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Supernaturalizing Social Life

Religion and the Evolution of Human Cooperation

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Abstract This paper examines three ancient traits of religion whose origins likely date back to the Upper Paleolithic: ancestor worship, shamanism, and the belief in natural and animal spirits. Evidence for the emergence of these traits coincides with evidence for a dramatic advance in human social cooperation. It is argued that these traits played a role in the evolution of human cooperation through the mechanism of social scrutiny. Social scrutiny is an effective means of reducing individualism and enhancing prosocial behavior. Religion's most ancient traits represent an extension of the human social world into the supernatural, thus reinforcing within-group cooperation by means of ever-vigilant spiritual monitors. Believing that the spirits were always watching may have helped reduce the number of non-cooperators within a group while reinforcing group behavioral norms, thus allowing humanlike levels of cooperation to emerge.

Keywords Ancestor worship · Cooperation · Evolution · Religion · Shamanism · Upper Paleolithic

Introduction

Considerable attention has been paid recently to the evolutionary origins of two distinctively human characteristics: our propensity toward religion and our unusual level of cooperation (Atran 2002; Boyer 2001; Fehr and Fischbacher 2003; Gintis 2000; Irons 2001; Sober and Wilson 1998; Wilson 2002). The thesis of this paper is that the two are related through the mechanism of social scrutiny. Specifically, it is argued that (1) social scrutiny is a highly effective means of curbing individualism and promoting prosocial behavior in humans; (2) the first evidence of three of religion's oldest traits (ancestor worship, shamanism, and belief in natural spirits)

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dates to the Upper Paleolithic, coincident with a dramatic advance in human social cooperation; and (3) these traits represent a "supernaturalizing" of social scrutiny which helped tip the balance away from individualism and toward community. By enlisting the supernatural as an ever-vigilant monitor of individual behavior, our ancestors "discovered" an effective strategy for restraining selfishness and building more cooperative and successful groups.

Religion and Human Cooperation

Humans are by nature social creatures. As primates, our hominin ancestors were predisposed toward the formation of strong social bonds. Of the approximately 150 different species of monkeys and apes, only one (orangutan) does not live in some form of social group (Dunbar 1988; Smuts et al. 1987). Our closest relatives, chimpanzees and bonobos, live in fission–fusion societies of 50 or so members. Social living, however, requires mechanisms for binding individuals to each other and for tempering pernicious individualism.

Recently, some have argued that the mechanisms explaining cooperation in nonhuman species, such as kin and reciprocal altruism, are inadequate for understanding human cooperation and that a form of group-level cultural selection may be required (Fehr et al. 2002; Gintis 2000; Sober and Wilson 1998; Sterelny 1996). A key issue in these models is reducing the benefit of selfishness to a level below that of the gain in individual fitness achieved by being part of an altruistic group. For this to happen, within-group altruism must carry little individual cost ("cheap" altruism) otherwise it will be swamped by the benefit of individual selfishness. To accomplish this two conditions must be met: (1) defection (non-cooperation) must be punished by cohesive, stable, and broad-based coalitions wherein the cost to individual coalition members is low and the deterrent effect is high; and (2) the number of defectors within a group is low so the need to punish is infrequent (Boyd et al. 2003; Sethi and Somanathan 1996; Sterelny 2003, pp 125–137).

Assuming the validity of these models, a critical evolutionary question is: How did our ancestors establish and maintain these conditions such that "human" levels of cooperation could emerge? A number of mechanisms for bringing this about are certainly possible, and religion may only have been one factor among several. Thus, religion's specific adaptive contribution need not have been dramatic. It need only have collaborated in tipping the balance in favor of cooperation by helping to solidify enforcement coalitions and by reducing levels of individual defection. The next section addresses how religion could have accomplished this: by expanding social scrutiny to include the supernatural.

