behavior, because when the participants had the chance to cheat (which means the experimenter had less control over their behavior), they were less likely to inflict the maximum voltage; and because when there were two orders and the participant had to decide for themselves (which means that neither experimenter had any control over their behavior), no one inflicted the maximum voltage.

And if we look back at Learning Theory, we see that the only way to control behavior is through reinforcement and punishment. So an authority is anything that has the power to distribute reinforcement and punishment.

Authority figures don't always order subjects to carry out such extreme actions as the ones required in Milgram's experiment. For example, parents are (usually) authority figures for their children and some of their orders are as mild as telling their children to say *please* and *thank you*. But the point of investigating Milgram's experiment was to demonstrate that a perceived authority produces obedience in humans, although it is not clear whether obedience is innate or a conditioned response.

Now it's time again to see the effects these psychological phenomena have on our Man on an Island. Using the example of farming again, we can see that if he notices that the weather seems to determine how his crops will grow, the weather will become an authority figure for our Man on an Island, because it has the power to distribute reinforcement (by bringing rain and sun which grows more crops) and punishment (by desiccating the crops with too much sun or drowning them with too much rain, etc). And the behavior that the weather will most likely control (which is the obedience he shows) is his ritual since he is already performing it to make the crops grow (although a new ritual could also be formed). So the Man on an Island becomes obedient to the weather, performing his ritual as if the rewards and punishment of the weather depended on whether or not his ritual was performed. And this is different than when the ritual was originally created, because now he is performing the ritual *to* something (the storm in this case), whereas before he was performing the ritual in order to make something happen (the crops grow). The point to grasp here is that he has to notice that the weather determines how his crops will grow (and hence has authority over the process) in order for him to change his ritual into worship (which we will define as *a ritual performed to a particular thing*); or in other words, not every ritual that is formed will lead to the invention of a deity.

Once our Man on an Island has invented one deity with his ritual, he will most likely try out his ritual in other situations. And if the ritual works, he will assign another authority to his deity. So, since non-contingent reinforcement is coincidental, there is a possibility that his ritual will continue to produce rewards when he tries it in other situations, which means there is a chance that our Man on an Island will think that one deity has authority over everything. And even if he has already established other rituals, if he sees that one ritual works in those situations it will most likely "override" those other rituals. This means that a monotheistic religion can form from the outset, although

we will see in Chapter Six that there are other ways a monotheistic religion can be invented.

However, it is more likely that one ritual will only work in a limited number of situations, because the efficacy of each ritual is coincidental. In this case, the Man on an Island will form many deities that have at least one authority, because he will find that different rituals “work” in different situations.

Deities might also be formed that have authority over other things besides the inventor. For example, if someone noticed that the trees are provided for they might form the concept that there is an authority figure for the trees which gives them sustenance and punishes intruders.

But, in all these cases, the deity will be formless when it is first invented. And we can see an example of worshipping and obeying formless entities in the ancient Celtic religion. Before their religion began to be influenced by the Greeks and Romans, the Celts worshipped forces of nature that were not anthropomorphized like the Greeks, Romans, and Egyptians were. But as time passed, their religion changed to one in which the deities had human forms (Wood 2000).

So we can summarize this concept by saying that our Man on an Island will create deities that have authority over aspects of his life in which reinforcement and punishment come on non-contingent schedules like farming, childbirth, hunting, war, death, etc if he notices that *something* is providing the reinforcement and punishment.

Although this phenomenon produces belief in deities and obedience to them, it doesn't produce absolute obedience. We saw in the Milgram experiment that the more remote the authority figure became the less obedient people acted. So the degree of how remote their deity seems to them, will determine how obedient or respectful they are to that deity.

It makes sense now to investigate what it takes for the Man on an Island to anthropomorphize the weather, since many religions have anthropomorphic deities. (But deities also do not need to be anthropomorphized at all in order for them to be worshipped, as we just saw.)

An interesting study that investigates anthropomorphism was performed by Heider and Simmel (1944) in which participants were shown a stop-motion film that involved two triangles, a disc, and an empty rectangle with part of one side that hinged open. The participants were divided into three groups: one that was instructed to describe what happened in the film; one that had to answer a questionnaire; and one that watched the film backward and had to answer some of the questions from the questionnaire.

In the film, the geometrical objects move around and go inside the rectangle, and the hinged side of the rectangle opens and closes several times during the film, so it's understandable that the participants in group one came up with a story for the film. They described the geometrical objects as having plans, desires, emotions, pain, and basically described the two triangles as men who were fighting over the disc (whom they described as a woman). The rectangle was described as a house and the side which hinged open was always described as a door that was opened by the triangles and disc, not one that pushed them. All but three participants saw the geometrical shapes as humans. Two saw them as birds (perhaps because the triangles looked like beaks) and one participant attempted to describe them as geometrical objects, but slipped up in the last sentence and

called one of the triangles *he* (which means that participant probably saw them as humans but wanted to remain objective).

On the questionnaire that the second group filled out, one of the questions asked the participants to describe the big triangle's personality and 97% of the participants described him as an aggressive, dominating, and possessive villain. And the disc was described as a timid woman who hid inside the house during the fight by 94%.

For the group that watched the film in reverse time there was no consensus on a story (and this makes sense, because a series of events that form a story don't form another story when played in reverse); however, the participants all saw the objects as performing human actions. But the fact remains that even when the film wasn't intentionally given actions resembling a plot, people still anthropomorphized the objects and invented stories to go along with the actions. What this shows us is that people find characteristics in the movements that make the inanimate objects seem human to us and seem to be acting out a story. And we do this even with movements that have no design or purpose integrated into them.

An example of finding characteristics in movements can be seen during the fight, when the movement of the little triangle seems caused by the large triangle, as if there was actually hitting occurring, but this movement could just as easily be interpreted as the little triangle happening to move away at that moment. But the fact that everyone sees the action as hitting shows that our brain causes us to animate the scene and anthropomorphize the actors.

This isn't such a strange finding, though, because humans frequently personify inanimate objects. We describe the sun as *peeking* out from behind clouds, *hiding* all day, or *smiling* warmly down on us. And these are all action verbs that we have applied to an object that is doing nothing we can see (apart from seeming to move across the sky). One thing we should grasp from the experiment, though, is that—because this all happened after the participants watched only one film involving the triangles and the disc—it is evident that it only takes one instance of an inanimate object performing movements characteristic of a human for someone to anthropomorphize that object and invent stories to explain its movements.

However, Heberlein and Adolphs (2004) showed Heider's film to a patient who had damage to her amygdala on both sides of her brain and found that she described the events with inanimate terms. The patient did not even assign genders to any of the objects nor did she use descriptions that implied interactions among the objects. So her brain damage, which is associated with a structure that plays a crucial role in social cognition, seemed to make her blind to the animation that people without brain damage generally see. This seems to suggest that the amygdala plays a role in anthropomorphizing objects, which means that anthropomorphizing is a neural function which is innate in all normal humans.

Returning to our Man on an Island, then, we can examine what influence this phenomenon would have on the inanimate objects around him. We have dealt with the example of the weather already, so we might as well flesh it out some more.

We have seen already that our Man on an Island has become obedient to the weather, performing his ritual as if the growth of his crops depended on whether or not

his ritual was performed. And he sees it as an authority figure that has the power to distribute or withhold reinforcement and punishment.

So when fierce storms come, the Man on an Island might see the weather as becoming angry and since the storms seem to come often and with no warning he might see the weather as an irascible being because it becomes angry so easily. And the Man on an Island also might think that he is the cause of the weather's anger, thinking that he has done something wrong (like not performing his ritual enough or performing it without enough enthusiasm). But most of all, he will see the weather as a powerful being (and therefore most likely male), because it has the strength to rip trees out of the ground and start fires and landslides.

If we compare this new belief of the Man on an Island to those of real cultures, we see that it is not at all far fetched. Mythological deities that are associated with lightning, thunder, rain, and wind are often portrayed as powerful but irascible males who hurl lightning bolts when angered. For example, Zeus (Greek), Thor (Norse), Indra (Vedic), Perun (Slavic), and Set (Egyptian) were all weather deities that were described as having irascible personalities. And apart from Set they were all also the ruler of their pantheon because they were the most powerful.

And the more that the Man on an Island sees movements that are characteristic of humans in the deities he has established, the more anthropomorphic traits he will assign to those deities.

So we have now established how the associated psychological phenomena can produce all the aspects of our definition of a deity in someone like our Man on an Island. And we will see in Chapter Six how the concept of deities evolves even further to get dressings like names, symbols, etc.

## One Further Note

The concept known as *agent detection* could also play a role in the invention of deities. This is the inclination for animals to assume that a sentient agent caused something to happen when there is no certainty that any agent is involved. For example, when we hear an unexpected noise while we are walking through the woods, our first conclusion is that some other animal stepped on a twig, not that the wind snapped a branch in a tree. But we can even detect agents and not have a specific representation of the agent in our mind (which leaves room for thinking other *things* exist).

It has been conjectured that agent detection evolved due to the survival value it provides (Gray & Wegner 2010). Because, if we take precautions every time we hear an unexpected noise or see an indentation in the ground that could be a predator's footprint, then our chances to survive an attack the one time there *is* a predator nearby are greater than if we had ignored the signals.

The concept of agent detection, though, seems to provide evidence of deities so it would most likely strengthen a person's belief in them but not necessarily invent them in that person's mind (since you need to know what you're looking for in order to find evidence of its existence).

## On Prayer

In the last two chapters, we have seen the psychological phenomena that produce rituals and deities and prayer is essentially a ritual performed for a deity. So in this section, we will investigate whether there is any evidence that the prayer of today's religions is any more effective than the ritualistic behaviors that develop in the manner we have been investigating.

Duke University (Krucoff et al. 2005) performed a three-year clinical trial studying the effects of intercessory prayer and Music, Imagery, and Touch (MIT) therapy on coronary patients. The study spanned 9 hospitals and 748 patients in the United States and 12 different prayer groups were used. The prayer groups included Buddhists, Catholics, Jews, Moravians, Muslims, Fundamentalist Christians, Baptists and prayers were even sent to Jerusalem to be placed on the Wailing Wall. MIT therapy involved the patients listening to 40 minutes of peaceful music while imagining the most beautiful place they have ever been before their procedure. Then 21 "healing touch hand positions" were applied for about 45 seconds for each position. The patient also had the choice to listen to the peaceful music they picked during the coronary procedure.

In the study, the patients were divided into 4 groups: one group that received prayer and MIT therapy, one that received prayer only, one that received MIT only, and one that received neither. Thus, the only groups that were double blinded were the groups that received prayer only or neither treatment, so the other two groups might display signs of the placebo effect because the patients undergoing MIT therapy obviously knew they were getting extra treatment.

The experiment studied the primary clinical outcome to see if prayer had an effect on the number of major adverse events such as death, the need for stenting, or the need for bypass surgery, etc. And it also compared the outcomes between groups 6 months after the procedure.

The primary clinical outcome did not even show a placebo effect and all groups had nearly the same number of major adverse events. However, the lead author of the study excitedly reported early findings from the study since the early results showed a 100% reduction in major complications and 50% reduction in all complications for the prayer therapy group (Krucoff et al. 2001). But since the final results showed the opposite effect, the early results were most likely a consequence of having a low sample size since less than one fifth of the patients had been tested at that point.

The six month outcome of the final study, however, did show a slight difference that could be attributed to the placebo effect: in the two groups that received MIT therapy, there was a difference ( $P = 0.016$ ) in the number of deaths. But the reason that this result is most likely due to the placebo effect is because there was no significant difference between the MIT group that received prayer and the group that did not.

This study shows that the effect of prayer on coronary patients is no different from the control groups, but the patients also didn't know whether they were being

prayed for. The next study we will investigate experiments with the certainty and uncertainty of receiving intercessory prayer in patients undergoing surgery.

This study involved 1,802 patients undergoing coronary artery bypass graft (CABG) surgery and was performed by six medical centers including the Mayo Clinic and Harvard (Benson et al 2006). There were three groups in this study each with about 600 participants. One group received prayers but was uncertain whether they would receive prayers or not. Another group did not receive prayers but was also uncertain whether they would receive prayers or not. And the final group received prayers and were told they were being prayed for. These prayers started the night before surgery and continued for 14 days. The study then measured the number of patients who had any complication within the first 30 days after CABG surgery and compared the results between the 3 groups.

