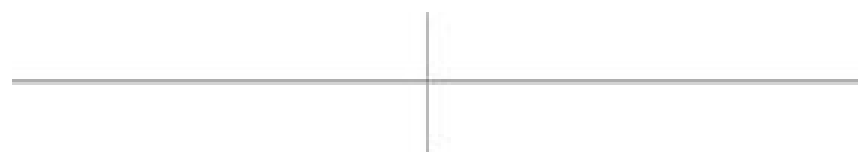


THE FAITH INSTINCT

How Religion Evolved and Why It Endures



NICHOLAS WADE

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THE NATURE OF RELIGION

Religion is not a popular error; it is a great instinctive truth, sensed by the people and expressed by the people.

ERNEST RENAN

To call religion instinctive is not to suppose any particular part of its mythos is untrue, only that its sources run deeper than ordinary habit and are in fact hereditary, urged into birth through biases in mental development encoded in the genes.

EDWARD O. WILSON'

For the last 50,000 years, and probably for much longer, people have practiced religion. With dances and chants and sacred words, they have ritually marked the cycles of the seasons and the passages of life, from birth to adolescence, to marriage and to death.

Religion has brought meaning to millions in their personal lives. Its rituals have given believers an assurance of control over unpredictable adversities. In the face of daunting fears, of famine, sickness, disaster or death, religion has always been a wellspring of hope. "Though thou art worshipped by the names divine Of Jesus and Jehovah," wrote the poet William Blake, "Thou art still The son of morn / weary night's decline, / The lost traveler's dream under the hill."

Religions point to the realm of the supernatural, assuring people that they are not alone in the world. Most religions teach that there is an afterlife and some promise a better existence there, often for lives lived correctly in this world or to compensate for its misfortunes. The Wana people of Sulawesi believe that as they are last on earth, so they will be first in paradise.

Faith brings personal rewards but it is as a social force that religion carves its place in history. In religion's name, people have fed the hungry, cared for the sick, founded charities and hospitals. Religion creates circles of trust whose members may support one another in calamity or find hosts and trading partners in distant cities. In societies throughout the world, religious rites are intimately associated with the communal activities of music and dance. Religion has fostered and inspired artists' expressions of shared devotion, from medieval cathedrals, to the painters of the Renaissance and the masses of Palestrina, Bach and Haydn.

Religion, above all, embodies the moral rules that members of a community observe toward one another. It thus sustains the quality of the social fabric, and did so alone in early societies that had not developed civil authorities. It binds people together for collective action, through public rituals that evoke emotional commitment to a common cause.

There is no church of oneself. A church is a community, a special group of people who share the same beliefs. ~~And these are not ordinary, matter-of-fact views but deeply held emotional attachments.~~ By expressing the common creed together, in symbolic rituals, in group activities involving song and movement in unison, people signal to each other their commitment to the shared beliefs that bind them together as a community. This emotional bonding is captured in the probable derivation of “religion” from *religare*, a Latin word meaning to bind.

Religion may tie together the members of a village church, or of an entire country. It can unite people who may share neither common kinship, nor ethnicity nor even language. When nations feel their existence is at stake, they often define their cause by religion, whether in Europe’s long wars with Islam, or Elizabethan England’s defiance of Catholic Spain, or the Puritans’ emigration to New England, or the foundation of Israel.

So indelibly and distinctively does religion shape the fabric of societies that it has become the defining feature of the cultures around which great civilizations are built, such as those of Western Christianity or Islam or Hinduism.

Religion has a darker side too, drawn from excesses of the fierce loyalty it inspires. Acts of particular cruelty have been committed against internal foes, the perceived disrupters of orthodox belief. Under religion’s banner, societies have conducted inquisitions, murdered people deemed to be heretics or witches, and tortured or exiled those who worshipped different gods.

Religion is almost always prominent in a society’s response to external foes. It has routinely been invoked to justify and sustain wars, and has helped foment many, between Christian and Muslim, Protestant and Catholic, Shi’a and Sunni. Few religious wars have been more atrocious than the Aztec empire’s ravenous search for victims who were sacrificed every day, sometimes by the thousands in a single ceremony, so that the streams of their blood could nourish the Aztec sun god.

What is religion, that it can evoke the noblest and most sublime of human behaviors, yet also the cruelest and most despicable? Is religion just a body of sacred knowledge bequeathed from one generation to the next? Or does religion, being much more than just a cultural heritage, spring from a deeply ingrained urge to worship?

“Like any other human activity,” writes the historian of religion Karen Armstrong, “religion can be abused, but it seems to have been something that we have always done. It was not tacked on to our primordially secular nature by manipulative kings and priests but was natural to humanity.”¹²

Religion is so natural to humanity that it seems to be part of human nature, as if a propensity for belief in the supernatural were genetically engraved in the human mind, and expressed spontaneously as the ability to appreciate music or to learn one’s native language. “No society known to anthropology or history is devoid of what reasonable observers would agree is religion, even those such as the former Soviet Union which have made deliberate attempts to extirpate it,” wrote the anthropologist Roy Rappaport.³

Given the time, energy and treasure spent on building religious monuments, fighting holy wars and offering sacrifices to the gods, Rappaport wrote, he found it hard to imagine that religion had not contributed positively to human adaptation, the process of genetic change that occurs in response to natural selection. “Surely so expensive an enterprise would have been defeated by selective pressure if it were merely frivolous or illusory.... Religion has not merely been important but crucial to human adaptation,” he wrote in 1971.⁴

But Rappaport’s insight was not followed up for many years, in part because of a reluctance by anthropologists to believe that any part of human behavior might be genetically shaped.

The Nature of Religion

The emergence of religious behavior has long been hard to reconstruct because of the severe lack of evidence. The people of 50,000 years ago, the period when modern humans dispersed from the African homeland, have vanished, leaving behind no material trace of their existence, let alone of their religious beliefs. People at that time lived as hunters and gatherers, and continued to do so until about 15,000 years ago. Only then were the first permanent settlements built, by which time religion had long been an established feature of human societies.