Social Scrutiny and the Reduction of Selfishness

Cheating (taking benefits without repayment) undermines reciprocal altruism. Cheating, however, can be drastically mitigated when people know they are being watched. Considerable social science research has demonstrated that when people know their actions are under public scrutiny they adhere more scrupulously to group norms, and behave more reasonably, courteously, generously, honestly, and bravely

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(especially for men) than when their actions are concealed (Burnham and Hare 2007; Buss 1980; Diener and Srull 1979; Duval 1976; Kleck et al. 1976). In fact, a recent study has shown that the "observer" need not be human or even alive to affect behavior. Burnham and Hare (2007) found that generosity to a communal pot increased 30% when subjects were under the gaze of an image of a cute-looking robot face (Kizmet) compared to when donations were done "privately." Even when our rational minds know we are not being watched, the mere suggestion of public scrutiny affects us at a more primal level. Publicly observed behaviors are also known to have more potent ramifications on one's self-perception than private behaviors (Baumeister and Tice 1984; Tice 1992). The powerful effect of public observation stems from two sources: reputation building and fear of punishment, both of which very likely played an important role in the evolution of cooperation in our ancestral past.

Reputation

The fitness risks inherent to reciprocal altruism can be reduced by cooperating only with those who have a history of repaying debts, known as *indirect reciprocity* (Alexander 1987). Indirect reciprocity implies that reputations can be an important currency in the establishment of reciprocal arrangements, and there is evidence that humans are exquisitely sensitive to reputation. Among many hunter–gatherers a man's reputation as a successful hunter serves as a "quality display" affecting both his social status and reproductive success (Gurven et al. 2000; Hawkes and Bird 2002). In "honor" cultures such as the Saga of Iceland or the American South, social order was based on individual reputations for upholding social expectations (Cohen and Vandello 2001; Miller 1990).

Recently, "public goods" games have provided an avenue for investigating reputation-building, reciprocity, and altruism (Engelmann and Fischbacher 2002; Milinski et al. 2002; Nowak and Sigmund 1998; Wedekind and Milinski 2000). Findings indicate that when subjects know a person has behaved selfishly in an earlier round of the game, they are significantly less helpful to him/her in subsequent rounds compared with an unselfish person (Milinski et al. 2002). Furthermore, this helping behavior itself is affected by whether or not one's reputation is being impacted by the act of helping. A recent study found that those in a position to be generous were half as likely to do so if their generosity was irrelevant to their reputation (Engelmann and Fischbacher 2002). These studies suggest that we are naturally inclined to keenly observe others and adjust our behavior toward them accordingly, while doing our best to ensure that our public actions have the highest possible reputation payoff.

Research with public goods games has been carried out in numerous industrialized societies (United States, Western Europe, Yugoslavia, Japan, and Israel) and 15 hunter–gatherer or small-scale societies in 12 countries across five continents (Henrich et al. 2001; Roth et al. 1991). While quantitative variability in generosity is present across these samples, general patterns have also emerged. In nearly all cases, people evidenced a profound concern for establishing and guarding a public reputation for (culturally defined) fairness, and they were willing to engage in costly punishment of those who violated social norms.

Human reputation effects are also magnified by language. A reputation-relevant action need only be observed by a single other person (even surreptitiously) to have enormous consequences for the actor's public image. This fact is not lost on hunter–gatherers, who vigilantly and vigorously enforce their egalitarian ethic using gossip, cautionary tales, threats to reputation, and occasional physical aggression (Boehm 1999, 2000; Hawkes and Bird 2002; Lee 1979). That reputations can suffer based on covertly observed actions may well have made the notion of supernatural observation a relatively effortless stretch for the evolving human mind.

Punishment

Public scrutiny has an impact not only on reputation, but also on physical well-being. When public shame or threats to reputation are inadequate to subdue uncooperative tendencies, our ancestors may very well have resorted to physical punishment. Unlike other primates, humans are especially accurate and lethal throwers (van Lawick-Goodall 1968; Westergaard et al. 2000). Our ancestors may have used projectiles to threaten or injure non-cooperators (stoning), thus providing further incentive for curbing destabilizing individualistic tendencies (Bingham 1999; Calvin 1993). Contemporary research has demonstrated the zeal with which humans engage in moralistic punishment (punishment of perceived non-cooperators), even when it is personally costly (Fehr and Gächter 2002; Fehr and Tyran 1996). To achieve humanlike levels of cooperation in relatively large groups (roughly 10–50 individuals) punishment of cheaters and possibly even punishment of non-punishers of cheaters may be required (Boyd et al. 2003; Fehr and Fischbacher 2003).