In the two groups uncertain about whether they were receiving prayer, complications occurred in 52% (315/604) of patients that did receive prayer and 51% (304/597) of patients that did not receive any prayer. In the third group, in which the patients knew they were receiving intercessory prayer, 59% (352/601) of the patients had complications. And the mortality rate was the same across the three groups over the 30-day period.

So we can see from this study that prayer in itself did not effect the occurrence of complications due to CABG surgery; however, in patients that knew they were being prayed for there was a slightly increased amount of complications. This latter result is technically a *nocebo reaction* (as opposed to a placebo reaction since the complications were increased) and the researchers attributed it to the patients having increased anxiety because they were perhaps under the impression that their condition was so grave that they *needed* some kind of supernatural intervention.

And on a side note, both of these studies were performed by scientists who were also religious and whose goal was to find a connection between science and religion, not to disprove the efficacy of prayer. So the experimenters obviously did not deliberately produce the results of the studies.

But we can see from these studies that there is no evidence that the prayer of today's religions is any more effective than the ritualistic behaviors that develop in the manner we have been investigating.

## Chapter Four

### The Soul

*The animating essence of a person  
that distinguishes them from others.*

In this chapter we will investigate the concept known as *theory of mind* and see how it applies to the formation of the concept of a soul. To have a theory of mind means that you comprehend that other beings have thoughts, desires, intentions, etc. that differ from your own. This presumption is the reason it is called *theory of mind*, because the mental state of another being is not directly observable and your own mind is accessible only through introspection.

Every normal healthy human being has a theory of mind; a theory of mind deficit is only found in disorders: people with autism and schizophrenia, people who are sleep deprived, and people under the influence of alcohol or narcotics can all show a theory of mind deficit (Baron-Cohen et al 1999). However, the effectiveness of each person's theory of mind is not equal because to develop a theory of mind requires experience (this will be shown in the experiments to follow).

The first experiment was developed by Astington & Gopnik (1988) and involved testing the theory of mind in young children. During the experiment, an adult shows a 3-year-old a box of candy and asks the child to tell him what is inside the box. After the child tells him there is candy in the box, the adult opens it to reveal pencils. The box is then closed and the adult asks the child what she thought was in the box when she first saw it (before the box was opened). Until the age of 4 or 5, almost all children will answer *pencils*. And again, when the adult asks the child what someone else who has not seen inside the box will think is in it, almost all children under the age of 4 or 5 will answer *pencils*. This task shows that young children have trouble understanding that a belief can be false, so they cannot attribute a belief that is different from the one they currently hold to other people or to themselves at other times. They answer as though people would somehow intuitively know the contents of the box and as if appearances

could not fool people. However, almost all children who are at least 5 years old are able to grasp that *candy* is the correct answer to both questions.

Another predictor for succeeding on the task is language proficiency; in particular, there is a correlation between succeeding on the task and the ability to use words like *think* and *know* (Moore et al 1990). Having a sibling also correlated with an increased likelihood to succeed on the task, even for children who were not as verbally proficient (Jenkins & Astington 1996).

The results of Astington & Gopnik's experiment, though, suggested that age plays a role in the development of theory of mind, but that experiment included only North American children. Vinden (1996) performed a culturally equivalent version of Astington & Gopnik's experiment in a Peruvian village. Her experiment found that even 8-year-olds would fail the task in this village. The conclusion Vinden drew from these results was that the Peruvians "live mostly on the landscape of action" because they are "subsistence farmers, working from dawn to dusk just to survive" (1996).

This shows that it is not actually age, but experience that plays a key role in the development of theory of mind. We can see this in the Peruvian village from Vinden's study since the children hadn't had the same experiences as North American children because their culture and language doesn't ever portray someone having a false belief nor do they describe "how people's thoughts might affect their actions" (1996).

So we can see that developing a theory of mind is dependent on experience and since people are not given the same experiences it would be sensible to suppose that some people would have a more effective theory of mind than others.

An ability that employs theory of mind is lying, because to determine if a lie will be believable, you need to know how someone else will react to your fabrication. Children learn very quickly that lying can cover up their misdeeds, which saves them from punishment (Newton et al 2000), and Sears, Rau, & Alpert (1965) devised an experiment to demonstrate this tendency in what they termed the temptation resistance paradigm.

In the experiment, children are brought to a room with a concealed toy and told not to peek at it or play with it while the experimenter is gone. The experiment is named appropriately, because children have much difficulty resisting the temptation to peek at the toy and almost all of them disobey the experimenter's instructions. Then, when the experimenter returns, she asks the child whether he has played with the toy or even just peeked at it. The child therefore has the chance to lie and cover up his misdeed, which is the advantage of this experiment, because it studies lying in children without having to instruct them to lie and also mimics the usual circumstances that children tend to lie in.

Using the temptation resistance paradigm with 3-year-old children, Lewis et al (1989) found that around 90% of the children peeked at the toy and about 38% lied about peeking. Talwar and Lee (2002) found the same results when they replicated the experiment, but also found that when the children were 4 to 7 years old, the majority of them lied about peeking. And it's not just that the children forgot they had touched it, because when Polak & Harris (1999) added a permissive condition to the paradigm with 3- to 5-year-olds, every single child in the permissive group admitted to touching the toy, whereas the majority in the prohibitory group—who were instructed not to touch the toy—lied about touching it, just like in Talwar and Lee's experiment. These results show

that children are able to deliberately deceive others and that this ability arises around the same time that the theory of mind ability does.

On a side note, most people with autism are unable to lie, because they do not have the ability to comprehend that there can be a point of view that differs from their own. This isn't due to any kind of lack of intelligence (people with Downs Syndrome are able to lie and pass theory of mind tasks (Baron-Cohen 1985)) it is simply due to the fact that they are unable to pass theory of mind tasks (Pelphrey et al 2005).

Still, children don't begin to lie convincingly until they are between six or seven years old. The deficit in their ability lies in *semantic leakage control*, which is the inability to maintain consistency between the initial lie and subsequent statements. This was demonstrated by Talwar and Lee (2002) when they asked the children what the identity of the toy was after the child had claimed he or she had not peeked. The children between ages 3 and 5 usually revealed the toy's identity without realizing that their knowledge implicated them. On the other hand, nearly half of the children between 6 and 7 years old pretended they were unaware of the identity of the toy and the adults were actually unable to tell these children's answers apart from the answers of the children who did not peek.

It can be seen from these results that with experience, children develop the theory of mind abilities that make lying successful. However, lying was merely meant to be an example of a theory of mind ability and this isn't to say that theory of mind is the only factor that plays a role in the ability to lie effectively.

If we want to look at how theory of mind would affect our Man on an Island, we have to introduce the Other Man. We will make the Other Man identical in definition to the Man on an Island, but they will both differ as much as any two normal human beings do.

Now, we have seen that theory of mind develops through experience in every normal human being, so we know that both of our Men will develop a theory of mind after some period of time. This means that our Man on an Island will be able to notice that the Other Man has thoughts, desires, intentions, etc. that differ from his own. So he will eventually begin to think, "Something different in him makes him think and act differently than I do. And it's the essence of what makes him different from me (apart from physical appearance)." He will also of course conclude that this essence is also in himself, because it is what makes him different from the Other Man.

Theory of mind might also be an explanation for why many religions don't regard other animals as having a soul. Because we have to have a sufficient amount of contact with an animal in order to see that they exhibit signs of having a theory of mind. Most of what we see might be anthropomorphized attributes, but being around other animals for long enough can make a person think they have theory of mind. For example, most pet owners would be familiar with a pet watching the outside world through the window (which they might see as thinking), begging for food (which shows desire), or hiding and getting ready to pounce (which shows intent), etc.

(On a side note: current research has still not come to a conclusion about whether or not other animals have a theory of mind, although the hang up is mostly on deciding what constitutes proof in an animal that cannot speak.)

But we can see that there is a chance that some groups of early man would have been around other animals enough to either anthropomorphize them in the manner we investigated in the last chapter or to detect a theory of mind in them. So there should be some religions that hold the belief that animals have souls and some that do not.

And there is some overlap even among religions: Christianity holds the belief that other animals do not have souls, (although some Christians believe that at least some of them do), but Hinduism holds the belief that a person can be reincarnated as a non-human animal, so they obviously hold the belief that other animals have souls.

In our definition of the soul, the second half involves animation, so it makes sense to take a look at the differences that manifest when the body is no longer animated.

The body goes through several stages after someone has died (Mayer 2005 & Saferstein 2004). The stages that are noticeable to a human within a few hours and with no measuring equipment apart from their senses are *algor mortis*, *pallor mortis*, *livor mortis*, and *rigor mortis*.

*Algor mortis* is the cooling of body temperature after death. The rate is actually exponential, but it can be approximated by subtracting 2 degrees Celsius for the first hour after death and then 1 degree for every hour after that until the temperature nears that of the surrounding environment. And a 2 – 4 degree loss in body temperature can easily be detected by touch (Kultz-Buschbeck et al 2010).

The next quickest stage is *pallor mortis* which occurs anywhere between 15 minutes to 2 hours after death. This is where the body becomes pale due to the lack of blood circulation in the body since the heart is no longer pumping. And since there is no circulation, the blood will also sink to the lowest part of the body due to gravity creating the purple skin discoloration of postmortem lividity (*livor mortis* stage).

Then, after about 3 hours, the body becomes stiff in the *rigor mortis* stage. This occurs due to a lack of respiration which means that the muscles are no longer receiving oxygen. This lack of oxygen causes chemical changes in the muscles which makes them stay constantly contracted until the muscle tissues breakdown during decomposition.

Of course, there is a drastic change to the body during decomposition and skeletonization, but the promptly noticeable characteristics are that the body becomes cold, stiff, and pale after death. And since the brain is no longer functioning after death, a dead person also cannot talk, move, or respond in any way.

What this means for our Man on an Island is that, if the Other Man were to die, he would notice that at one point the Other Man could talk and move around and respond to him, but then the Other Man suddenly became immobile and silent. And the color drains out of the Man and his body turns rigid like the stones and trees around them. So it becomes evident that whatever had animated the Other Man had suddenly stopped functioning. And since the Other Man can no longer talk or respond, he can't exhibit his theory of mind, so the Man on an Island can no longer detect the essence of the Other Man.

With a little introspection, then, the Man on an Island will realize that his own thoughts, desires, intentions, etc are what control and animate his body, because if he thinks about moving, he moves, etc. So he will ultimately conclude that the essence that

he can intuit in other Men and in himself animates the body and something happens to this animating essence at death.

We will explore what beliefs the Man on an Island will create about what happens at death in the next chapter.

# On Consciousness and Free Will

## Consciousness

What you can feel is determined by whether there are nerves extending to that region of the body. For instance, you can't feel when someone cuts your hair, you can only feel the roots of the hair tugging at your scalp. And in some areas only certain feelings can be felt: if someone had a length of your intestines in his hand, he could cut it and stab it and you wouldn't feel any pain, but the moment he stretched it longitudinally, you'd cringe and double up in agony.

And what you are aware of in your body is determined by your brain. You don't notice that your lungs, heart, kidneys, liver, etc are all functioning; you wouldn't even know you had any of them unless you were told or cut someone open. But the brain controls their functioning and monitors them to ensure that nothing goes wrong like how when a foreign object enters the pathway to the lungs, a coughing reflex immediately begins. And we could be in control of more functions, for example, dolphins and whales are conscious breathers, if they are knocked unconscious they will not breathe, but humans cannot hold their breath forever, because they will eventually lose consciousness and begin breathing again. So it is evident that our consciousness hardly performs any of the functions of the body. These observations seem to suggest that consciousness is also a neural function, so it makes sense to investigate the nature of consciousness a little more.

The brain has two hemispheres and each hemisphere controls and receives input from one side (the opposite one) of the body. The two halves are usually connected by the corpus callosum, but in people who suffer from seizures, this connection is sometimes severed as a last resort in treatment.