But many new strands of evidence have been accumulating. These now make it possible at least to sketch out a possible origin for this most mysterious of human behaviors, as well as a rough time line for its development. Recent work by students of human evolution has provided the context in which a new form of social coordination would have been needed, a requirement that religion would have filled well. By analyzing the DNA of living people around the world, it is possible to identify societies that have long been isolated from others and whose religious behaviors may reflect those of the ancestral human population. New interpretations by archaeologists record how this early form of religious behavior, practiced by hunters and gatherers, was modified for the more sophisticated needs of settled societies.

Thus from a growing body of work by researchers in several different fields, it is now possible to piece together a reasonable account of how and why religious behavior evolved to be an ingrained part of human nature, and to trace some of the cultural innovations by which the early religion of hunters and gatherers was shaped to the different needs of settled societies.

The purpose of this book is to try to understand religious behavior from an evolutionary perspective. Some of the implications that emerge from this approach may be unwelcome to believers and others to atheists. People of faith may not warm to the view that the mind's receptivity to religion has been shaped by evolution. Those who regard religion as an obscurantist obstacle to rational progress may not embrace the idea that religious behavior evolved because it conferred essential benefits on ancient societies and their successors.

Despite these understandable attitudes, the evolutionary approach to religion does not necessarily threaten the central positions of either believers or atheists. Believers would be right to take the view that Darwin's theory specifies no purpose for the biological process it explains and cannot trespass into whatever religions have to say about the meaning of life. Evolution describes how the human body and behavior have been shaped, but has nothing to say about any ultimate purpose behind the process. Biological drives for all functions essential to survival are embedded in the human brain; there need surely be no scandal to people of faith that an instinct for religious behavior is one of those necessities. That the mind has been prepared by evolution to believe in gods neither proves nor disproves their existence.

Atheists, for their part, may not at all welcome the idea that religious behavior strengthens the moral fabric, enhances social cohesion and was so central to the survival of early human societies that all that lacked it have perished. But even that perspective does not compel them to acknowledge the hand of a deity in shaping human values. Religious behavior can be studied for its own sake, regardless of whether or not a deity exists.

THE THEME OF THE pages ahead is that an instinct for religious behavior is indeed an evolved part of human nature. Because of the decided survival advantage conferred on people who practiced religion, the behavior had become written into our neural circuitry by at least 50,000 years ago, and probably much earlier.

To see why religion is likely to be an evolved behavior, it helps to compare it with language. Like language, religion is a complex cultural behavior built on top of a genetically shaped learning machinery. People are born with innate instincts for learning the language and the religion of the community. But in both cases culture supplies the content of what is learned. That is why languages and religions differ so widely from one society to the next, while remaining so similar in their basic form.

Just as language operates on top of many other behaviors that had evolved earlier, such as neural systems for hearing and generating sounds, religious behavior too depends on several other sophisticated faculties, such as sensitivity to music, the moral instinct and of course language itself. Like language, religious behavior in all societies develops at a specific age, as if an innate learning program is being triggered on cue.

As with language, religion is most significant as a social behavior. One can speak or pray to oneself, but both are most meaningful when done in company. That is because both faculties are instruments of communication.

Many human behaviors are shared with other animals, especially our fellow mammals, leaving little room for doubt that traits like a mother's urge to protect her children have a strong genetic basis. And it is easy to envisage that mothers who watch closely over their young will leave more surviving offspring than will less vigilant mothers. So over the course of a few generations genes that promote protective instincts will displace genes allowing maternal indifference, and the upshot will be the development of a strong instinct for maternal care.

The same argument applies to the development of language and religion, though is less demonstrably true because they are uniquely human behaviors and there are no other species in which these faculties can be directly studied. Still, it has long seemed likely on grounds of general plausibility that language has a genetic basis. The rules of sentence formation are so complex that babies must presumably possess an innate syntax-generating machinery, rather than having to figure out the rules for themselves. The existence of such a neural mechanism would explain why infants learn to speak so effortlessly, and at a specific age, as if some neural developmental program is being rolled out at that time. Evolution has not yet had time to engineer similar programs for reading and writing, which is why they must be taught so laboriously in school.

Arguments about the innateness or otherwise of language have been hard to resolve because so little is known about the genes that define the architecture of the human brain. But with recent advances in decoding the human genome, the first genes affecting language have started to come to light, beginning with the discovery in 2001 of the FOXP2 gene which affects several neural and muscular skills underlying the articulation of speech.

People survive as social groups, not as individuals, and little is more critical to a social species than its members' ability to communicate with one another. Because of the primacy of language and the effectiveness of the other modes of communication, such as religion or gesture, often go unappreciated. Just as language is a system for communicating thought, religious behavior is a way of signaling shared values and emotions. Any genetic variation that made these systems more effective is likely to have been quickly favored by natural selection. This is particularly true if natural selection operates on groups of individuals as well as at the level of individuals alone, as is more usual. Group

level selection is controversial among evolutionary biologists, but even its sternest opponents do not say that it cannot exist, only that it is likely to be insignificant in most cases. There are special circumstances in human evolution, discussed below, that would have allowed group selection to operate much more powerfully than usual.

It's easy enough to see why natural selection would have favored genes underlying the faculty of language, given the immense advantage to members of a social species of being able to share thoughts and information. But why should religious behavior have evolved? What benefit does religion confer other than spiritual fulfillment? How can religious behavior make a difference on the only scale measured by natural selection, that of leaving more progeny?

To understand the influence exerted by religion in early societies, it helps to distinguish between its personal aspects, which are probably more familiar to people today, and its role as a social force.

The Social and Personal Nature of Religious Belief

Asked to define religion, many people will describe the personal importance of their belief, whether as a feeling of communion with the sacred, a source of hope and solace, a compass of moral behavior, an explanation of misfortune, or a wellspring of meaning in life. In his book *The Varieties of Religious Experience*, the psychologist William James emphasized the personal above any other element of religion. Religion, as he defined it, “shall mean for us the feelings, acts, and experiences of individual men in their solitude, so far as they apprehend themselves to stand in relation to whatever they may consider the divine. Since the relation may be either moral, physical, or ritual, it is evident that outside religion in the sense in which we take it, theologies, philosophies, and ecclesiastical organizations may secondarily grow.”⁵

But however strongly religion may seem to grow out of people's personal beliefs, the practice of religion is heavily social. It is because of their personal beliefs that people desire to worship together with others of the same faith. People may pray alone, but religious services and rituals are communal. A religion belongs to a community and shapes members' social behavior, both toward one another (the in-group) and toward non-believers (the out-group). The social aspect of religion is extraordinarily significant because the rules for behavior toward others are in effect a society's morality.