This body of work indicates that we are naturally hyper-vigilant against freeloaders and cheaters who threaten group cohesion, and that we have effective means of bringing them into line. Chief among these means is social pressure, whether in the form of rewarding virtue or punishing egoism. If, as some have argued, group-level competition was an important selected force in our ancestral past (Boyd et al. 2003; Gintis 2000; Sober and Wilson 1998; Sterelny 2003), then an advantage may have accrued to those groups that fortified social pressure with powerful spiritual agents who monitored every act with a constant critical gaze. Supernaturalizing social pressure may have been one of the strategies that tipped the balance against individual selfishness, thus permitting uniquely human levels of cooperation to emerge.

Religion, Adaptation, and the Upper Paleolithic

Researchers disagree as to whether religion constitutes an adaptation. Some contend that it is best understood as an evolutionary by-product parasitized on other adaptive mental processes (Atran 2002; Barrett 2000; Boyer 2001; Guthrie 1993). Others argue that religion offered fitness advantages through increased group cooperation and solidarity (Alcorta and Sosis 2006; Richerson and Boyd 1998; Wilson 2002). Alcorta and Sosis, for example, argue that while it is entirely possible that our religious propensities originated as by-products of adaptive mental modules, there is evidence that religion has modified those modules in specific ways in response to ecological challenges. In their view, the mental capacities giving rise to religious

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imagination may not have been originally selected for that end, but once envisioned, religion may very well have been adaptively co-opted. This position is the one more compatible with the argument being advanced here.

Religion's role in the evolution of cooperation is further complicated by the fact that humans and hominins were cooperative long before any evidence of religion can be found. There is, however, a level of cooperation that is late-emerging and, quite probably, uniquely human. Although evidence of cooperation in the form of mutualism, kin selection, and reciprocity can be found among many nonhuman species (de Waal and Luttrell 1988; Scheel and Packer 1991; Wilkinson 1984), evidence for indirect reciprocity, strong reciprocity (the personally costly rewarding and punishing of others based on their adherence to group norms), and cooperation among non-kin in large social groups is rare to nonexistent outside of *Homo sapiens* (Boyd et al. 2003; Gintis 2000; Dugatkin 2001; Dugatkin and Wilson 1993). It is plausible that religion played a role in the emergence of this "higher level" of cooperation. Cross-cultural analyses have shown that as societies become larger, more complex, and more threatened by external forces, the tendency to believe in moralizing gods also increases (Roes and Raymond 2003).

Archaeological evidence points to a dramatic advance in the human social world in the Upper Paleolithic (about 35,000 BP). This advance included more cooperative and effective hunting strategies, more sophisticated tool and cultural production, and dramatic increases in group size, social complexity, and political organization (Hayden 2003, pp 122–131; Mellars 1996; O'Shea and Zvelebil 1984; Vanhaerena and d'Errico 2005; see Dickson 1990, pp 84–92, 180–189 for a summary). Coincident with this social advance is the first evidence for the religious practices of shamanism, animism, and ancestor worship. Echoing Rappaport (1999), the current paper adopts the view that this coincidence is more than mere accident. Religion played a non-trivial role in the achievement of human society.

Supernaturalizing Social Life: Religion's Ancient Traits

A central proposition of this paper is that religion's earliest traits represent a supernatural extension of human social life (this may be true for religion *in general* as well). The term "supernatural" is controversial in anthropology (for discussions see Klass 1995; Lett 1999; Lohmann 2003a; Saler 1977). Though wide cultural variation exists in its meaning and use, the current paper follows Lohmann's (2003a, pp 176) lead in defining "supernatural" as the "extension of the volitional schema" to phenomena devoid of intention and will. In other words, the falling rain is caused by spiritual forces that desire good or ill for those who are getting wet.

Less contentious is the notion of religion as a supernatural extension of human social life. In 1912 Durkheim (1965) saw religion as providing divine authority for social norms. Horton (1960, pp 211) focused more on social relationships: "Religion," he wrote, "[could] be looked upon as an extension of the field of people's social relationships beyond the confines of purely human society." Guthrie (1993) elaborated Horton's approach by identifying anthropomorphism as both the key motivator behind this extension and the mechanism for creating spirit/human relationships.