When a person has a split brain, the two halves cannot communicate, which means that images shown on only one half of the visual field reach only one side of the brain and are thus completely "unknown" to the other side of the brain. The portion of the brain which controls speech is located in the left hemisphere in most people, which means that a person with a split brain will only be able to speak about things seen in the right visual field. This means that they will not be able to name anything shown to them in their left visual field, however, they would be able to point to the object, but only with their left hand.

Roger Sperry (1961) studied this phenomenon through experimentation. The standard experiment involves using a tachistoscope, which is a monitor with an X in the center that the patient is directed to stare at while a word flashes on one half of the monitor. The image flashes so briefly that there is not enough time for the patient to

move their eyes over to it, so they only see it in one half of the visual field. So for example, if the word *key* were flashed on the left side of the screen, only the right hemisphere of the brain would perceive the word and they would not be able to verbally tell the experimenter what they saw (because the language center is in the left side). The patient will even inform the experimenter that they saw nothing on the screen, but if asked to reach behind the screen with their left hand to identify the object (by sense of touch), the patient will identify it as accurately as a non-split brain control. However, even though they are holding the key in their hand, as long as it remains behind the screen, the patient cannot tell the experimenter what it is they're holding. This phenomenon can also be observed in the same way by having the patient write the word they saw instead of having them touch the object they saw. And they will only be able to write the word with their left hand and still will not be able to name the object as long as they can't see what they've written.

These findings challenge the fundamental characteristic of consciousness, because we feel like our subjective experience of the world is unified, but in the split brain patient there seems to be a division of the mind. An example of this is seen in a condition called *alien hand syndrome* (Scepkowski & Cronin-Golomb 2003). This is a condition where a person's limb behaves with a "will of its own" that can happen after a corpus callosotomy. For example, someone might put a cigarette in their mouth with their right hand and then before they can pick up a lighter and light the cigarette, their left hand tosses the cigarette away. In this way, the afflicted person might not be conscious of the actions performed by their alien hand until it does something that they notice, which clearly demonstrates that our consciousness can be divided.

This of course leads one to wonder if there are other divisions and we find one such division in a disorder termed hemispatial neglect. This is usually the result of a brain injury to the right parietal lobe and causes the injured person to be unaware of the left side of objects and/or their visual space. For example, if a patient (Ramachandran 1998) with hemispatial neglect was given a plate with the food all on the left side, he would not eat any of it even though he had asked for the food. But once the plate was rotated so that the food was on the right side, he would partake without delay. In some cases, the patient would be able to see every object in a room, but would neglect the left half of each object and in other cases, the patient with hemispatial neglect would ignore all objects in the room that are to the left of their midline. However, neglect can be very strange when it came to the patient's own body, because they ignore their whole left side. When they shave or put on makeup, they only do it to the right side of their face and they even deny that their left limbs are their own. If their physician holds up the patient's left arm and asks whose arm it is, the patient will say something like, "Well, you're the only other person here, so I guess it has to be yours."

And in another case (Weiskrantz 1986), a patient referred to as Gy who had a damaged left visual cortex, was unable to see anything in his right visual field. However, when a spot of light was placed in this region and Gy was asked to reach out and touch it, he could do so with near to 100 percent accuracy. But he never knew that he was touching it because he had no conscious perception of the experience; in this case, the patient wasn't conscious of seeing anything, but his brain could still orient his hand toward a target by sight.

Our perception of the world can also be altered by brain lesions. If a person has the part of the visual cortex labeled V4 damaged on both sides of the brain, they can no longer see colors, only shades of gray (Ramachandran 2011). But damage to the middle temporal area can cause a person to no longer be able to perceive motion. The world appears like still-frames of a movie so that the afflicted person can no longer judge speed, making it impossible to safely perform activities like crossing the street or pouring a glass of wine (Ramachandran 2011).

So we have seen from these case studies that our feeling of self-identification of our body can be disabled just by having an area of our brain be damaged; our consciousness of perception can disappear from brain lesions; and we have also seen that our subjective experience of the world (which is an element of consciousness) can be unified or divided. But if parts of consciousness and perception can be disabled or divided by removing or damaging areas of the brain, then they must be neural functions; which means that if a soul did exist, it would have no effect on these parts of consciousness. And that makes its existence in the human body very questionable.

## Free Will

Free will is the ability to choose your own actions. Actions in this sense can be both physical and mental actions like thoughts, but the point is that in order to exercise free will, you must be able to choose your actions without constraints.

Free will is obviously not absolute. For instance, no matter how much you will it, you cannot make yourself invisible. So free will will always be limited by our abilities. And some actions, like reflexes, are uncontrollable. For example, as was said before, a person cannot hold their breath forever, because they will eventually lose consciousness and begin breathing again.

But there is another limiting factor, which is explored in an experiment by Schacter. In Schacter's experiment (1962), he injected all the participants with epinephrine and put them in an *informed*, *uninformed*, or *misinformed* group. The informed group was told that the drug (no one was told it was epinephrine) would increase their heartbeat, and make them feel "hyper" and energetic, while the misinformed group was told they will feel itchy, and as though their feet are numb, and will get a headache (all of which epinephrine does not produce); and the uninformed group was told nothing at all. When participants volunteered for the study, they were told it was an experiment regarding vision, so after they were injected with epinephrine, they were shown into a waiting room to wait for the drug to take effect. After a little while, a confederate of the experimenter came into the room to wait, but then began behaving exhilaratingly. He started shooting wads of paper into the wastebasket as if playing basketball, sailing paper airplanes around the room, shooting a rubber band at a tower of folders, etc. Participants in the informed group understood why they were feeling an increased heartbeat and other physical effects and most of them regarded the man's behavior as inappropriate and did not participate in it. This was the same reaction to the confederate that the *control* group had, who had not been given any epinephrine and was just told to sit in the waiting room. The reaction of the misinformed and uninformed groups was quite different from the informed and controlled, though: almost all of them actually joined in with the confederate and afterward reported feeling elated during the experience.

So we can see that when the participants knew they were going to feel hyper and energetic (informed group) they were able to act as though they weren't feeling this way (like the control group). But when they were unaware of why they were feeling this way (misinformed and uninformed groups) they acted with abandon. In other words, the subjects who were informed of the effects of the drugs were able to decide whether to join in the exhilarant behavior or not; whereas the subjects who knew nothing, let their actions be determined by their physical state.

In further tests, Schacter used the same set of groups but this time used a tranquilizer for half of the participants and epinephrine for the rest. The participants then

watched a slapstick movie and again the informed group acted the same as the control group for both the tranquilizer and epinephrine. However, in the misinformed and uninformed groups, the participants who received a tranquilizer (which has the opposite effect of epinephrine) laughed less and reported less amusement at the movie than the control group, while the participants who received epinephrine laughed more and reported more amusement.

Now, epinephrine (also known as adrenaline) is naturally produced in the body when a person gets excited, scared, is under stress, etc. So this experiment shows that bodily functions can cause us to act in certain ways if we are unaware of their effects. An increase in adrenaline can be detected by feeling the heartbeat, but it is unlikely that every body function can be accounted for. For example, serotonin contributes to feelings of well being, and foods that contain more tryptophan than phenylalanine and leucine increase the amount of serotonin in the body (Young 2007), so it would be very hard for someone to tell if their diet was causing them to have higher levels of serotonin and thus feel elated.

So we can see from this experiment that free will is also limited by knowledge of our physical state since bodily functions can cause actions. Because, in order for someone to have free will, they must make uncaused decisions, but since bodily functions are constantly causing desires, this means that they must know everything that could possibly cause them to want to perform an action and take that into account when making their decision. For example, if a person calls a friend because he is feeling lonely then he cannot be exercising free will unless he realized beforehand that his loneliness was causing him to want to call his friend. It doesn't mean that he necessarily has to disregard his loneliness, but he has to be aware that it caused a desire in him.

But for normal everyday decisions, no one tries to discover all of their motivations and most actions aren't even thought about. It's only when people are going to make potentially life-changing decisions (like planning a murder) that they carefully weigh all their motivations.

But a patient named Elliot (Damasio 1994) shows that emotions are a vital aspect of decision-making. Elliot had a small tumor removed from his frontal lobe, which left him healthy and with an IQ that was the same. However, after the surgery, he began to have trouble making decisions—even trivial decisions like what color pen to use became difficult for him. He could reason through his options and list the alternatives and probable consequences of each decision that he could make, but this reasoning would continue and continue because he would never settle on a decision.

A clue to the reason for his indecisiveness came from observations by Damasio and also Elliot's family and friends, because they had all noticed that he seemed to lack emotion. So Damasio performed an experiment in which Elliot was shown images that normally create an emotional response (like a hand gun, a nude woman, a burning house, etc) and measured the sweat produced on his palms (because the palms sweat when a person is experiencing strong emotions). Damasio found that Elliot never sweated but reported that he remembered having strong emotional reactions to such images, so Damasio began studying other patients with similar brain damage.

He found that the orbito-frontal cortex (which is located just behind the eyes) played a crucial role in generating emotions and that patients who had damage to this

area all had trouble with the ability to make decisions just like Elliot. He concluded from these results that emotions are required in decision-making

This seems to mean that even if we could rationally weigh all the motivations that were causing us to want to perform a certain action, ultimately our decision might be made for us by an emotion produced by the body. So we can see from these examples that free will is limited to a small number of situations and it is not clear whether or not we can be free to choose our own actions even if we try.

## Chapter Five

### The Afterlife

*The soul separates from the physical body  
and survives the death of the body.*

The first part of our definition of an afterlife involves the soul being separate from the body, so, in order to explore the concept of an afterlife, we will first investigate how the belief in a soul that is separate from the body can arise in humans. To begin with, we will examine the concept of out-of-body experiences (OBEs) and see how they relate to this belief of a separation of body and soul.

The basic feature of an OBE is a sensation that the consciousness is detached from the physical body and often involves a perception that the body is being viewed from outside itself. And reports show that about one tenth of the population has experienced at least one OBE (Blackmore 1984). But for our purposes we won't examine naturally occurring OBEs, instead we will investigate OBEs that are experimentally produced.

The first experiment we will look at was performed by Henrik Ehrsson (2007). The basic setup involved subjects wearing virtual reality goggles while standing in front of a camera that was aimed at their back. The image of their back was shown to them in their goggles, so the participants saw their own body standing in front of them. The participants reported that this already caused them to feel like they were displaced from their body and actually sitting where the camera was located.

Then the experimenter brushed the participant's chest with a pen and made the same motion to the camera so that the participant could see the brushing happening below the "virtual eyes." This sensation intensified the feeling of displacement in participants and they reported feeling as though the sensation came from their "virtual back," as if the body projected in their goggles was actually their own.

But, to test whether the touch sensation intensified the feeling of displacement, the experiment was designed so that some participants saw the brushing come after a time lag from when they felt it happen.

Then, in order to take a quantitative measure of the strength of the illusion, the experimenter, without warning, swung a hammer just below the camera. And skin conductance electrodes—which were attached before the experiment began—measured the emotional arousal produced by seeing a hammer “hit” the participants just below their virtual eyes.

The results of the experiment showed that seeing the brushing happen with no time lag from when the participants felt it happening caused them to be more startled when the hammer was swung. Furthermore, this experiment shows that an OBE can be produced by creating a visual illusion and that the sensation of displacement can be intensified by adding a sensation of touch to the physical body which is seen as happening to the virtual body.

This experiment, of course, doesn't show how OBEs occur outside the laboratory, but it suggests that there is a connection between the integration of visual and tactile perception in the brain. So it makes sense to investigate how perception in the brain works.

Our brain creates the perception of a world of coherent things even though our senses are detecting discrete phenomena. For example, in visual perception, depth, motion, color, and form are all processed independently in different areas of the brain, but we perceive a coherent three-dimensional full-color visual world where objects don't break apart or leave pixelated trails when they move (Bartels & Zeki 2006). The way that the brain integrates discrete information is not completely known, but several brain regions have been identified that integrate sensory input; for example, the *temporo-parietal junction* (TPJ), which is located where the temporal and parietal lobes meet, integrates different types of sensory input, including vision perception and touch perception (Calvert et al 2004). And the next study will show that OBEs can be produced by electrically stimulating the TPJ.