One need look no further for a reason why people are so attached to their religion. The quality of a society—its cohesiveness, its freedom from crime, its members' willingness to help others, the rarity of lying, cheating and freeloading—is shaped by the nature of its morality and by the strength of people's adherence to community standards. Both of these—standards of morality, and the extent of compliance with them—are set or heavily influenced by religion. People will defend their religion because it undergirds so much else of what gives life quality.

Those standards of morality underwritten by religion have a curious feature about them, one that is not generally acknowledged by moral philosophers who see morality as being based on universal principles. Practical morality is not universal. Compassion and forgiveness are the behaviors owed to one's in-group, but not necessarily to an out-group, and certainly not to an enemy.

Toward hostile societies human behavior is steely, implacable and often genocidal. Foes may be demonized or regarded as subhuman, and the moral restraints owed to members of one's own society

need not be extended to them. And religion is often intimately involved in warfare because it invoked by leaders to justify aggression, to sustain morale, and to spur soldiers to the ultimate sacrifice.

From this perspective, one can begin to see how crucial religion may have been over the centuries in ensuring a society's survival. It enhances the quality of a society and makes it worth fighting for and it inspires people to lay down their lives in the society's defense. Other things being equal, groups with a stronger religious inclination would have been more united and at a considerable advantage compared with groups that were less cohesive. People in the more successful groups would have left more surviving children, and genes favoring an instinct for religious behavior would have become commoner each generation until they had swept through the entire human population.

The social function of religion, as opposed to the personal, is the one that seemed significant to Émile Durkheim, a founder of sociology. Durkheim saw religion as playing a mediating role between people and the society in which they live. "The faithful are not mistaken when they believe in the existence of a moral power to which they are subject and from which they receive what is best for themselves. That power exists, and it is society," Durkheim wrote in his book *The Elementary Forms of Religious Life*, first published in 1912. He went on to note that "religion is first and foremost a system of ideas by means of which individuals imagine the society of which they are members and the obscure yet intimate relations they have with it."⁶

People do not of course worship society directly. Durkheim's insight was that the relationship between religion and society could be seen to work in two directions, at least in terms of the social functions. Religion imbues a society with moral standards and belief in a supernatural enforcer behind them; society embraces religion and follows its dictates, while shaping them toward solving current problems. Religion is far more than belief in supernatural powers, in Durkheim's view. Magicians and sorcerers, after all, summon unearthly forces to do their bidding, but they do not draw people to one another—there is no church of magic. Religious beliefs, on the other hand, are shared, and bind together all those who hold them.

This line of thought led Durkheim to his well-known definition: "A religion is a unified system of beliefs and practices relative to sacred things, that is to say, things set apart and forbidden—beliefs and practices which unite into one single moral community called a Church all those who adhere to them."⁷ In showing that religion and church are inseparable, Durkheim added, the definition underlines that religion "must be an eminently collective thing."

For those familiar with thinking of religion in personal terms, it may seem strange to conceive of religion as an agent of society's collective will, in addition to whatever else it may be. But consider how intimately religion is involved in important social functions, such as the rite of marriage. In the Anglican branch of Christianity, toward the conclusion of the service, the priest joins together the right hands of the man and woman, and issues the solemn warning, "Those whom God hath joined together, let no man put asunder."

These are powerful words because at that moment, in their own eyes and in those of society, the man and woman indeed become married, and their union is spiritually indissoluble. The arrangement is one that all in the community recognize, whether they were present or not. "There are hardly any words in the Prayer Book which more solemnly declare the faithful conviction of the Church that God ratifies the work of His priests," writes John Henry Blunt, author of *The Annotated Book of Common Prayer*.⁸ And of course society too, through the priest's words and the communal service, ratifies the marriage.

There may be a civil procedure as well, but it does not carry the same weight. It is the religious ceremony that evokes the emotional conviction that two people have been truly married.

In the initiation rites observed by many peoples, which commonly occur as part of a religious ceremony, a boy becomes a man, not just metaphorically but because his community thereafter treats him like a man. In coronation rites, whether by anointment or the placement of a crown or diadem on his head, a man becomes a king. Religions are powerful creators of social fact. And it's not merely facts they create, but a binding emotional knowledge that these facts are sacred truths.

It's easy to underestimate the remarkable nature of the effect achieved by religious belief, just as it is easy to underestimate language, since we take both faculties for granted. Language lets people convey precise thoughts from the mind of one individual to that of another, an extraordinary feat of biological engineering achieved by no other living species. Equally unparalleled, religion binds a group of individuals together in beliefs and principles they consider so sacred and inviolable that they feel compelled to submit their usually lively sense of self-interest to that of the group. Just as language achieves almost perfect communication, religion brings about an emotional commitment so powerful that people will make almost any sacrifice that their religion requires, including that of their life.

Durkheim's work strongly influenced social anthropologists such as Bronislaw Malinowski and Alfred Radcliffe-Brown, both of whom reached much the same conclusions. "Religion needs the community as a whole so that its members may worship in common its sacred things and its divinities," Malinowski wrote, "and society needs religion for the maintenance of moral law and order."⁹

Durkheim's views on religion later fell out of favor with social scientists for several reasons, including reinterpretation of the early ethnographic data about Australian Aborigines, on which Durkheim's theory was largely based. But his ideas have recently become an inspiration to biologists seeking to understand the role of religion in early human evolution. The reason is that they point strongly to the survival value of religious behavior. A society that develops a strong moral fabric whose members are emotionally committed through powerful rituals to their community's well-being is likely to prevail in warfare over a society with weaker bonds. Groups that used religion to coordinate collective activities, such as planting fields at the right time or managing natural resources, would have been more effective and better able to survive.

Natural selection, a motive force of evolution, is about survival and who leaves more children. Many of the social aspects of religious behavior offer advantages—such as a group's strong internal cohesion and high morale in warfare—that would lead to a society's members having more surviving children, and religion for such reasons would be favored by natural selection. This is less true of the personal aspects of religion. Religion may help people overcome the fear of death, or find courage facing disease and catastrophe, but these personal beliefs seem unlikely to enable them to have more surviving offspring, natural selection's only yardstick of success. Rather, the personal rewards of religion are significant because they draw people to practice it, without which the social benefits could not have been favored by natural selection.