The current paper builds on this foundation, identifying the supernaturalizing of social life with three widespread and ancient traits of religion: ancestor worship, shamanism, and the animistic belief in natural and animal spirits. Although these traits appear to be the earliest (or among the earliest) that can be detected in the archaeological record, they may or may not be religion's *original* traits. We will likely never know exactly what religion was like when it first emerged. Furthermore, the fact that these "ancient traits" represent a supernaturalizing of social life is not meant to suggest that more recent traits (such as monotheism or articulated theologies) do not also serve this function—quite often they do. That this characteristic is "conserved" even as religion evolves and changes lends further support to this paper's central thesis. The significance of these particular ancient traits, however, is that (a) they appear to be coincident with evidence of a substantial advance in human social complexity, and (b) they indicate that as far back as we can trace religion in the archaeological record it has possessed the characteristic of supernaturalizing social life.

Ancestor Worship

Ancestor worship is widespread across traditional religions ("traditional" as opposed to "book" religions; see Hayden 2003, pp 5–12 or Howells 1948, pp 2–5) in Africa, Asia, the Pacific Islands and the South American Tropics (Eliade and Couliano 1991; Harvey 2000; Lee and Daly 1999, eds.). In his survey of traditional African religions, Parrinder (1976, pp 24) states flatly, "All Africans believe in the ancestors, as ever-living and watchful." This belief, however, does not always translate into recognizable rituals. Efe Pygmies regularly interact with ancestors in the forest and in dreams, but there are hardly any activities of worship identifiable to outsiders (Sawada 2001). The role of the ancestors is more ambiguous among native populations of North America. Among tribes in the East and on the Plains, ancestor cults are infrequent and, as is the case with many native Australians, the recently departed are often regarded fearfully (Hayden 2003, pp 184; Hultkrantz 1967, pp 129). Interestingly, it is among the more socioeconomically stratified populations of the Northwest Coast and California where ancestor worship is more prevalent (Eliade and Couliano 1991, pp 199–200). Along with cross-cultural evidence of ancestral worship's (near) universality, archaeology provides evidence of deep evolutionary roots as well.

Haeological Evidence: Upper Paleolithic Burials

Though a variety of interpretations must be acknowledged, a substantive case can be made that Upper Paleolithic and Neolithic burials provide some of the first credible evidence of ancestor worship. Evidence of intentional burial with possible grave goods is present prior to the Upper Paleolithic. However, with the Upper Paleolithic intentional burial becomes associated with two other factors that strengthen the case for ancestor worship: social complexity and elaborateness.

The Upper Paleolithic marks the first evidence for socioeconomically stratified societies (see review in Dickson 1990, pp 84–92, 180–189). Resource abundance and technological advances allowed some Upper Paleolithic peoples to move from

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being egalitarian hunter–gatherers to transegalitarian or complex hunter–gatherers (Butzer 1971, pp 463; Dahlberg and Carbonell 1961; Dickson 1990, pp 182; Hayden 2003, pp 122–131; O'Shea and Zvelebil 1984; Price and Brown 1985; Vanhaerena and d'Errico 2005). Complex hunter–gatherers typically use more sophisticated technologies for harvesting and storing seasonally abundant resources (e.g., nets or traps to catch large quantities of fish during spawning season). This leads to a more sedentary lifestyle with greater private ownership of resources and more pronounced social inequalities.

In contrast to their role among egalitarian hunter–gatherers, ancestors play an increasingly prominent role in complex hunter–gatherer societies (Freedman 1965, 1970). Resource-rich territories (streams abundant with fish, certain migration routes, etc.) critical to an entire community's well-being and prosperity are typically claimed by elite families within the tribe by virtue of their ancestral lineage. For example, among the Tlingit of North America's Northwest Coast, the *anyeti* or nobles are typically from clans who claim ownership to the fishing weirs (traps) in the most prized territories (Oberg 1973). Social elites typically justify their privileged status through their filial link to powerful ancestors in the supernatural realm, whose benevolent proprietorship over resource-rich territories generously provides for the entire tribe.