While attempting to discover the location in the brain that was the cause of one of his patient's seizures, Blanke (2006) placed electrodes on the woman's brain in order to map the areas according to their functions. This is done so that the abnormal tissue which is causing the seizures can be located and removed through surgery, while avoiding the surrounding tissues that are still providing essential functions. When the angular gyrus (which is part of the right TPJ) was stimulated, the woman suddenly told Blanke that she could see her own body from above. And, most notably, Blanke found that every time he stimulated the angular gyrus it would produce an OBE in the woman.

Another woman Blanke studied (2006) felt a presence behind her who mirrored her every movement after her angular gyrus had been electrically stimulated. This woman also felt the presence every time there was a stimulation. Both of these women, though, had normal psychiatric histories, so these experiences astonished them because they had never felt anything like them before.

Blanke concluded that these out-of-body sensations are due to the fact that while sensations like vision, touch, and hearing go through initial processing in separate regions, they eventually come together in another part of the brain to create a unified perception. This is why a dog can be recognized far more quickly if its presence in the visual field is paired with its bark.

Furthermore, awareness of the body's position in space is due to the integration of the senses; proprioception takes sensations from the joints, tendons, and bones to create a

feeling of where the body is located in space (which is why humans can still move around in darkness). Blanke concluded that electrically stimulating the angular gyrus in the TPJ compromised the body's sense of location in space, thus giving the feeling that the consciousness was no longer located inside the head.

OBEs can also be induced in several other ways: keeping the mind alert while physically falling asleep and waking up mentally without physically waking (Monroe 1971); sleep deprivation, sensory deprivation, sensory overload, dissociative hallucinogens like dextromethorphan, ketamine, or phencyclidine and other drugs like psychedelics (Bruce 1999); magnetic stimulation of the brain (Monroe 1971); rhythmic sensations like drumming or chanting and extended dancing (Bruce 1999); and there are probably various other ways that have not been studied.

The point we want to grasp for our purposes, though, is not whether these studies disprove anything about souls or even if they replicate "natural" OBEs; what we want to take from these studies is that they show that OBEs can be produced by physical phenomena in normal human beings, which means it's possible that our Man on an Island could have an OBE if he experiences one of the triggers. And some of the triggers are quite common like being mentally awake while physically sleeping, sleep deprivation, sensory deprivation among people who climb mountains or trek through the desert. And some of the triggers are commonly found in religious rituals like hallucinogenic drug use, rhythmic sensations like chanting or drumming, or extended dancing. Blanke's experiment also tells us that an OBE can be triggered by head trauma or a stroke if the angular gyrus is damaged. So it isn't that surprising that one in ten people experience an OBE in their lifetime.

So, for our Man on an Island, let's suppose that he has an OBE either from a natural trigger or a religious ritual. We established in the last chapter that he believed there was some sort of animating essence that made each person different from each other, so now, when he has an OBE, he will feel that animating essence becoming separated from the body. And since he also thinks of this essence as animating the body until death, he will either conclude that the soul dies with the death of the body or that it separates from the body and continues to exist.

But if someone tells him he was dead while he was having the OBE (for example, if he appeared unconscious and was motionless) or if he himself thought he was dead, then he would most likely conclude that the soul leaves the body after death. And since head trauma could easily knock someone out and give them an OBE, the chances of this happening are not that unlikely; especially since it only has to happen to one person for the idea to manifest.

Another event that might form the idea that the soul continues to exist after death is the fact that people are sometimes met in dreams and talked with after they have died. Barrett (1991) performed a study in which she compared dreams people had that involved people the dreamers knew to be dead. She worked with 149 dream diaries that were recorded by 58 males and 91 females over the course of two to six weeks and also a questionnaire that she distributed to 96 students asking them about past dreams they had had that involved dead people.

In the dream diaries, 18 different students reported dreams that involved dead people, which is about 12% of the sample population, and there were a total of 29 reports. The questionnaires also yielded 48 reports of dreams involving dead people.

The study found that there were 4 different types of activities involved in the dreams: the dreamer receives advice from the dead person (23% of reports); the dreamer has a chance to “say goodbye” (29% of reports); the nature of death is discussed (18% of reports); and the dead person tries to change their circumstances and be alive again (39% of reports). And telephone calls with the dead were also found in many of the dreams.

Barrett also found that dreams involving a loved one who died often occur shortly after their death and actually three of the women involved in keeping dream diaries had a friend commit suicide during that time, which generated 11 different dreams about that deceased friend between the three women.

So we can see from this study that dead people sometimes visit in dreams and oftentimes appear in dreams soon after their death.

If our Man on an Island had one of these dreams, he might interpret this event as a visit from the soul of the dead person (since most people in dreams have thoughts, desires, and intentions that differ from the dreamer’s), which could lead him to conclude that the soul survives death. This might especially be the case if he and the deceased person discussed the nature of death, as was seen in some of the dreams reported in Barrett’s study.

And there are actually many present-day hunter-gatherer societies that hold the belief that dead people’s souls return in dreams to visit them (Tylor 1871 & Murdock 1934). So it might be more likely that the belief that the soul continues to exist after death forms from dreams in which dead people visit rather than from OBEs.

Another aspect of the afterlife that is sometimes seen in religions involves the soul having its status determined by its actions during physical life, so we will now take a look at a concept known as the *just world hypothesis*. This is a phenomenon where people act as though the world is fundamentally just, so if a person witnesses something that seems to be an injustice, they blame the victim as if the victim had done something to warrant punishment.

The first experiment we will examine was performed by Melvin Lerner (1966), who conceived of the just world hypothesis. It involved having female students watch a videotape of another young woman going through a learning task in which errors were punished with painful electric shocks. To the students, the woman appeared to be in great pain from the shocks (although she was actually an actor hired by the experimenters) and they had to watch her suffering for 10 minutes. Then the tape was turned off and the students were told one of two stories. The *high-threat* group was told that they were about to watch the woman go through another series of electric shocks. And those in the *low-threat* group were told that the young woman was about to participate in a session where she could earn, based on her performance, anywhere from \$2 to \$8 (the experiment was performed in 1966, so today this would be around \$15 to \$50). After they had heard what would happen in the next set of trials, the students were

given a survey that asked them to rate the young woman on such aspects as likeability, maturity, and attractiveness.

This survey was given before the students witnessed the next set of trials and both groups had seen the young woman go through the exact same series of painful electric shocks, but the answers given from each group differed significantly. The *high-risk* group, which had been told the young woman's suffering would continue, gave the young woman much more negative ratings on the survey than did the students in the *low-risk* group. The only difference between the two groups was that one group was expecting to see the young woman's suffering to continue, while the other group was expecting her to be compensated for her suffering. It is this difference in the scenarios which created a *high-risk* threat in one group and caused them to derogate the young woman in order to account for an inexplicable injustice.

These results agreed with the experimenters' hypothesis that a negative evaluation of the young woman would make her suffering seem less unfair and therefore lessen the threat against thinking that the world is just. And even in the *low-risk* group, the students reported a greater dislike of the young woman when she was rewarded less money.

A different study (Carli 1999) which involved both women and men found results along the same lines. This time, however, the students were given two versions of a story where a man and a woman were interacting. The two versions were told in first-person through the woman's perspective and were identical apart from the last two lines. One version ends with the lines, "Then he led me to the couch. He held my hand and asked me to marry him." The students who read this version were unsurprised that the man proposed and admired the woman, finding her very likeable. The other version ends with the lines, "But then he became very rough and pushed me onto the couch. He held me down on the couch and raped me." The students who read this ending saw it as an inevitable consequence of the woman's behavior and even placed blame on her for the results. So, even though both stories were identical—apart from the last two lines—both groups of students reported that the actions of the woman were a direct cause for the two very different outcomes.

The meaning of the results in these two studies is not that people have no concern for justice, but that in these situations they *see* no injustice. And in fact, other similar studies have shown that study participants find blame in sick people for their illness (Gruman 1983), battered spouses for being beaten (Summers 1984), and poor people for having no money (Furnham 1984).

However, this isn't to say that everyone sees the world as a just place. In fact, many psychologists had noticed that people who had had direct experience with injustice did not hold this belief. A cross-cultural survey that was performed by Adrian Furnham (1991) showed that data agreed with this conjecture and that there were no other distinct cultural differences.

In Furnham's study, surveys were given in 12 different countries (America, Australia, England, Germany, Greece, Hong Kong, India, Israel, New Zealand, South Africa, The West Indies, and Zimbabwe) that scored the participants on their belief in a just or unjust world by using the Just World Scale developed by Rubin and Peplau (1973). These countries were chosen because of their diversity on four cultural dimensions: *individualism*, *power-distance*, *quality vs. quantity*, and *uncertainty avoidance*. Individualism is a measure of the importance a culture places on being self

sufficient in a society. Power-distance is the degree to which the less powerful members think there is an unequal distribution of power. Quality vs. quantity is how important the qualities of competitiveness, ambition, and the accumulation of possessions are to a society as opposed to relationships and quality of life. Uncertainty avoidance is the amount of anxiety felt regarding the unknown and the amount of effort put forth to minimize this uncertainty. Despite the diversity on the four dimensions, only the degree of power-distance showed a statistically significant difference on the just world scale.

So countries whose power-distance was high—in other words, the less powerful members felt a large inequality—rated the world as being more unjust than countries where the less powerful members felt that they lived in more of an egalitarian society. This is exactly what psychologists had conjectured, because countries where the power-distance is high have a higher majority of members who have been exposed to inequality and injustice.

These findings seem to suggest that the just-world hypothesis is something that every human shares and only disappears when we have direct experience with injustice.

Now, we saw that some people do not believe in a just world, so it is conceivable that a religion could develop by people that the just-world hypothesis does not apply to. We will explore this consequence more in Chapter Six: The Evolution of Religion, but for now we will just investigate what happens when the just-world hypothesis *does* apply to our Man on an Island.

If we look at how our Man on an Island would react under the just-world hypothesis, we have to call upon the Other Man again.

We will assume that our Man on an Island has had no direct experience with injustice, so the just-world hypothesis applies to him. This means that if he sees something go wrong for the Other Man, he will think the Other Man is being punished for the wrongness within him or in his actions. And as he continues to see the Other Man being “punished” his conviction will grow that there is *something* meting out punishment. And since the only things that can distribute punishment are authority figures and he never sees the agent that is punishing the Other Man, he will most likely deduce that the punisher is a deity.

So we can see that under the just-world hypothesis the Man on an Island will ultimately conclude that there are deities that punish people for the wrongness within them or in their actions.

(On a side note: we have to remember that this doesn’t mean that every person who believes in a religion which has judgment believes in a just world, this is merely the phenomenon which *invented* the judgment aspect of afterlife.)

But that is the extent that these psychological phenomena tie things together for an afterlife: they create the belief that the soul can separate from the body and live on after death and that there might or might not be deities meting out punishment.

Now we can see that these phenomena still leave lots of open questions about the afterlife. This conception of the afterlife also leaves the question of where the soul goes after the body dies completely open. It is not until the religion evolves that these questions are answered.

The fact that the four key aspects do not provide a complete accounting of the afterlife could explain the variations in each religion's belief in the afterlife since the resolution of these unanswered questions comes as a religion evolves. And this concept will be explored more in the next chapter, when we examine how religions evolve and tie the last threads together.

# On Death and Near Death Experiences

## Death

Obviously, death is a critical aspect of an afterlife, so it makes sense to investigate what happens when people are thinking about death. When someone is aware of their own eventual death, they are *mortality salient* and Rosenblatt et al (1989) performed several experiments investigating this concept.

In the first experiment, the participants were all municipal court judges. They were presented with a hypothetical prostitution case that resembled the cases they normally see and asked to set the bond for the alleged prostitute. (The reason the experimenters chose a prostitution case was because they thought the crime's moral nature would be emphasized.)

Before seeing the case, though, half of the judges were placed in a mortality salient group by having them answer a questionnaire that asked them about their thoughts and feelings concerning their own death; the control group was given no such questionnaire. The results of the experiment showed that the mortality salient group set an average bond of \$455, whereas the control group thought a lesser \$50 average bond was fitting.