Defining Religion

What then is religion? The word itself has a range of meanings, referring sometimes to a set of beliefs in the supernatural, sometimes to an organized community of adherents to a faith. Religion has been notoriously hard to define, perhaps because each observer seeks to emphasize a different aspect. Even the great sociologist Max Weber ducked the task. He opened his essay on the sociology of religion by warning readers they must wait to hear exactly what it is—"Definition can be attempted, if at all, only at the conclusion of the study"—yet he provided none at the end either.

But if, as argued here, religious behavior emerged because of its evolutionary role, definition becomes less elusive. From the evolutionary perspective, as laid out in the chapters ahead, the essential elements of religious behavior may be summarized as follows. Starting around the age of adolescence, people learn and become emotionally committed to the rituals, religious practices and sacred symbols of their community. The rituals involve rhythmic activity, whether singing and vigorous dancing, as in hunter gatherer religions, or just singing, as in many modern religions. They may include painful initiation rites that induce lasting emotional memories and commitment. The rituals evoke a sense of awe as celebrants feel that they or their priests are in contact with agents of the supernatural realm.

Through moving or singing in unison, in a state of emotional elevation, individuals develop a fervent sense of togetherness, a desire to put the group's interests above their own and to do whatever is needed, up to the sacrifice of their own life, in the group's defense.

In practicing their religion, people come to know what is right for themselves and their community; it is what the supernatural powers have decreed.

In every religion, the supernatural powers live in a different realm and yet, strange as this may be, they are not unreachable. Their behavior can be influenced by appropriate rituals, prayers and sacrifice. A religious community thus implicitly negotiates with its supernatural lawgivers. The negotiators who interact with the gods are the whole community in the case of primitive societies, the ecclesiastical hierarchy in larger ones. Through reference to precedent (the wisdom of the ancestors) and discussion among themselves, the negotiators implicitly decide on the behaviors they want the society to follow and they then seek the gods' endorsement of their ideas. The gods set the rules and courses of action that are indicated to them, along with rewards or punishments for compliance and disobedience. The divine requirements habitually include common standards of morality within the group, and readiness to unite in response to external challenges such as aggression from other societies.

Communities would not gain the social benefits of religious behavior unless people had strong personal motivations to participate. And indeed religion is attractive because it does bring many deep personal satisfactions. It is the source of some of the deepest emotions of which people are capable, such as feelings of awe, of exaltation, of transcendence, of rightness and harmony with the world. Religion gives people hope in adversity, because the faithful believe that through prayer and ritual they can exert some measure of control over unpredictable disasters like disease or bad weather.

The personal aspects of religious behavior, however, are not all rewards. There is fear of punishment, too, the knowledge that retributive deities are watching for infractions of their rules and will deliver harsh penalties in this world or the next, perhaps for even contemplating a forbidden act. Fear of an omnipresent supervisor is of utmost practical benefit to a group, particularly in primitive societies that lack courts and police forces. Fear of divine retribution keeps almost everyone in line with the prevailing rules and moral code; and these laws, though always attributed to supernatural decree, as recorded by previous generations in sacred sayings or texts, can in fact be shaped by the society.

From an evolutionary perspective, therefore, the following definition emerges: Religion is a system of emotionally binding beliefs and practices in which a society implicitly negotiates through prayer and sacrifice with supernatural agents, securing from them commands that compel members, through fear of divine punishment, to subordinate their interests to the common good.

Cultural Development of Religion

The religion that evolved among hunter gatherers tied a clever knot. It enabled a society to impute to the gods its collective wisdom as to how members should behave so as best to ensure the society's survival; and through initiation rites and communal dancing it induced in everyone the emotional commitment to obey the gods' rules and fear their sanctions. Without a police force or prison guard or judiciary, in any case impossible for hunter gatherers, early societies achieved through religion both social cohesion and effective compliance with the dictates of an invisible government.

Once religion had evolved among early people, it underwent a long and extensive cultural development into the very different forms of religion that are familiar today. The nature of this development, as is laid out in the chapters ahead, can now for the first time be reconstructed, even if only in outline.

The initial step is to infer the general form of early religion from the rites of contemporary hunting and gathering societies whose way of life has not changed for millennia. The appropriate societies can be chosen by genetic criteria that point to their relative degree of isolation. Next, with the help of archaeology, it is now possible to trace the steps by which early religion developed into the forms found in settled societies. Hunter gatherer religions involved the whole community as equal participants in interaction with the gods. In settled societies, a class of priestly officials emerged between the people and their gods. Religious power became more exclusive and began to serve as a pillar of archaic states, which were often ruled by a priest-king. The cohesive power of religion also began to be applied to other tasks requiring collective action, such as the unaccustomed hard labor required by societies first taking up agriculture. The principal rites of these religions were tied to the farming calendar, and these ceremonies were co-opted by the more sophisticated religions that arose in advanced states.

From one of these states, that of the Canaanites and their Israelite descendants who lived in the Near East in the second millennium B.C., the first great monotheism emerged. Scholars can now reconstruct in reasonable detail the historical context in which Judaism was shaped and some of the motivations of its shapers.

As for the second great monotheism, the origins of Christianity are still shrouded in considerable mystery. The religion first flourished among the Greek-speaking Jews dispersed through the cities of the Roman empire. Though the roots of Christianity are Jewish, all its earliest documents and liturgies are in Greek, and in its new linguistic home the religion adopted its distinctively non-Jewish themes. Christianity was so successful that within just over 300 years it had become the state religion of the Roman empire.

Islam, by contrast, did not climb to an imperial role but was born into it. The third great monotheism burst into history as the official sect of the Arab state that inherited the Byzantine empire's holdings in the Near East. Scholars, both Muslim and non-Muslim, have for years assumed

that the truth about the origins of Islam can be found somewhere within the rich field of Islamic writings. Only recently has a small band of researchers developed a new premise, that Islamic writings should be regarded primarily as sacred literature, not as history. These revisionists are in the process of constructing an alternative and somewhat surprising history of Islam. Their account has not yet received the attention or the testing it may merit but would, if supported, provide another instance of how the cohesive power of religion can be skillfully adapted to political ends.