In the Upper Paleolithic evidence of unambiguously elaborate burials is also present. Burial sites such as Sungir (White 1993), Dolni Vestonice (Klima 1988), and Saint-Germain-la-Riviere (Vanhaerena and d'Errico 2005) attest to the presence of an elite class whose members were laid to rest with great ceremony and lavish grave offerings. Among more recent complex hunter–gatherers, burial of this character usually occurs under the expectation that the deceased is soon to take his or her place as a powerful ancestor in the supernatural realm (Hayden 2003, pp 239; Sandarupa 1996). Arguably the most impressive Upper Paleolithic burial site is that of Sungir, about an hour's drive from Moscow. Here three bodies were uncovered—an adult male and two adolescents. Each was elaborately adorned with thousands of fine ivory beads, necklaces, and bracelets. Additionally, ivory spears and other artifacts were interred with the bodies. White (1993) has estimated that the labor-hours necessary to produce the beads alone would have run into the thousands, per body! Though less elaborate than Sungir, the triple burial at Dolni Vestonice in the Czech Republic features bodies lavished with necklaces of ivory and pierced canine teeth, while at Saint-Germain-la-Riviere a young adult female was interred with "imported" and carefully perforated deer teeth ornaments (Klima 1988; Vanhaerena and d'Errico 2005).

The Neolithic (8000–3000 BP) site of Lepinski Vir provides evidence of burials within domestic structures. Located on a bank above the Danube in the Carpathian mountains, Lepinski Vir is composed of about 50 permanent structures, many of which contain unusually large hearths, decorated with carved boulders, human bones, and other artifacts. In many structures, a burial vault is located below the hearth (Srejovic and Babovic 1983; Srejovic and Letica 1978; see also Hayden 2003, pp 159–164). The small size of the structures and the scarcity of domestic refuse suggest that Lipinski Vir was not a permanent residence, but instead an intermittent religious site where feasts, rituals, and veneration of the dead took place. Other similar Neolithic gravesites have been found at Sannai Maruyama, Japan (Iizuka 1995), and in

Skateholm and Bredasten in Scandinavia (Larsson 1987–1988, 1985–1986). These sites may be analogous to sacred sites honoring the dead found among Northwest Coast Native Americans, Maya Indians of Central America, and Melanesian Islanders (Hayden 2003, pp 162). The monuments, ornaments, and grave offerings associated with Upper Paleolithic and Neolithic grave sites are consistent with practices of ancestor cults of extant complex hunter–gatherers.

The Ancestors as Social Players

Archaeological evidence suggests that ancestral cults may reach deep into human history. Anthropological evidence indicates that ancestors are social players in the ongoing activities of the *living* community (Platvoet 1993). From his years of living and working with Malawi tribesmen, missionary and anthropologist T. Cullen Young concluded:

> … African men and women in the backland villages, life from day to day, and we might legitimately say, from moment to moment, has no meaning at all apart from ancestral presence and ancestral power… [T]he African community is a single, continuing unit, conscious of no distinction, in quality, between its members still here on earth, and its members now there, wherever it may be that the ancestors are living (cited in Parrinder 1976, pp 57, 65).

Wherever ancestor worship or veneration is found, the ancestors themselves are represented as "interested parties" in the current affairs of the living community. For example, among the Kwaio people of the Solomon Islands, the ancestors (or *adalo*) are believed to be constantly present as bearers of both good and bad fortune (Keesling 1982). They play a role in the health, prosperity, fertility, and general success (or lack thereof) of the living community, and are especially attentive to rules of *abu* (or taboo). Violations of abu can anger an ancestor and bring about misfortune unless proper sacrifices are made.

Among the Lohorung Rai of Nepal, a newborn baby is not considered a community member or even a "person" until it is ritually "introduced" to the ancestors. This ceremonial introduction is believed to be essential to the future health and success of the infant, so much so that until it is completed (usually 5 or 6 days after birth) all other ancestral rites *by all* households within the community are prohibited (taboo). In this way, the ritual demands of the ancestors force the entire community to be involved in the future prospects of every newborn (Hardman 2000). Though important cultural variations exist, the notion of ancestors as "interested parties" who desire propitiation and punish cultural transgressions is a common theme worldwide (Boyer 2001; Harvey 2000; Lee and Daly 1999).