And the experimenters concluded that the mortality salience increased the judges' "need for faith in their values" and "desire to punish the moral transgressor." But they also saw that their results could have been accounted for by the judges simply being in a "bad mood" after the questionnaire, which "predisposed the judges to treat the defendant harshly."

So they designed another similar experiment which used college students, because they wanted to compare subjects who had a negative attitude toward prostitution against those who didn't (and obviously they couldn't use judges for the second group). This way they would be able to show whether the results had come from a "bad mood" in the subjects or their "desire to punish the moral transgressor" after contemplating their own deaths.

Since the experiment was almost identical, but the participants were not judges, the experimenters used the same setup but also provided instructions that explained how bond-setting worked and that it usually ranges between \$0 and \$999 for alleged prostitution. Then, the participants were given a questionnaire which assessed their attitudes on prostitution and divided into a positive and negative group which each repeated the experiment that had been used with the judges.

The group that was representative of the judges (negative attitude toward prostitution) had the same results as the judges, with the mortality salient group averaging

\$413 and the non-salient group averaging \$78. However, the group that had no problem with prostitution did not have a statistically significant difference between the two bond assessments (salient \$145 and non-salient \$117). Another result to note, though, is that the two mortality salient groups showed significance in their difference in that the group that had a negative attitude toward prostitution set a much higher bond than the positive attitude group.

But there was another difference to this experiment that distinguished it from the first one with the judges: after the experiment seemed to be over, the participants were given a questionnaire for evaluating the experimenter. And there were no significant differences between any of the groups on their rating of the experimenter.

We can see from these results that causing someone to think about their own death does not make them wish harsher punishment on every target, but only those they see as immoral. Mortality salience did not affect the bond assessments of those who saw no problem with prostitution, because they did not see the prostitute as a “moral transgressor.” And mortality salience also did not affect the rating of the experimenter because she did nothing that violated anyone’s values. It was only in the group that saw prostitution as something immoral that mortality salience made them wish to increase the punishment, which shows that the contemplation of death creates a desire for justice.

These results seem to suggest that merely thinking about death could strengthen the desire to have an afterlife that involves some kind of “ultimate” justice in which moral transgressions are punished (if the belief in an afterlife that involves punishment already exists in the person).

Another study by most of the same authors (Greenberg et al 1990) investigated the effect that mortality salience has on cultural worldview. The setup for this study was similar to the judge study where there was a preliminary questionnaire that divided the participants into a salient and non-salient group, but then the two groups (who were all American) had to read one of three interviews which differed in their attitude (*positive*, *mixed*, and *negative*) toward the United States.

After they had read the interview, participants were asked to evaluate the likeability of the interviewee and their agreement with the interviewee. For the mortality salient conditions, there was a significant difference in the evaluations of the negative, mixed, and positive interviews for both likeability and agreement with the positive interview having the highest values for each condition. The non-salient groups had no significance between any of the measures so that their negative article evaluations were higher and their positive article evaluations were lower than the salient group on both likeability and agreement.

The experimenters also performed a similar study in which salient and non-salient Christians had to evaluate descriptions of two people—one who was obviously a Christian and one who was obviously a Jew. And again in this study, the mortality salient condition caused more positive evaluations of people who shared their beliefs (the Christian) and more negative evaluations of those who opposed their beliefs (the Jew).

And in an experiment by Norenzayan & Atran (2001), the experimenters found that religious commitment in general was affected by mortality salience. In the experiment, a control group was given a survey which asked them to reflect on food while the experimental group was asked to reflect on their own death. The results

showed that people in the mortality salient group reported that they believed in the Christian deity (the experiment was performed in America) more often than those in the control group and they also reported that they were religious more often than the controls.

So we can see from these results that mortality salience also makes evaluations of *in group* members more positive and increases religious convictions in general. This could contribute to a belief that all of the believers in a certain religion will be together forever. It also could account for the sudden *return to belief* that many people who turned away from religion exhibit when they are in their last hours before death.

## Near-death Experiences

There is also a similar experience to the OBE known as a near-death experience (NDE). NDEs have been being reported since as far back as Plato (around 427-347 BCE) who related a soldier's tale about an NDE in *The Republic*. And in a study performed by a cardiologist in the Netherlands, Van Lommel et al (2001) found that in a group of patients that had been revived from cardiac arrests, 18% (62 patients) reported having an NDE and 12% (41 patients) had reported NDEs that shared a core experience. Another study in Australia (Perera et al 2005) found similar results with a telephone survey, finding that 8.9% of the population reported experiencing an NDE. And, interestingly, we can see from these studies that the percentage of the population that has experienced an NDE is very close to the percentage of the population that has experienced an OBE.

In the typical NDE, the person having the experience usually reports getting a glimpse of the afterlife. Some NDEs seem to share common experiences, but in analyzing several studies Mauro (1992) found that NDEs are for the most part culturally specific and variable, although they have a similar *core* experience.

The basic core experience that was reported across cultures was a sense of separating from the body, of traveling through a tunnel, and seeing a bright light. But the cultural differences among NDEs that Mauro reported vary greatly. In a study of 400 Japanese NDErs, there were many reports of seeing fields of beautiful flowers and rivers with dark water, which are both frequent images found in the Shinto conception of the afterlife and in Japanese art. In East India, NDErs reported that they went to what seemed to be a giant bureaucracy and that their arrival there was a clerical error so they were sent back to their body. People from America and England report the core experience and then say they were sent back to the physical world for love or due to unfinished business. And the natives of Micronesia reported that the afterlife was a city busy with cars, lights, and tall buildings.

We can see from these reports that parts of NDEs may be colored by culture such that people are seeing what they expect to see. This can be attributed to the fact that when a person thinks about something repetitively before sleep, they tend to dream about what they had been dwelling upon; and this has the same effect on hallucinations (Kapur 2003). So a person who thinks they're dying might be dwelling upon the afterlife just before they became unconscious, which might influence what they saw if a hallucination or dream was involved in the process.

There is still the core experience, though, which is reported cross-culturally; however, the aspects of the core experience can also be explained by physical means. The separating from the body could just be an OBE, which we already investigated, but the bright light and tunnel can be explained by the occurrence of phosphenes. Phosphenes are a phenomenon in which a person sees light without having any light entering their eye. These can be caused by having neurons in the visual system that are randomly firing and are often seen by people who have been subjected to visual sensory

deprivation (Oster 1970). They are also sometimes seen by people during meditation (Nicholson 2002) and sometimes prior to fainting (Oster 1970).

The typical sights that are reported involve both random and patterned configurations of light that can be colored or monochromatic (Hori et al 1993). There have also been reports by those who have experienced phosphenes of seeing a scene where it appeared that they were moving through a tunnel (Germaine & Nielsen 1997).

So the entire experience can be explained by a hallucination or a dream being colored by thoughts of the afterlife associated with a particular culture, and an OBE paired with phosphenes. And we have just seen that these are all things that can happen to a person that is losing consciousness.

But some evidence that NDEs might be a physical phenomenon came from Strassman's (2001) study on dimethyltryptamine (DMT). When he injected volunteers with DMT in high doses, he found that they felt like they had gone to "non-corporeal, free-standing, independent realms of existence inhabited by beings of light who oftentimes were expecting the volunteers, and with whom the volunteers interacted" (2008). Strassman conjectured that the pineal gland releases large amounts of DMT when the body thinks it's dying and was therefore responsible for causing NDEs.

And another study performed by Jim Whinnery (1997) provided evidence that suggests that NDEs can be explained entirely by physical means. His research involved spinning pilots in huge centrifuges that accelerate them to 9 times the force of gravity in a matter of seconds. This usually causes the pilots to blackout since their brain gets deprived of oxygen and they afterward report having an out-of-body experience, a feeling like they had gone through a tunnel, and a general sense of euphoria. And they also have short dreams that involve people that they have met that are still alive. But all of this happens just because the brain was deprived of oxygen—the pilots were never near death.

So we can see that the evidence from these studies show that NDEs can be explained by physical means, although whether or not NDEs are a physical phenomenon says nothing about the existence of an afterlife.

## Chapter Six

### **The Evolution of Religion**

Now let's look a little more concretely at who the Man on an Island represents. Around the time that modern humans first appear in fossil records (which was about 195,000 years ago) man was living in bands of less than 100 people (Shermer 2008). So it would have been possible for someone to communicate with the whole band at once since the numbers were so small.

This means that if one of them invented a ritual, that person could alert the whole band in order to have everyone witness the efficacy of the ritual. For example, if someone invented a healing ritual of placing mud in certain patterns on the afflicted person's body, then the whole band could watch to see if the ritual worked or not. In this way, then, the whole band becomes believers if the ritual works and the band itself can therefore be represented by the Man on an Island.

And this extends to the other key aspects also. If there was a band that lived near the ocean, they might develop a ritual for bringing treasures like shells, animals, etc to the beach (which appear because of the tides) and then they might develop the concept of a deity of the sea that is rewarding them with these treasures. And the whole band would be able to witness the rewards and develop the concept of the deity of the sea together.

This efficacy testing will also give rise to priests, which is the topic of the next section and which is crucial for the development of the concepts of the soul and the afterlife.

## The Priest

A very big factor in the evolution of religion is the presence of the priest (which we will define as *the religious expert of a certain people*). This is because people naturally ask why things happen and for things they can't answer themselves, they ask others who have more experience. Thus religious experts will naturally arise among people who have lots of unanswered questions. It would seem then that priests would be important to people who don't have scientific theories and we can see this in modern hunter-gatherer societies, where even the least structured ones with hardly any political leadership have religious authorities (Norbeck 1961). Moreover, there are many societies that have only a religious leader and no political leader, but the number that have no religious leaders is very small (1961).

But priests are subjected to competition just like everything else: if they can't show their efficacy, then they are replaced by one who can. For example, in some present-day hunter-gatherer societies, the prestige of a shaman is determined by whether their healing rituals can cause people to become well or whether they can invoke the rain with rainmaking rituals, etc (Lowie 1952). Now, this isn't as impossible as it sounds, because, since many illnesses pass after a short time a healing ritual has a good probability of seeming to work and a good shaman can also learn weather patterns so that the probability that his rainmaking ritual will work can also be high.

So people will naturally come to the priest with questions and this competition aspect means that the priest must have answers to questions or they will be replaced by a priest who does. The answers that the priest provides depend somewhat on their credibility, but mostly on the credibility of their answers because they can be replaced.

So the priest will have to invent (or dignify someone else's invention of) a concept of a soul that incorporates our definition, because, since everyone in his band has a theory of mind, they will all notice the essence that makes other people different and therefore only accept a belief that takes this into account. The concept of an afterlife will also need to involve the soul separating from the body and continuing to exist after death since they have all seen the animation leave the body at death and perhaps been visited by dead people in dreams or heard someone report that they had an out-of-body experience and the band will only accept a belief that takes these attributes into account. The priest will therefore help to invent each of the four aspects as the basis of the band's religion (and thus serve as the Man on an Island).

It is evident that priests must continue to win their people's favor in order to keep their position, so besides showing the efficacy of their rituals, they also must be able to explain everything about their religion.

Because of this, they must invent etiological stories, which is the topic of the next section.

## Etiological Stories

We will call etiological stories those *stories that explain the causes or origins of things like deities, rituals, names, heroes, rules, etc.* These could be told by the priest or someone else in the band who has storytelling talent, so we will refer to the person who recites the etiological stories as a storyteller in this section. For most of human history, the storytellers would have been reciting to an audience, since literacy did not become common until a few thousand years ago (Ostler 2005), so the attitudes of the audience would have affected which stories continued to be told by whether or not they liked a particular story.

Moreover, if people are going to continue listening to a storyteller, he must tell interesting stories, which means that the storyteller might change certain aspects of the story to make them more appealing. However, if the storyteller alters any of the four key aspects from what the people believe, the stories will be seen as false and disregarded. Basically this says, then, that the myths that are passed on are the ones that do not conflict with their beliefs and have been made the most interesting.