These cohesive powers are evident in most collective activities of ancient societies and remain surprisingly visible in modern societies, despite the profusion of secular institutions that have taken over many of religion's former roles. In marriage and reproductive practices, in enforcing standards of morality, in political movements, in generating the bonds of trust essential for commerce, and in warfare, religion continues to play many of its ancient roles as effectively as ever.

THE COMPLEXITY OF RELIGION—its intricate role in human history, the strong mix of emotion it raises in participants' hearts—all seem to some degree explicable in terms of the forces that shaped the emergence of religious behavior during the dawn of human evolution. It is these shaping forces that must now be explored. But before examining religious behavior itself, it is pertinent to consider an essential human faculty that is a pillar of religion, though also separable from it, and that is the moral instinct. At the social level, religion has long been seen as essential to morality and probably still is. For even though individuals can behave morally without religion, most atheists and agnostics take good care to observe the moral standards of their community, which even in highly secular countries are influenced by religion.

Religion and morality share a common feature that reflects their origins as evolved behaviors: both are rooted in the emotions. Religious knowledge is not like knowing the day of the week; it is something a person feels and is deeply committed to. Moral intuitions usually appear in the mind as strong convictions, not as neutral facts. Religious and moral beliefs can be discussed in a rational way but both have emotion-laden components that are shaped in regions of the brain to which the conscious mind does not have access. Natural selection has tagged them with a compelling quality which mere facts are free.

Morality is older than religion—its roots can be seen in monkeys and apes—and religious behavior was engrafted on top of it in the human lineage alone. Understanding how the moral instincts evolved makes it easier to see that religious behavior too has an evolutionary origin.

THE MORAL INSTINCT

Man was destined for society. His morality, therefore, was to be formed to this object. He was endowed with a sense of right & wrong merely relative to this. This sense is as much a part of his nature, as the sense of hearing, seeing, feeling. . . . State a moral case to a ploughman & a professor. The former will decide it as well, & often better than the latter, because he has not been led astray by artificial rules.

THOMAS JEFFERSON¹⁰

Everyone knows the difference between right and wrong. But where does that sure knowledge come from? From reason, as some philosophers have taught? Or from divine revelation, as theologians say?

In the last few years a startling new idea has been introduced to the age-old debate about the nature of morality. Biologists have come to realize that social animals, in interacting with other members of their community, have developed rules for restraining their self-interest. It is these rules of self-restraint, which are likely to have a genetic basis, that make up the social fabric of a baboon troop or a band of chimpanzees.

No one is imputing morality to animals, but observers have found that monkeys and apes show many behaviors, such as empathy and a sense of reciprocity, that could be building blocks of the moral sense that is so evident in people. Humans would have inherited these building blocks from their apelike ancestors and developed them into moral instincts.

Biologists thus began to see that they might be able to construct a new explanation of morality. Moral behavior does not originate from outside the human mind or even from conscious reasoning, the sources favored by theologians and philosophers, but rather has been wired into the genetic circuitry of the mind by evolution.

The clearest statement of the new program came from the distinguished biologist Edward O. Wilson. “The time has come,” he wrote in his book *Sociobiology*, “for ethics to be removed temporarily from the hands of the philosophers and biologicized.”¹¹ A few years later he confidently predicted that “Science for its part will test relentlessly every assumption about the human condition and in time uncover the bedrock of the moral and religious sentiments.”¹²

Both philosophers and psychologists took some time to respond to Wilson’s challenge, but a highly interesting investigation is now being undertaken by both groups, working partly in collaboration.

The new view of morality, that it is at least partly shaped by evolution, has not been arrived at easily. Philosophers long focused on reason as the basis of morality. David Hume, the eighteenth-century Scottish philosopher, defied this tradition in arguing strongly that morals spring not from conscious reasoning but from the emotions. “Morals excite passions, and produce or prevent actions. Reason of itself is utterly impotent in this particular. The rules of morality, therefore, are not

conclusions of our reason,” Hume wrote in his *Treatise on Human Nature*.

But Hume’s suggestion only made philosophers keener to found morality in reason. The German philosopher Immanuel Kant sought to base morality outside of nature, in a world of pure reason and moral imperatives that met the test of being fit to be universal laws. This proposal, Wilson wrote acidly, made no sense at all: “Sometimes a concept is baffling not because it is profound but because it is wrong. This idea does not accord, we know now, with the evidence of how the brain works.”¹³

Psychologists too, however, were long committed to the philosophers’ program of deriving morality exclusively from reason. The Swiss psychologist Jean Piaget, following Kant’s ideas, argued that children learned ideas about morality as they passed through various stages of mental development. Lawrence Kohlberg, an American psychologist, built on Piaget’s ideas, arguing that children went through six stages of moral reasoning. But his analysis was based on interviewing children and having them describe their moral reasoning, so reason was all he could perceive.

Even primatologists, who would eventually contribute to the new view of morality, were muzzled because animal behaviorists, under the baleful influence of the psychologist B. F. Skinner, accused anyone of anthropomorphism if they attributed emotions like empathy to animals.

With everyone on the wrong track, and Hume’s insight neglected, the study of morality was something of a stalemate. “It is an astonishing circumstance that the study of ethics has advanced so little since the nineteenth century,” Wilson wrote in 1998, dismissing a century’s work.¹⁴

A development that helped break the logjam was an article in 2001 by Jonathan Haidt, a psychologist at the University of Virginia. Haidt had taken an interest in the emotion of disgust and was intrigued by a phenomenon he called moral dumbfounding. He would read people stories about a family that cooked and ate its pet dog after it had been run over, or a woman who cleaned a toilet with the national flag. His subjects were duly disgusted and firmly insisted these actions were wrong. But several were unable to explain why they held this opinion, given that no one in the stories was harmed.

It seemed to Haidt that if people could not explain their moral judgments, then evidently they were not reasoning their way toward them.