Why are the ancestors interested? The reasons can vary, but cross-culturally a few themes emerge. Often the land and the ancestors are intimately connected. Among many African tribes, ancestors are the ultimate owners or proprietors of the land and are responsible for its productivity (Parrinder 1976). Among Australian aboriginals, ancestors are thought to be a part of the land itself—creators who returned to the creation when it was finished (Hume 2000). In other instances, ancestors are thought to return to the community in the form of animals who provide information or resources to the living. Among native Javenese, the honored dead might take the

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form of a tiger (Beatty 1999). For the Wari' of South America, spirits of the dead sometimes take the form of fish or wild pigs (peccaries) that allow themselves to be killed to provide food for the community (Conklin 2001).

In other societies, such as the Maori or many traditional African tribes, the ancestors' very existence depends on the fertility and fidelity of the earthly community. By remembering the ancestors though cultural traditions, and by procreating – which provides a means for the ancestors' rebirth into the community – the existence of the ancestors is sustained (Berndt and Berndt 1964, pp 188; Parrinder 1976, pp 59; Radin 1937, pp 14). Thus, ancestors are thought to be especially concerned with upholding social order through right behavior, observance of tradition, and avoidance of taboo, so as to ensure the community's continued fecundity and the security and legitimacy of its offspring. Finally, the ancestors may simply be regarded as powerful spirits who can provide protection, fertility, and prosperity in return for honor and sacrifice (Woodward 2000).

However it is envisioned, the ancestors' role is unambiguously *social*. They are ever-watchful, active players in the social world with interests, concerns, and goals that must be considered in the everyday affairs of the living. This is emphasized by the fact that the living often regard the ancestors with the same emotional cross-currents that typically characterize relations with a parent or higher-ranking associate-respect, fear, affection, and occasionally resentment (Field 1961, pp 145; Kuper 1961, pp 192–193). This is consistent with cross-cultural psychological studies showing that the God–person relationship more often resembles that of parent–child (or teacher–child in Japan) than that of romantic partners (Fortes 1959, pp 78; Kirkpatrick 1997, 1998; Saski and Nagasaki 1989; Vergote 1969). Though physically departed, the ancestors remain active, attentive "elders" of the earthly family.

Shamanism

Strictly speaking, shamanism is associated with traditional societies across Siberia, Central Asia, and the Saami regions of Scandinavia (Campbell 1983). Shamanistic practices of one form or another, however, have been observed worldwide (a notable exception being the Siriono of Bolivia, who appeared not to have shamanistic practices when first contacted; Balée 1999, pp 108; Townsend 1999; Vitebsky 2000, pp 55–56). The term "shaman" comes from the Tungus root *saman* meaning "one who is excited or raised" or simply "to know" (Campbell 1983, pp 157; Guenther 1999, pp 427). This reflects the fact that the shaman's function is to enter an altered state of consciousness wherein he or she connects with spiritual forces in order to gain knowledge or effect cures. Shamanism is one of the world's oldest forms of religious activity (Guenther 1999; Halifax 1982; Lee and Daly 1999; Winkelman 1990). Two lines of archaeological evidence trace it back to the Upper Paleolithic: the ritual use of deep cave sites and therianthropic images and artifacts.

Archaeological Evidence: Deep Cave Sites

Following in the tradition of Lommel (1967), a number of researchers have argued that Upper Paleolithic cave art reflects the experiences and rituals of early

shamanism (Dowson and Porr 2001; Eliade 1972; Halifax 1982; Hayden 2003; Lewis-William 1986, 2002). Lewis-William (2002, pp 144) notes that the idea of a three-tiered cosmos is a common theme in shamanistic traditions. In this view, the world of daily experience sets between spiritual worlds both above (in the sky) and below (underground, underwater). He interprets much of the Upper Paleolithic cave art as reflective of this theme. Additionally, Hayden (2003, pp 143–145, 148–151) has summarized a number of converging lines of evidence consistent with the hypothesis that Upper Paleolithic deep cave sites were venues for shamanistic rituals. First, caves are frequently understood ethnographically as a gateway to the underworld (Campbell 1983; Clottes and Lewis-Williams 1998; Lewis-William 2002, pp 169–170, 209). Second, remains that would suggest regular use, such as torches, fires, tools, or food are rare at these sites, suggesting that they were occupied only sporadically (Clottes 1992; de Beaune 1995). Third, the spaces where paintings and other ritualistic artifacts are found are often small and isolated, heightening the sensory effects that would induce ecstatic states (Campbell 1983).