We can see evidence of alteration even in modern etiological myths. For some reason, people continue to be taught that Christopher Columbus stumbled onto the Americas when he was trying to prove that the world was round. For him to have claimed that would have been like someone saying that they were going to prove that they would fall if they jumped off the roof of their house, because every educated person (and especially mariners who used the fact for navigation) knew the world was round by the time Columbus was born. The Greeks had conjectured that the earth was spherical as far back as the 6<sup>th</sup> century BCE, but they weren't able to establish the conjecture as fact until the 3<sup>rd</sup> century BCE when their techniques of astronomy had improved (Dicks 1970). So by the time that Columbus sailed for the Americas the earth had been known to be round for about 1,800 years. But he was attributed with having discovered America, so it makes sense that setting out to prove the world was round would replace the fact that he set out in order to establish a better trade route, because it's a much more appealing idea.

There is probably an etiological myth associated with every legendary character, like the story of Newton having an apple fall on his head and George Washington chopping down the cherry tree. These discrepancies could arise from pure invention by a storyteller, or they could be a result of something like the distortion of facts due to memory.

Memory is a major source of information corruption as the next study will show. Loftus and Palmer (1974) performed a study on post-event distortion in the memory of eyewitnesses. In this study, two groups were each shown the same photographs of a car

accident, and then were asked one of two questions afterward. The first group was asked, “About how fast were the cars going when they smashed into each other?” and the second group was asked the same question, but with the word *smashed* replaced with *hit*. Then, a week later, the participants were asked to report whether there had been broken glass in the photographs of the car accident (although there was no broken glass in the actual pictures). In the group that had been asked if the cars *smashed* into each other, 32% of the participants reported that there was broken glass in the pictures, while in the *hit* group only 14% reported seeing broken glass.

These results suggest that the questioning of witnesses can change their memories of events, which is known as retroactive interference. And we can see how this could cause history to change by causing people to remember events wrong, because significant events are usually followed by questions even among the witnesses.

So we can see that some etiological stories will be distorted versions of historical events and people. But we also know that if deities and rituals, etc are invented, storytellers and priests will have to come up with completely invented stories if they need to answer people’s questions about the origins of deities and rituals, etc. This invention, though, will serve to embellish the four key aspects and make them more fleshed out. For example, Hesiod describes an etiological story in the *Theogeny*, explaining why the Ancient Greeks sacrificed only the bones and the fat of animals and not the meat, which involved a trick that Prometheus played on Zeus. So in this case a reason for performing a ritual is invented, but it also serves to flesh out the personalities of two of the deities and their relationship with each other.

And there is evidence that religious stories change as can be seen in the flood story of Genesis. Scholars (Cassuto 2006) have formed what is known as the *documentary hypothesis* (in order to explain inconsistencies in the text), which is that there were four independent sources that were combined to form the first five books of the Old Testament. These four sources, however, follow consistent patterns as we will see in the flood story.

The flood story was derived from two different sources identified as J and P. The J text is thought to have been written around 950 BCE and the P text in 500 BCE while the Jews were in exile in Babylon. Some basic linguistic differences between the two texts are that the J text uses the word “died” while the P text uses the word “expired” and that J always uses the proper name “YHWH” to refer to their deity while P calls the deity “elohim” which is a description, not a name.

But there are also distinct differences in the story. J has Noah release a dove while P says it was a raven and the J account says that the rain lasts for 40 days and nights and then the water recedes for the same amount of time while the entire event is said to last a full year in P. And this is a difference to note, because there are also two creation stories in Genesis. In P, the universe is created by separating water so that there is water above and below the universe and in the flood story of P, this water flows into the world to cause the flood and the word “rain” is never mentioned. Since there was no separation of waters in the J source, the flood story involves rain in that version.

The number of animals is also inconsistent between the two sources, because P has two of each species while J has two of each species of “un-pure” animals and 14 of each species that Noah will sacrifice.

But there is also a difference in the way each version treats their deity, because J who refers to his deity by a proper name also uses many anthropomorphic descriptions of his deity, which are not found in the P version of the story.

So the flood story of Genesis provides evidence that a religion's etiological stories change over time and perhaps also that the way believers conceive of their deities also changes over time.

## Evolution of Ritual

Rituals evolve through further pairings of non-contingent reinforcement. Another behavior can be paired with a ritual that was already on a non-contingent schedule by performing the two behaviors together and having them be coincidentally reinforced. For example, if there was a ritual of hand gestures that was on a non-contingent schedule with the coming of rain, then if a certain tune was whistled before these hand gestures were performed and it coincidentally rained, the whistling could then get included into the ritual. And this is a recursive formula, so once one new behavior is added to the ritual, another can be added in the same manner. Ceremonial clothing can also be added in this way as well as altars and churches and days of worship etc, because they can all just be coincidentally reinforced with the other rituals.

Rituals in a sense become rules for behavior and when someone notices that a certain behavior elicits punishment from a deity they might form a rule against that behavior. So in a sense rules against certain behaviors are *negative rituals*, or rituals that shouldn't be performed because they lead to negative consequences.

Rituals can also evolve by having the priest create or alter some aspect of them. For example, the priest might notice that the clouds have been angry for several days and decree that something greater than incense needs to be burned like part of the crops they harvested. This form of ritual could develop out of an intuition or feeling that the priest had or it could also develop out of corruption; for example, the priest could decree that people needed to buy certain idols because he had been paid by the idol maker.

And we can see actual examples of ritual alteration in certain differences between the Jewish and Christian religions, although we don't necessarily know what the purpose behind changing the ritual was or sometimes even who changed the ritual. One example is that Christians worship on Sundays while Jews worship on Saturdays. Another is that Catholics perform some of their worship service in Latin while Jews perform some of their service in Hebrew. And there are of course many more rituals that were probably altered in this way.

## Evolution of Deities

In Chapter Three, we saw that the psychological phenomena that invented the deities could also evolve deities by assigning more authority to them and further anthropomorphizing them. But there are also other ways they can evolve.

If there is an animal that is often present when the believers are receiving rewards or punishment from their deity, they might consider it to be associated with the deity as a messenger, incarnation, or representative, etc (although it could also be the case that they think that animal is a deity). For example, if a falcon is constantly in the vicinity when people are giving birth, the believers might think it had some association with their deity of childbirth if everything went well. But the formation of animal associations will not happen for every religion, because it is based on chance and seems to be somewhat unlikely since a certain type of animal would have to be present around humans quite often.

And of course the formation of etiological stories also applies to deities, so priests and storytellers will invent stories that will also contribute to the evolution of each deity. These might be formed by witnessing interactions between the animals associated with certain deities. For example, if the raven was seen to be associated with a death deity and the worshippers saw a falcon whom they considered associated with a deity of childbirth chase away a raven that had been watching over a birth, then they might form a story about a quarrel between the deities and may even assign some importance to the child that was born. In this way, the deities will begin to have a more fleshed out personality and also relationships between each other and with humans.

But etiological stories can also be formed from the way that the deities “act” at certain times. For example, if a large storm rips up trees, the believers might form a story about their storm deity fighting with their deity of the forest. Or if someone drowns in the ocean, the believers might form a story about the sea deity claiming that person’s life.

Etiological stories might also be invented to name the deities or to establish relationships (like familial relationships, friendships, hatreds, etc) between them or to explain how they became associated with certain animals. These could arise based on the “actions” of the deities as in the previous example, or they could be based on the nature of each deity. For instance, since storms bring rain, the believers might invent the idea that their storm deity was the father of their sea deity and then form a story about the birth of the sea.

And in all the previous examples, the reason etiological stories might develop from certain events, natures, etc is because if many people witnessed those events, then they would be more likely to believe a story that involved those events.

We saw in Chapter Three, that deities don't have to be anthropomorphized at all, so the most basic form a deity can take is a deity that just has authority over one thing and is formless. We also showed that their authorities can be increased, so there could be deities that were formless but controlled many things up to the point that one deity controlled everything. But if deities show certain characteristic movements, they tend to get anthropomorphized and their anthropomorphism can range anywhere from one trait to being completely humanlike. (One thing to note, though, is that even though deities might be represented by animals, the animals will be anthropomorphized and act like humans not their respective species.) So there can be 8 different kinds of deities, but there also seems to be a tendency in the way they are formed.

Due to the psychological phenomena that cause them to be formed, anthropomorphism tends to build toward a human-like representation and authorities tend to increase in number, but a decree from a priest could reverse both of these tendencies. Not every deity has to follow this path, but from the way that authority is formed and the way that they are anthropomorphized, it seems that deities will tend to start out as a formless deity with authority over one thing, then become more anthropomorphized and have a few more authorities assigned to it until it reaches a humanlike state in which it has control over several things. This means, then, that without interference, religions have a tendency to evolve toward a pantheon (since Chapter Three showed that monotheism was more rare than polytheism) with human-like deities that each have one or more authorities.

Another way deities evolve is by being introduced to other sets of beliefs, which can happen through evangelism, combining tribes, or by conquest.

When one tribe conquers another, the conquering tribe will almost certainly keep their deities, because they would most likely think the success of the war was a result of the strength of their deities (since war is usually on a non-contingent schedule, most tribes will have war deities). For the conquered tribe, though, whether or not they give up their deity depends on the people and their religion. If they think their deities weren't powerful enough then they will most likely begin worshipping the conqueror's deities who demonstrated their power during the war. But if they assign blame to themselves, then there is a chance they will keep believing in their own deities, because they will want to win back their deities' favors (although they might have to worship in secret).

If many tribes are combined that all had a pantheon, there would most likely be an overlap of authority between the deities of each tribe, but if it was a friendly alliance, they would want to come to some kind of compromise. They might demonstrate their rituals to see which one worked for a deity of a particular authority, so there are three possible results from such a demonstration. Their deities of a particular authority might respond to both of their rituals, in which case the people would probably think they had been worshipping the same deity the whole time and combine their etiological stories (and there is a chance at this point for a monotheistic religion to develop if they find that one ritual works in all situations). The deity might also respond to only one of their rituals, which would have the same effect as in the conquered tribe above. Or the deity might respond to neither of their rituals, in which case both sets of believers would respond like a conquered tribe. However, since rituals are on a non-contingent schedule, extinction of the ritual takes a very long time, so it seems that a tribe would not "give up" on their deity quickly enough for a coincidental reinforcement not to happen, which

means that the deity will most likely respond to both of their rituals eventually. In all three cases, though, someone will create an etiological story to explain what happened.

Nevertheless, it is possible that efficacy testing of rituals will not appease everyone or that it simply cannot be done in every tribe's presence, especially if there are many tribes combining or the population of each tribe is large. A possible compromise in this situation would be for a single deity to be invented that replaced all of the other deities. In this situation, no one would feel that their deity was conquered or that they had lost the favor of their deity. This isn't to say that it happens every time this situation arises, though, it is merely a possibility.

But the combining of tribes brings up another point about the evolution of deities: as a population increases, the deities become harder to change because their efficacy can't be shown to the whole group at once. So once a population reaches a certain size, whatever deities the population collectively believes in will for the most part remain static.

One other note is that we mentioned before that the psychological phenomena we have investigated in the case of deities produces belief in deities and obedience to them, but this doesn't necessarily produce respect for or absolute obedience to their deities. We saw in the Milgram experiment that the more remote the authority figure became the less obedient people acted. So the degree of how remote their deity seems to them will determine how obedient or respectful they are to their deity. This is why people sometimes do things and hope their deity won't notice or disobey certain rules and hope their deity won't become angry.

For example, when Radcliffe-Brown (1922) was studying the Andaman Islanders, he learned from them that they believed their storm deity Biliku would punish anyone who melted beeswax, but they did it anyway and just hoped Biliku wouldn't notice.

## Evolution of the Soul

One of the ways the concept of a soul can evolve is by creating the belief that other things have souls besides humans. The invention of this belief could stem from several triggers: people seeing that other animals seem to have intentions, thoughts, and desires and/or seeing that the *something* that animates the other animals leaves after death just like in humans; the fact that plants are alive and grow and die; that other animals, plants, and even inanimate objects play a role in dreams; and there could also be other triggers. The belief that other things have souls could also just be a conclusion drawn by someone who thought it seemed logical that other things would have souls besides humans.