The observation prompted him to develop a new perspective on how people make moral decisions. Drawing on his own research and that of others, he argued that people make two kinds of moral decision. One, which he called moral intuition, comes from the unconscious mind and is made instantly. The other, moral reasoning, is a slower, after-the-fact process made by the conscious mind. “Moral judgments appear in consciousness automatically and effortlessly as the result of moral intuitions.... Moral reasoning is an effortful process, engaged in after a moral judgment is made, which a person searches for arguments that will support an already made judgment,” he wrote.¹⁵

The moral reasoning decision, which had received the almost exclusive attention of philosophers and psychologists for centuries, is just a façade, in Haidt’s view, and it is mostly intended to impress others that a person has made the right decision. People don’t in fact know how they make the morally intuitive decisions, because these are formed in the unconscious mind and are inaccessible to them. So when asked why they made a certain decision, they will review a menu of logically possible explanations, choose the one that seems closest to the facts, and argue like a lawyer that that was the reason. This, he points out, is why moral arguments are often so bitter and indecisive. Each party makes lawyerlike rebuttals of the opponent’s arguments in the hope of changing his mind. But since the opponent arrived at his position intuitively, not for his stated reasons, he is of course not persuaded. The hope of changing his mind by reasoning is as futile as trying to make a dog happy by wagging its tail for it.

Haidt then turned to exploring how the moral intuition process works. He argued, based on a range of psychological experiments, that the intuitive process is partly genetic, built in by evolution, and partly shaped by culture.

The genetic component of the process probably shapes specialized neural circuits or modules in the brain. Some of these may prompt universal moral behaviors such as empathy and reciprocity. Others probably predispose people to learn the particular moral values of their society at an appropriate age.

This learning process begins early in life. By the age of two, writes the psychologist Jerome Kagan, children have developed a mental list of prohibited actions. By three, they apply the concepts of good and bad to things and actions, including their own behavior. Between the ages of three and six, they show feelings of guilt at having violated a standard. They also learn to distinguish between absolute standards and mere conventions. "As children grow, they follow a universal sequence of stages in the development of morality," Kagan writes.¹⁶

That children everywhere follow the same sequence of stages suggests that a genetic program is unfolding to guide the learning of morality, including the development of what Haidt calls moral intuition.

Such a program would resemble those known to shape other important brain functions. The brain does much of its maturing after birth, forming connections and refining its neural circuitry when the infant encounters relevant experience from the outside world. Vision is one faculty that matures at a critical age; language is another, and moral intuition is a third.

Damage to a special region of the prefrontal cortex, its ventromedial area located just behind the bridge of the nose, is associated with poor judgment and antisocial behavior. Neural circuitry in the brain's prefrontal cortex is evidently associated with the cultural shaping of moral intuitions.

The existence of special neural circuitry in the brain dedicated to moral decisions is further evidence that morality is an evolved faculty with a genetic basis. In the well-known case of Phineas Gage, a thin iron rod was shot through Gage's frontal lobe in a railroad construction accident in 1848. Gage, astonishingly, survived the accident but his personality was changed. Previously hardworking and responsible, he was now "fitful, irreverent, indulging at times in the grossest profanity (which was not previously his custom), manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires," according to a physician who examined him 20 years later.¹⁷

A more specific damage to moral sensibilities is seen in patients with Huntington's disease. Strangely, they become very utilitarian, making moral judgments by weighing only the consequences and ignoring strong social taboos. Consider a situation where a man's wife has just died. Her body is there on the bed, and he decides to have intercourse with her one last time. Is that OK? Most people will say absolutely not. Huntington's patients see no problem. Their sense of disgust, an emotion that intensifies certain moral judgments, seems strangely relaxed: if shown a piece of chocolate molded in the form of dog turd, most people will lose any appetite for it, but many Huntington's patients will happily wolf it down.¹⁸

There seem to be neural circuitries for morality and for disgust, since specific damage to the brain can cause a loss of either behavior. But these behaviors, though at their core very similar in every society, are heavily shaped by culture. Because of cultural differences, societies may vary widely in terms of the actions they consider morally permissible. In Western societies, for instance, killing an infant is generally regarded as murder. But among the !Kung San, a hunting and gathering people in the Kalahari desert of southern Africa, it is the mother's moral duty to kill after birth any infant that

deformed, and one of each pair of twins.¹⁹ A !Kung mother must carry her infant wherever she goes and does for some 5,000 miles before the child learns to walk. Since she must also carry food, water, and possessions, she cannot carry twins. So the duty to kill a twin, and to avoid investment in a defective child with limited prospects of survival, can be seen not as any moral deficiency on the !Kungs' part but rather as a shaping of human moral intuitions to their particular circumstances.

Standards of sexual morality vary widely, particularly in regions like aboriginal Australia and neighboring Melanesia where conception is not regarded as dependent on the father's sperm and men are therefore less jealous of sexual access to their partners. Thus at *kayasa*, the festival gatherings held by people of the Trobriand Islands off the eastern end of Papua New Guinea, the sportive element of the games was taken somewhat further than is customary in Western countries. "At a tug-of-war *kayasa* in the south," reports the anthropologist Bronislaw Malinowski, "men and women would always be on opposite sides. The winning side would ceremonially deride the vanquished with the typical ululating scream (*katugogova*), and then assail their prostrate opponents, and the sexual act would be carried out in public. On one occasion when I discussed this matter with a mixed crowd from the north and the south, both sides categorically confirmed the correctness of this statement."²⁰ As Rudyard Kipling has occasion to note, "The wildest dreams of Kew are the facts of Khatmandu, And the crimes of Clapham are chaste in Martaban."

But the commonalities in morality are generally more striking than the variations. The fundamental moral principle of "do as you would be done by" is found in all societies, as are prohibitions against murder, theft and incest. Many of these universal moral principles are likely to be shaped by innate neural circuits, while the variations spring from moral learning systems that are more guided by cultural traditions and a society's particular ecological circumstances.

Returning to moral intuition and moral reasoning, the two basic psychological processes that underlie morality, the question arises as to why evolution has so generously equipped us with two processes, when one might seem plenty. The most plausible answer is that the two processes emerged from different stages of human evolution.

Moral intuition is the more ancient system, presumably put in place before humans gained either the power of reasoning or the faculty of language. After the evolution of language, when people needed to explain and justify their actions to others, moral reasoning would have developed. Before evolution would have had no compelling rationale for handing over control of individual behavior to this novel faculty, at the expense of the moral intuition that had safeguarded human societies for so long. So the arrangement that evolved was that both systems were retained. The moral intuitive system continues to work beneath the level of consciousness, delivering its snap judgments to the conscious mind. The moral reasoning system then takes over, working like a lawyer or public relations agent to rationalize the moral input it has been given and to justify an individual's actions to himself and his society.