Fourth, many of the animals depicted at these sites are not ones commonly used for food, but instead appear to have more symbolic importance as representations of power or ferocity. Furthermore, some of the animal images are purely mythic, such as the long-horned, horselike creature of Lascaux, possibly reflecting shamanistic hallucinations (Dowson and Porr 2001; Lewis-William 1986). Fifth, along with the strange animals, many cave sites also have bizarre symbols that Lewis-Williams and Dowson (1988) have shown bear a close association to the entoptic visual experiences of altered states of consciousness. Finally, at many of these sites, hand and footprints of children are present (Clottes 1992). Owens and Hayden (1997) have shown that among complex hunter–gatherers, children are commonly involved in rituals of initiation into elite societies where ecstatic experiences are used to call upon guardian spirits. Taken together, this evidence makes a plausible case that these deep cave sites were used for shamanistic rituals in which altered states of consciousness and union with the spiritual world were achieved.

Archaeological Evidence: Therianthropic Images and Artifacts

Upper Paleolithic cave art contains no less than 55 therianthropic images—half human/half animal (de Beaune 1998; Dickson 1990). A consistent theme in shamanism is that of "soul flight" in which, in the midst of an ecstatic mental state, the shaman's spirit inhabits that of an animal or unites with the animal's spirit (Townsend 1999; Vitebsky 2000; Winkelman 1990). Along with images, theiranthropic artifacts such as the half-man/half-lion face from El Juyo, Spain, or the lion-headed human statuette from Hohlenstein, Germany, have also been found (Freeman and Echegaray 1981).

To some archaeologists a few cave art images appear to depict clear shamanistic themes. The "sorcerer" image from the sanctuary at Les Trois-Freres shows a partially upright, horselike creature with reindeer antler, owlish eyes, bear paws, and human beard. It has been interpreted by some as a shaman uniting with his animal spirit-helper (Dickson 1990, pp 115). Even more stunning is the image located in the shaft at Lascaux. Just below a drawing depicting a wounded bison, a man with a birdlike head appears to be suspended in midair or possibly falling. The man's body

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is rigid and he appears to have an erection. Adjacent to him is a bird perched upon a staff. The fact that the man is sexually aroused suggests that he is not dead but, more likely, in some highly emotional mental state. The birds, the staff, and a possible depiction of hunting or conflict (the wounded bison) are all motifs associated with shamanism that add credence to the notion that this is an ecstatic shaman in spiritual transformation (Davenport and Jochim 1988; Dickson 1990, pp 131–135). More recent rock carvings from Siberia, provide further evidence of ancient shamanism. These carvings, a few thousand years old, depict recognizable shamanistic paraphernalia, including antlered headgear, costumes, and wood-frame drums (Vitebsky 2000). An image depicting a figure in the antlered headgear characteristic of a shaman was recently found in the Fumane cave of northern Italy and dated to around 35,000 BP, potentially pushing the origins of shamanism to the very onset of the Upper Paleolithic (Balter 2000).

The Social Role of the Shaman

The shaman's popular image as a bizarre mystic often obscures his or her more important social function. This function, however, has not been lost on those who study shamanism carefully (Townsend 1999, pp 446, 450). Hultkrantz (1973, pp 34) puts the social aspect at the very core of his definition of the shaman: "a social functionary who, with the help of guardian spirits, attains ecstasy in order to create a rapport with the supernatural world on behalf of his group members." This rapport can take many forms. For example, a shaman may be called upon prior to a community embarking on an important activity, such as a hunt. The shaman may enter the spirit of the hunted animals and try to convince them not to resist the hunters, or the shaman may simply gather and report important information about the animals' movements and attitudes.