So the concept of the soul can be extended to other things besides humans (which is seen in *animism*), but it can also be taken one further step: instead of thinking of each thing as having separate souls, someone might invent the concept that all souls are connected or part of one soul. This is most likely how the concept of *Brahman* was formed in Hinduism and the reason for one of the major differences between Hinduism and the Abrahamic religions since the Abrahamic religions originally held the belief that only humans have souls.

*Totemism* could also form in a similar way through triggers like seeming to be watched over by a certain animal, being attacked by an animal but having it seem to spare your life, just having a particular plant or animal living where you live, being visited by an animal or plant in a dream, etc. If the people attached some significance to the trigger (perhaps because it continued to happen) and tried to figure out why the trigger happened, their priest or storyteller might invent the idea that there is some sort of kinship or relationship between the person and the animal or plant. And the trigger can also happen to the whole tribe, which could make the totem apply to the whole group. In this way, then, a particular animal/plant or a species of animal/plant can become identified with an individual or a group.

Etiological stories will naturally solidify and flesh out all these beliefs. But we can see from this section that animism and totemism arise by chance, which is why they are not found in every religion.

## Evolution of the Afterlife

We have seen from Chapter Five that the Man on an Island believes the soul can be separated from the body and that it continues to exist after physical death and he also might believe that deities punish people for the wrongness within them or in their actions. The question of where the soul goes after physical death, though, was left unanswered.

There are essentially only two places that the soul can go after the body dies, though, it can either stay on earth or go to an entirely different realm. Where the soul goes and what it does when it gets there, though, have to be invented by priests and storytellers. And they will sometimes invent a deity with authority over the afterlife (which means it has the ability to reward and punish souls), especially if punishment is included.

But there is another factor we need to explore in terms of punishment and the just world hypothesis, so we will invoke our Man on an Island one final time. This other factor is the fact that if our Man on an Island believes in a just world, then he must believe that every transgression gets punished, but he also sees that some transgressions are not punished. The *belief disconfirmation paradigm* (which is explained at the end of this chapter) tells us that he will not necessarily change his belief in a just world, but will decide that there is a reason those transgressions were not punished (and will actually consequently strengthen his belief in a just world). And there are only three logical reasons that the transgressions could have been left unpunished: they have been forgiven, they have gone unnoticed, or the punishment has been reserved for later. This last reason, of course, could lead to the conclusion that there is punishment after a person dies.

So our Man on an Island will create the belief that the soul either stays on earth or goes to some other realm and might form the belief that there is punishment in either place. The inclusion of punishment naturally leads to the concepts of reincarnation, a heaven and hell, and even ghosts that have to haunt old castles, among other things. And the exclusion of punishment can account for beliefs in the afterlife like souls that aimlessly wander the earth, souls that go to a place of rest, or that the afterlife is determined by the manner in which a person died, not how they lived, etc.

In either case, our Man on an Island could come up with such ideas as the possibility that the soul can get lost on the way to the afterlife or that it can watch the people of earth from the afterlife, etc.

There are basically four types of afterlife, then, determined by whether the soul stays or leaves earth and whether there is punishment included wherever the soul goes. Etiological stories will of course flesh out each type, which accounts for the diversity in each religion's conception of the afterlife. And a religion's belief in the afterlife could conceivably change between types. It seems though that it would be easier to add concepts instead of trying to take beliefs away (due to the belief disconfirmation

paradigm), so there might be a tendency for the changes to be from an afterlife on earth to one in a different realm and an afterlife with no punishment to one that has punishment. But there is also no solid reason that changes couldn't happen in the opposite direction.

And one final note needs to be made, regarding funerals. Funerals could possibly strengthen the belief in an afterlife due to all the preparation that goes into them. Since the people performing and attending the funeral wouldn't necessarily know that the rituals had been invented, they might naturally conclude that funeral practices were established because they had some kind of effect on the dead person's soul (like helping it find its way to the afterlife). This would have a tendency to strengthen a person's belief in the afterlife and reinforce the belief that funerals are needed and therefore increase the likelihood that the funeral ritual would continue.

## Further Notes

Language, of course, is the only way that ideas are spread. If humans did not have language, then every person would have to discover every idea. Even in imitation the imitator must discover for themselves if there is any meaning behind what they are imitating (which we will see in the next section can lead to inaccurate conclusions). For example, seeing someone hammering nails into two boards is a behavior that can be imitated, but imitating the behavior does not bring understanding that the purpose of the hammering was to secure the two boards together with a nail—that idea must be either conveyed through language or discovered by the imitator. And without language people could never compare ideas, which means they could never learn if there was a better idea than the one they had without discovering it on their own.

How priests come about depends on the people. Their efficacy certainly plays a role, so some religions might just elect anyone who has good answers or effective rituals to be a priest. It could also be by birthright or something like having an odd birthmark or being born during a violent storm or surviving a snake bite or some other mystical sign.

But when a priest loses his efficacy, this won't decrease belief in the religion, it will decrease belief in that particular priest, because a new one will be found who can demonstrate their efficacy, so the people will merely think that the first priest lost favor with their deities or something similar since the deities are still rewarding rituals.

## Partial Evidence

Immediately after World War II, religious practices that became known as *cargo cults* suddenly appeared in many of the tribal societies in the Pacific Islands (Attenborough 1960). They were termed cargo cults because they developed after the local people saw large amounts of supplies arriving to the islands on cargo ships and planes. The local tribes lived in pre-industrial societies, so when they saw soldiers arriving with advanced technology they were completely in awe. And the way they acted shows that they thought the technology was given to the soldiers by a deity.

They would often imitate the marching drills that they saw soldiers performing, using sticks instead of rifles and painting designs on their bodies to look like the soldiers in their uniforms. And they would build imitation airstrips, offices, etc to match those of the soldiers and would even have “air traffic controllers” wearing headphones made out of coconuts.

The apparent reason the tribal societies would act in this way was because they never saw any of the soldiers make any of the technological marvels; the marvels all just arrived on cargo ships and planes while the soldiers performed actions that were inexplicable to the local people. Even if the soldiers explained that their technology was made by men back in their home country, the local people would not understand or would think the soldiers were trying to deceive them.

So if we look at this situation in terms of the key aspects we have developed, we can see that non-contingent reinforcement and obedience to an authority figure can account for the local people’s actions. Now, this isn’t exactly how a religion would develop, because in this case they are imitating what they think are other people’s rituals, but it can provide a little bit of insight. But basically, the ritual of marching drills is on a non-contingent schedule, because every time the tribal people perform it in the absence of the soldiers it will not be reinforced; however, they saw the ritual be coincidentally reinforced when the soldiers performed the ritual, because the cargo planes and ships would have arrived on days that they performed their marching drills since they would have performed them every day.

And they see that an unknown entity is rewarding the soldiers with technological marvels that they think could only have come by supernatural means, so they deduce that the ritual is being performed for a deity which rewards them with the marvels. (And perhaps they even think that the deity is punishing the soldiers when their marvels malfunction or break.) Sometimes the local tribes would think one of their own deities was the one providing the rewards and sometimes they created new deities like one tribe which worships Prince Phillip, the Duke of Edinburgh.

So, while this is not entirely conclusive evidence, it is consistent with the key aspects that are involved.

## Chapter Seven

### **In Conclusion**

In summary, the basic way that religions are invented is by: having a ritual form by non-contingent reinforcement; and then having this ritual be transferred to the authority that seems to determine whether they are rewarded for performing their ritual; having a person notice that every other person has thoughts, intentions, desires, etc that differ from their own and that these seem to animate the body; and then having a person notice that other people's thoughts, intentions, desires, etc end at death when the animation ends, but that these can return in dreams. And finally, these aspects are fleshed out with etiological stories that are invented by priests in order to keep their credibility high so that they don't get replaced.

And we can see from the preceding chapters that each of the key aspects requires some kind of experience. But the experiences are also not rare, in fact, most of the required experiences could happen to just about any living person. And we also saw with the cargo cults an example of beliefs developing out of a lack of understanding, because the tribal societies who did not understand how the technology could be built formed rituals and deities, while the soldiers who did understand how the technology was built did not form any aspects of a religion.

So, over the course of the preceding chapters, we saw that in a *completely naïve* human, certain psychological phenomena can produce a set of beliefs that contains rituals, deities, and an afterlife that includes the concept of a soul. And when these beliefs evolve and are combined with etiological stories, they form a religion.

Therefore, in the absence of knowledge, humans will invent a religion.

## On Belief Disconfirmation

The belief disconfirmation paradigm is part of cognitive dissonance theory, which is the drive that people have to reduce the discord caused by simultaneously believing in two ideas that conflict with each other. There are several different paradigms of cognitive dissonance, but one of the first examples of it was provided by Festinger (1956) in order to explain the actions of a cult whose prophecy failed.

When he heard that a woman believed she had been sent a message telling her the world would end in a great flood on December 21, 1954, Festinger and a few associates infiltrated the group in order to get a closer perspective. The woman claimed the message had come from alien beings who promised to rescue her and her group of believers on a flying saucer before the flood came. The group was so devoted to their belief in the message that they all quit their jobs and gave away their money and possessions since they would not need them on an alien planet. But then December 21 passed and no alien ship came nor did the world end in a great flood. To all non-believers this was proof that the message was false, but Festinger had studied the group because he knew from cognitive dissonance theory that the failure of the prophecy would not cause them to give up their belief, in fact he predicted that it would strengthen their belief.

To relieve the dissonance between believing that the prophecy was true and knowing that it didn't come true, the group decided that the aliens had changed their minds and given earth another chance, so they felt it was their duty to spread the word. So even though their prophecy had failed, they began to tell more people about it and recruit more members, and they even contacted newspapers to give interviews which they were reluctant to do before the incident.

Festinger stated that there were certain conditions that would cause someone to follow the belief disconfirmation paradigm. One was that the believer must have a large investment in the belief that would be difficult to get back. And the greater the investment, the greater the believer will be committed to their belief after it has been disconfirmed. Another condition he specified was that single believers are less likely to increase their belief after a disconfirmation than a group of believers, since the group can provide support for each other. And both of these conditions were demonstrated by the group Festinger infiltrated, because they had much social support in their group and they had all quit their jobs and given away their possessions.

So this study shows that disconfirmation of a belief doesn't always lead to the repudiation of that belief, which is why providing evidence that a belief is wrong will not necessarily make a person abandon that belief if their investment in it is strong enough.





## **Part 2**



## Chapter Eight

### **The Origins of Morality**

Naturally, it makes sense to wonder where morality comes from if it isn't given to man by a deity. The evidence we will investigate in this chapter suggests that morality developed independently from religion, but was later incorporated into some of them.

Tylor (1871) provided evidence that this was the case in various hunter-gatherer religions, because their religions did not articulate any "ethical laws"; however, he found that the hunter-gatherers had definite morals that had arisen by some other means.

So it seems very likely that humans have taught morality to themselves or acquired it through means other than religion. Charles Darwin (1859) noted that cooperation and altruism provided a distinct evolutionary advantage because cooperation among family members improves the survival chances of offspring and cooperation can also benefit entire communities. For example, in a community of vampire bats, on any given night, some bats cannot always find prey to feed on and some are able to find a surplus of food. So the bats that find a surplus will consume more food than they need and regurgitate some of it to feed a bat that did not find enough. In this way the survival chances of the entire community are increased because each individual can count on the other group members to provide food when they do not find enough (Wilkinson 1988). So a behavior that has a disadvantage for individuals (giving away food) in the short term is selected for because it increases the probability of mutual interactions (getting food in return) in the future.

In another more general example, warning calls that a predator is near provide a short-term disadvantage to the caller because it alerts the predator to their position; however, if the warning call prevents the predator from catching anyone from the caller's community, then the caller will have a long-term advantage because predators tend to hunt where they have a good chance of catching food, so the caller decreases the chances that he will be continuously hunted by that predator.

But cooperation even extends across species as is shown in cleaner fish, which are fish that eat dead skin and parasites off other fish. Even after the cleaning is done, the host fish does not eat the cleaners, so in this case the host is giving up food in order to remove the future danger that could be done by parasites.