Moral Intuition and Trolley Problems

Though the moral intuitive system is inaccessible to the conscious mind, some intriguing traces of its presence can be seen in the subtle moral exercises known as trolley problems. First devised by the moral philosopher Philippa Foot, trolley problems have been developed by psychologists interested

probing the invisible moral rules of the intuitive system. The problems are entirely artificial, which avoids real-life complications and purifies the moral decision to be made.

In the typical trolley problem, a trolley or train is barreling down on five people who are rashly walking on the tracks, oblivious to the danger until the last moment and unable to escape because the track runs through an embankment with steep sides. An individual standing between the train and the five people has the power to save them, but only after making a fraught moral decision.

So consider first the case of Denise, who is standing by a switch that can divert the train onto a side-track. However, a hiker is walking on the side-track and he too cannot escape the train. Would Denise be right to pull the switch and divert the train, saving five people but killing one?

Ethicists may debate the correct answer but psychologists are more interested in the practical matter of what answer do most people in fact give. Marc Hauser, a psychologist at Harvard University, posed the question on his Web site. Tallying the results after several thousand people had taken the test, he found 90 percent said it was OK for Denise to pull the switch.

Subjects were next asked to consider Fred's dilemma. Fred is standing on a bridge above the railroad tracks. He can save the five people on the track ahead by throwing a heavy object down in the train's path and slowing it. Just such an object is standing beside him. It's a thick-set man. Can Fred push the man in the train's path, killing him to save the five?

Only 10 percent of the respondents to Hauser's survey thought it was OK for Fred to kill the man.

Then came the interesting question: Why is Denise's action OK but Fred's not, when the practical outcome in both cases is identical—one life lost to save five?

Some 70 percent of the subjects were unable to give any plausible reason for the distinction. "The fact that most people have no idea why they draw a distinction between these cases reinforces the point that people tend to make moral judgments without being aware of the underlying principles," Hauser writes.²¹ He also notes the problem posed by this result for those who think that all morality is taught. For if people cannot articulate the reasons for their moral decisions, how can they teach them?

The beauty of the trolley problems is that they capture moral intuition at work in ways for which the moral reasoning process is unable to invent a plausible explanation. This gives a deep insight into the hidden rules by which the moral intuitive process operates.

Hauser and his colleagues have described three of these rules, which they call the contact principle, the intention principle and the action principle. (Philosophers have described them under other names.)

The contact principle is perhaps the most fascinating because it seems the most primitive. It is simply a taboo on causing bodily harm to anyone. It was presumably engraved in the mind's neural circuits long before the invention of spears or arrows that allowed people to be killed at a distance. The contact principle may also underlie the reason why moral situations before our eyes are more compelling than those at a distance. If we see a child injured by the roadside, we know we must stop and help. But if we see an advertisement soliciting funds to repair a child's harelip in faraway places, it's permissible to turn the page.

The contact principle explains part of the reason why in Fred's moral dilemma, people say it is wrong for him to push the thick-set man onto the tracks to save the five. In Denise's dilemma, her actions led to the death of the hiker on the side-track, but there was no personal contact between her and the person killed.

Another insight into the contact principle is to assume, in Fred's dilemma, that all the people before Fred have been replaced with chimpanzees. Is it OK for Fred to push a fat chimp off the bridge to save five chimps on the track? Most people say it's OK. The taboo of killing a person with one's bare hands

is no longer evoked. Curiously, when subjects were asked why they judged Denise's action OK but not Fred's, several mentioned the fact of physical contact but rejected it as sufficient reason for the distinction. "Subjects were typically able to articulate the relevant principle used, but unwilling to endorse it as morally valid," Hauser writes.²²

Another hidden rule of intuitive morality, the intention principle, can be discerned in Denise's and Fred's dilemmas. Denise foresaw that the hiker on the side-track would be killed, but didn't intend it. The hiker's death was a foreseen consequence but not the desired outcome of her action. Where Fred, if he pushes the thick-set man into the train's path, intends the man's death or, at the very least, must include the likelihood of the man's death in his intended act. The moral intuitive process clearly makes a distinction between intended harm, which is not OK, and merely foreseen harm, which may be justifiable. The complexity of this distinction, which most people cannot articulate, suggests an innate rule at work, one to which the conscious mind has no more access than to the rules that generate grammatical sentences.

A third hidden rule, the action principle, is that harms caused by positive action are deemed worse than those caused by omission, or not acting. Suppose Fred has a lever that drops the thick-set man onto the tracks in front of the train. (The lever arrangement is to avoid triggering the intuitive contact principle.) Then there is Jeff, whose lever does the opposite—it prevents the thick-set man's otherwise inevitable fall onto the tracks. Fred's action in pulling the lever, and Jeff's failure to do so, have precisely the same effect—the thick-set man is killed but the five are saved. Nonetheless, people judge Jeff's omission far more acceptable than Fred's action. In this case, however, most subjects cannot articulate the intuitive principle at work.

The moral intuitive process equips everyone with the neural machinery for making instant moral decisions, without review by the moral reasoning apparatus. It is easy to see how advantageous such a system would have been in days when our ancestors were hunter gatherers and had to make life-or-death decisions in a split second. This instantaneous process is useful in today's societies too. The social fabric is surely stronger if everyone has immediate knowledge of what is right and wrong.

But doesn't the possession of an instantaneous moral decision-making machinery, inaccessible to the conscious mind, make a person into a contemptible robot? Not really; an individual can always ignore the machinery's prompting. Also, the moral intuitive process, as mentioned above, is shaped by culture, meaning the education and moral instruction a person receives in childhood. Religion plays a central role here, as described in the next chapter. So do a child's peers and parents. All these influences are working to shape a set of innate moral behaviors to each society's particular values.

These values are set by tradition and ultimately by the collective behavior required for each society to survive in its particular environment. They may therefore vary from one society to another. Human nature, generally thought of as being the same everywhere, must depend more on the constant features of every society's moral behavior, and therefore on the innate moral behaviors. What are these behaviors and where do they come from?