Examples like these suggest that some moral values evolved due to the survival benefits they provided. And it isn't much of a stretch to see that cooperative behaviors like those of the vampire bats could be seen as a precursor to the golden rule. If humans were already performing cooperative behaviors, then it would only be a matter of time

before someone observed this and put into words that it was good to help others because they will then help you in return. And this can then be reworded to sound less selfish and more generalized into *do unto others as you would have them do unto you* and just about every religion includes a version of this statement.

And the reason that cooperative behavior and the morality associated with it now extends to everyone and not just people we have a relationship with is because cooperative behaviors evolved at previous times when we lived in small communities where there was no need to differentiate between people in our community that we had a relationship with and those we didn't since we had a relationship with everyone.

So, if morality is an evolved trait, it should have a universal component and there seems to be evidence of this in moral intuition. People experience a feeling that they can intuit what is right and wrong behavior and it seems that they rely more heavily on this intuition than on what others tell them. In fact, it is clear that people do not blindly accept the moral commandments of their religion and use their own intuition to distinguish what is right from wrong. For instance, the Christian Bible implies—even in the New Testament—that slavery is just, because it has many verses regulating the use of slavery and none forbidding it; but people's opinions differ so strongly on this issue that it caused a civil war in the United States. And it seems that even the opinions of the Catholic Church carry more weight than their scriptures, because they banned slavery in 1888 even though their Bible condones it and they claim to follow the word of the Bible (Noonan 2005).

The Christian Bible was even used to justify slavery prior to the Civil War in the United States and the president of the Confederacy, Jefferson Davis, defended his actions by claiming he was obeying the Christian scriptures (Davis 1861).

So it seems that people often form their own opinions on morality and that religious commandments are merely used to justify these opinions. But this leaves open the question of whether morals are learned or arise from intuition.

Greene et al (2001) performed a study investigating people's moral intuition. The basic method they used was to describe a hypothetical moral dilemma and have people decide what they would do. And they used dilemmas that people don't normally encounter in the world so that it would be their moral intuition which was being tested, not opinions they had previously formed.

One dilemma involves a runaway trolley that is heading for some people stranded on the tracks. On one set of tracks there are five people stranded and on the other there is one person stranded. The trolley is heading for the five people, so the basic dilemma asks whether a person should divert the trolley so that it hits one person instead of five people. Almost everyone decides to divert the trolley.

A similar dilemma adds a twist asking whether a man should be pushed off a footbridge in order to stop a trolley that is heading toward five other people. In this case, people vote the opposite, saying that the one person should not be pushed off the footbridge even if doing so will save five people.

So there has to be a major difference between these two situations since in the first one people decide that one person should die to save five people and in the second one person should not die to save five people. And the difference seems to be in the way the person is killed: in the footbridge dilemma someone would have to actively take the one person's life, while with the trolley diversion, it was just the one person's bad luck

that they happened to be standing in the way when the five people were saved (in a sense the one person is passively killed). But when people are asked why they chose a particular answer, they can't explain the reason.

Greene et al conjectured that the footbridge situation differed because the personal nature of the situation would arouse an emotional response, so they performed the experiment with people answering the moral dilemmas while their brains were being analyzed by means of an fMRI (functional magnetic resonance imaging). They found that three areas, which were known to be linked with emotional processes, became active during dilemmas like the footbridge dilemma. And these areas were not found to be as active during cases like the trolley diversion dilemma. But what they also found was that people who decided that it was permissible to push the man off the footbridge took longer to make that decision, as if they had to decide to go against their emotional response instead of just letting their emotions completely determine their decision.

And in the trolley diversion dilemma, an area of the brain associated with logical reasoning was more active, which suggests that people generally evaluate the two solutions in terms of their merit in this situation.

These results show that our moral intuition is not something learned, but the result of both emotional processes and reasoning processes in the brain. It seems likely that our moral intuition helps us make judgments in situations that we have not encountered before, because even in the dilemmas previously stated if someone thinks about the situation for a while, they might change their mind. And other factors would certainly weigh in, for instance, if you had to make your decisions in front of other people, you might be afraid of what they would think of you or that you could be convicted of a crime for your actions, etc.

So while there is evidence that we have moral intuition, our moral decisions also depend on other factors.

One way that opinions are formed is by being passed on through parent-child relationships. Attachment theory, which is the study of long-term relationships like those found in families, has identified several relationship patterns that are found between people, but they generally fall into the categories of secure and insecure. Secure attachments involve a relationship that provides confidence and comfort, which usually allows the freedom for the child to explore. Whereas insecure attachments are characterized by relationships that show an over-dependence on the parent and a general lack of confidence.

A study in Sweden (Granqvist 2002) explored the religiosity of individuals across these two attachment types. They found that individuals who had a secure relationship with their parents tended to have the same views as their parents, which remained relatively stable. In contrast, those with an insecure relationship with their parents did not always share the same views with their parents and often changed their views rapidly.

Experiments have also shown that people's political opinions tend to be similar to that of the community in which they live (Gelman et al 2008), but this might just mean that they move out of communities that don't agree with them. However, in early tribal societies, it usually wasn't possible to leave your community, so there would have been increased pressure to share their opinions, although this wouldn't necessarily *make* everyone's opinions the same.

But it seems that some morals are derived from moral intuition, because there are certain moral rules that seem to be universal. For example, some societies condone killing people from other societies, but no one has found a single society in which killing people from your own society is considered virtuous. The anthropologist Solomon Asch (1952) also observed that, “We do not know of societies in which bravery is despised and cowardice held up to honor, in which generosity is considered a vice and ingratitude a virtue.”

Nevertheless, some societies do not agree on what qualities are vices and virtues. Nietzsche distinguished between two fundamental types of morality which he termed *slave morality* and *master morality* and he asserted that the differences between the two types involved interpretation. He said that “there are no moral phenomena at all, only moral interpretations of phenomena.” So basically he thought that there is no action that is inherently good, but people can interpret the consequences of an action to be good. In this way then, the difference between the two types of morality is that master morality establishes what is good and slave morality values the opposite of what the masters value. This is because for slaves, getting what they want is implausible, so they re-label their inferiorities as virtues. Instead of having no power, they are meek. And anything that the masters see as virtuous, the slaves see as a vice. So while master morality sees qualities such as pride and determination as virtues, slave morality sees the opposite and claims that qualities such as humility and consideration are virtues.

Nietzsche contended that ancient Greek and Roman society were examples of societies with master morality and that the reason the Old Testament promotes slave morality is because the ancient Hebrews originated their moral values while they were enslaved.

And we can see from Homer’s *Iliad* that there are definite differences in the moral values that the Greeks had as compared to those found in the Old Testament. So, while we saw that some morals seem to be universal, others seem to depend on the society. But the concept of slave and master morality also suggests that different opinions about morality arise from deliberation, because the slaves re-labeled their inferiorities as virtues, which means they were not obeying any kind of intuition.

So while the study of the origins of morality is not comprehensive at this point, the current evidence that we investigated suggests that humans have a moral intuition which helps make initial judgments, but that our concrete opinions about morality have been derived through deliberation. And it seems apparent that the reason we have moral values is not *because of* religion but *for the same reason* that religions do.

## **A Further Note**

We saw at the beginning of the previous section that not all religions articulate moral values, but we also know that some do. This is most likely due to the differences in community size. When societies grew from small bands of less than one hundred people to tribes and chiefdoms of thousands of people, people could no longer be close friends or kindred with everyone. And people that are unknown are unpredictable, so religions most likely had to adapt to this change by making rules to increase the predictability of other people's behavior.

It's analogous to playing pickup games of some sport with close friends and with strangers: your friends usually won't try to cheat or be rough, but with strangers you don't know if they will try to trip you, elbow you, etc, so you have to tell them what they can and can't do and agree on a set of rules.

It makes sense to assume that the rules of morality would follow this same principle. So from this idea we can make the prediction that religions of small bands will most likely not have morality incorporated into their religion, but all large communities will have a religion with rules of morality.

## Chapter Nine

### The Origins of Life

Evolution explains how living organisms become diversified and has a firm foundation. Although some have desperately sought flaws in the theory, there is not a single organ known to science that could not have been formed by small successive steps, which means that no flaws have been found in the theory of evolution. In fact, so much of science depends on evolution that to find a flaw would be like seeing someone spontaneously float off the earth. But evolution involves life after it originated, so in order to account for the entire diversity of living organisms, we need another theory that explains how life originated.

There are currently several models of the beginnings of life, but no consensus. However, we can see from the following experiments that the possibility of finding a solid theory that explains how life can naturally originate from inorganic matter is quite likely.

All living things are compounds of proteins and proteins are combinations of amino acids. After water, proteins are the largest constituent of weight in the body. Structures such as nails, hair, muscle, ligaments, tendons, and our organs, glands, and most body fluids are made up of protein as are enzymes, hormones, and DNA.

Amino acids are sometimes referred to as “the building blocks of life” because they are so essential to everything living. The four elements carbon (C), hydrogen (H), nitrogen (N), and oxygen (O) are the main constituents in amino acids. So several scientists designed experiments to see if amino acids could be produced by simulating natural processes. Stanley Miller (1953) was one of the first scientists to test this process, using a mixture of what his teacher Harold Urey thought resembled the primordial oceans and atmosphere of the earth, which consisted of water (H<sub>2</sub>O), methane (CH<sub>4</sub>), ammonia (NH<sub>3</sub>), and hydrogen (H<sub>2</sub>), which as can be seen contain the four main elements of amino acids.

The basic method of the experiment involved sealing the mixture in a flask that was connected to another flask of water by glass tubes and also running electrodes through a flask. The electrodes were used to simulate lightning and the flask of water was heated so that it would evaporate and fill the air with water vapor so that the air in the flasks better matched what they thought the early atmosphere of the earth was like. After one week of heating and cooling the water and sending electricity through the flask,

there was a black residue at the bottom of the flask, which when tested was found to contain the 20 common amino acids along with some sugars and liquids.

Current evidence suggests that the mixture that Urey proposed as resembling the primordial oceans and atmosphere of the earth is not quite accurate, because it is now thought that the early atmosphere would have had nitrogen (N<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S), and sulfur dioxide (SO<sub>2</sub>) from volcanic eruptions that happened 4 billion years ago (Wiechert 2002 & Pidwirny 2006), along with hydrogen and water vapor (Tien 2005).

However, Bada (Fox 2007), performed an experiment similar to Miller's which included nitrogen and carbon dioxide in the mixture instead of ammonia and methane. He also added iron and some other carbonate minerals (which would have been present on earth in its primordial stage) because he knew that nitrites (which are formed from nitrogen and carbon dioxide) destroy amino acids, so the iron and minerals would neutralize this effect. And his experiment produced many amino acids, which shows that amino acids can be produced by simulating natural processes.

A meteorite has also been found that contained over 100 amino acids and other organic compounds, which were not the result of terrestrial contamination (Kvenvolden 1970). So, from the results of the experiments and the studies on the meteorite it seems evident that amino acids readily form when the conditions are right.

From there, though, it's not exactly certain how amino acids form self-replicating molecules, but it is thought that self-replicating molecules came into existence around 4 billion years ago, which would be half a billion years before the existence of the *last universal common ancestor of all life* (Doolittle & Worm 2000).

It has also been suggested by recent studies (Brooks et al 2002) that the original genetic code that would have been found in the *last universal common ancestor* would have consisted of a less diverse number of amino acids and mostly of the kind that abound in a prebiotic environment—like the amino acids produced by Miller's and Bada's experiments.

So, this evidence seems to suggest that, although the science of the origin of life is incomplete at this time, there is no reason to think that life would require anything other than natural means in order to originate.

## Chapter Ten

### In Conclusion

General relativity can predict the state of the universe for almost all of time. The period of time in which it can no longer make calculations is called the *Planck time*, which is  $6.4 \times 10^{-44}$  seconds, so the theory cannot predict what would happen in that infinitesimally short period at the beginning of the universe.

However, this doesn't necessarily mean that the origination of the universe requires supernatural intervention, because it could just be the case that no one has yet discovered the scientific model that governs the origination of the universe.

And, so far, no one has discovered a physical phenomenon that requires a supernatural explanation, which means it's more sensible to conjecture (but this doesn't mean believe) that, given enough time, science will eventually explain all observable phenomena, than to claim that our current gaps in knowledge show that a supernatural being must exist.

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