The Origin of Moral Sentiments

Darwin, in his book *The Descent of Man*, published in 1871, devoted two chapters to the evolution of morality. His arguments were long dismissed by many biologists, but they anticipated much of what

current wisdom today.

Darwin argued that sociality arose as a defense against predators, and that animals that banded together for this purpose would need to moderate their behavior toward one another. "All animals living in a body, which defend themselves or attack their enemies in concert, must indeed be in some degree faithful to one another; and those that follow a leader must be in some degree obedient," Darwin wrote.²³

The social instincts would develop from simple emotions like the parent-child bond, Darwin argued, and any social animal would acquire morality once it had evolved sufficient intellectual powers. He saw no discontinuity between the social instincts in animals and in people but in human societies, he assumed, the instincts would be enhanced by people's desire for the approval of their peers, and the "remorse, repentance, regret or shame" that follows on forfeiting the good opinion of one's peers.

Darwin then raised the problem that an altruistic person who gave his life for his community would leave no children, or at any rate fewer than less heroic people. So how could the inherited character of altruistic behavior ever become more common?

The biologist William Hamilton answered the question a century later, at least for small communities of related individuals. In his theory of kin selection, Hamilton explained that getting your relatives' genes into the next generation was just as advantageous, as far as natural selection was concerned, as passing on your own genes. So since your brother has on average half of the same genes as you do, you could get your genes for altruism into the next generation by saving two brothers' lives just as well as by saving your own.

But Darwin's answer, despite Hamilton's more specific formulation, is still of great interest. First, Darwin wrote that "To do good unto others—to do unto others as ye would they should do unto you—is the foundation-stone of morality." A man who sacrificed his life following this principle would be widely admired and inspire valor in other members of his tribe. "He might thus do far more good to his tribe than by begetting offspring with a tendency to inherit his own high character," Darwin wrote.

The second part of Darwin's answer raised an issue now known as group selection, the idea that genes can become more common if they confer a benefit on groups of people rather than just individuals. Darwin did not know of the existence of genes, so could not have formulated the problem to himself in those specific terms. Nonetheless, he described a process which, if it occurs, shows immediately how the genes underlying morality and other aspects of human sociality could have become common.

But Darwin's insight was dismissed for more than a century because of several intellectual blind spots that have begun to fall only in recent years.

First, people did not want to abandon the idea that morality is the bright line that separates people from animals. Darwin's idea that there was a continuum of the social instincts from social animals to man cut right through that line. Even biologists didn't like the idea that morality had been shaped by natural selection. If morality had a genetic basis, it must have arisen as an unintended by-product of some other process, they argued. "I account for morality as an accidental capability produced, in its boundless stupidity, by a biological process that is normally opposed to the expression of such a capability," wrote George Williams, a leading evolutionary biologist, in 1988.²⁴

Second, the idea that natural selection works at the level of groups has been rejected by most evolutionary biologists, largely under the influence of George Williams. He argued that selection of genes through the individuals who carry them was far more likely and should be assumed as a matter

of principle unless there was strong evidence to the contrary.²⁵ So though group selection might be theoretically possible, he contended that “group-related adaptations do not, in fact, exist.”

Darwin’s thesis about the evolution of morality raises a seriously disturbing possibility. He was saying that morality, viewed by some as man’s noblest achievement, arose from warfare, the least noble, and that the brisker the pace of warfare the more rapidly would morality have blossomed. This suggests that people were highly aggressive in the distant past, an implication that has raised a third mental block. Many social scientists are reluctant to believe that people were more violent in the past than they are today. Archaeologists, seeking to avoid glorification of war, have contrasted the carnage of modern wars to the peaceable behavior of human foragers before agriculture and the birth of cities. Only recently has a careful survey shown how constant and merciless was the warfare between pre-state societies, much of it aimed at annihilating the opponent.²⁶

A fourth obstacle to understanding the evolutionary nature of morality has been the insistence by some researchers who study animal behavior that it was fallacious to attribute complex emotions to them, especially positive ones. The primatologist Frans de Waal reports that in his studies of peacemaking among chimpanzees he was instructed to use dehumanized language. A reconciliation, sealed with a kiss, had to be described as a “post-conflict interaction involving mouth-to-mouth contact.”²⁷ Given the evolutionary closeness of humans and chimpanzees, de Waal considered that the two species were likely to have similar emotions. Excessive fear of anthropomorphism had long stifled research on animal emotions, in his view. It also prevented biologists from acknowledging the continuum of social instincts that Darwin recognized between social animals and people.

After decades of neglect because of these various intellectual road-blocks, the evolutionary origins of morality have been slowly resurrected as a fit subject of research. William Hamilton’s theory of kin selection explained how altruism could evolve in kin-based societies, like those of the social insects. Another biologist, Robert Trivers, showed how, even in groups of individuals who were not related to one another, natural selection could favor reciprocal altruism—doing someone a favor on the assumption it would be paid back later. These ideas were developed by Edward O. Wilson in his landmark 1975 book *Sociobiology* and extended from animals to people. “The requirement for an evolutionary approach to ethics is self-evident,” he wrote.

Sociobiology, though intended by its author as merely a synthesis of new biological ideas, posed a political challenge to Marxists and much of the academic left. It showed how the human mind was not a blank slate, on which governments could write whatever ideological prescriptions they wished in order to shape Socialist Man, but was already shaped or predisposed by evolution to behave in certain ways. Wilson’s book was assailed by Marxist colleagues at Harvard, such as the geneticist Richard Lewontin. Students disrupted Wilson’s lectures and harassed even Hamilton and Trivers. Researchers dared not use the word *sociobiology*, even if they agreed with its ideas, lest they be caught up in the furor. Sociobiology, as applied to people, is now pursued mostly under the name of evolutionary psychology.

Richard Alexander, after the storm over *Sociobiology* had settled, was one of the first biologists to resume the study of morality. Human ancestors lived in groups, he argued in a book published in 1980 as a defense against other human groups, and warfare had been a major influence in human evolution. Usually predators find it most efficient to live in small groups (wolves, lions, killer whales) while their prey animals that congregate in large herds for defense. But humans departed from this rule, probably because their most feared enemies were other human groups. Incessant warfare led to selection for greater social complexity and intelligence, and the larger societies required ever greater self-

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