The shaman may also be asked to relieve community suffering from such things as a natural disaster, poor harvest, social discord, hunger, or illness. Individuals may seek out the shaman when suffering from sickness or misfortune. In either situation, the shaman's function is to communicate with the ancestors or spirits who may be responsible for the perils being suffered. Often, the shaman finds that violations of taboo have aroused supernatural anger (see below; also Burch and Csonka 1999, pp 59). By binding supernatural authority to the punishments incurred when taboos are broken, the shaman reinforces group norms. Whatever the specific task, the good shaman serves as an emissary to the supernatural world, intent on repairing or enhancing the community's relationship to the supernatural and to each other—or, as Vitebsky (2000, pp 63) puts it, "The mystic is also a social worker."

Two examples highlight this. Rasmussen (1929, pp 123–129) describes how a famine-threatened Iglulik Inuit village in northern Canada enlisted a local shaman to go on a spiritual journey to the (female) sea spirit Takanakapsaluk to find out why the community's recent hunts were unsuccessful. Before the gathered community and amid great drama and ritual, the shaman's journey commenced. Takanakapsaluk informed the shaman that the sea's bounty was withheld from the village because of their frequent violations of taboo. Upon the shaman's return, members of the community arose, one after another, confessing their various transgressions. The mass catharsis proved highly therapeutic as the session ended with a palatable spirit

of good will and optimism pervading throughout the community. Note in this example how the sins of individuals, heretofore successfully hidden from the human community, were brought to light through the shaman's intercession. Similar examples of this sort have been noted among shamanistic rituals in Nepal, Korea, and Japan (Townsend 1999, pp 443).

Among the Sora of eastern India, the shaman's role is somewhat different. Although the shaman (most are women) may intervene during a crisis, more often she acts as a sundry intermediary in the community's ongoing dialogue with the dead (Vitebsky 1993). Shortly after death, a person's spirit is thought to be volatile, causing mischief and mayhem among the living. Any illness or misfortune may be blamed on the *sonum* or spirit of a recently departed friend or relative. Mourners gather around a shaman, who calls upon the sonum so that it can be questioned about its actions, motivations, and state of mind. These dialogues may persist for weeks or even years as the living and the dead sort out their relationships. Often a negotiated settlement is achieved: the sonum agrees to become a guardian spirit to a child who is to bear his or her name. Though the shaman's role here is less dramatic, its social significance is no less crucial. Since the social world involves the dead as much as the living, the shaman is a vital thread linking the two-maintaining, repairing, and transforming the social bonds.

Animal and Natural Spirits

The belief in a spiritual force pervading all of nature is common among hunter–gatherers (Guenther 1999, pp 426; Harvey 2000). Powerful animal spirits play a prominent role in the art, myths, and religious beliefs of many traditional people, such as Australian Aborigines, Inuits, the Ainu, many native North and South American tribes, South African Bushmen, and the Jahai of Malaysia (Hayden 2003, pp 105–106; Hultkrantz 1967, 1994; Van Der Sluys 1999, pp 310). Some exceptions and variations are documented, however. Though Aka Pygmies believe in animal spirits, neither Mbuti nor Baka Pygmies do (Sawada 2001). Instead, Baka Pygmies believe in anthropomorphized "game spirits," while the Mbuti see the entire forest as a living spirit (Boyer 2001, pp 69).

Archaeological Evidence

Evidence for possible animal cults takes a number of forms in the archaeological record of the Upper Paleolithic. First, Upper Paleolithic cave art contains thousands of animal depictions, including the therianthropic and mythic images mentioned earlier. In some instances the arrangement of animals suggests a segregation into masculine and feminine motifs (Leroi-Gourhan 1968). Second, at both Les Trois-Freres and Chauvet caves there are chambers that appear to be dedicated to specific animals (or animal spirits). The Lion Chapel at Les Trois-Freres contains a large feline mural along with the remains of a fire surrounded by apparently deliberately placed bones (Begouen and Clottes 1986–1987). In the bear chamber at Chauvet Cave a bear skull was carefully placed atop a large limestone block. Below the block are the remains of a fire and more than 30 other bear skulls that seem to be intentionally placed (Chauvet et al. 1995, pp 42).

Third, at the Dolni Vestonice site, fragments of clay-baked animal forms dated to around 23,000 BP were uncovered that seem designed to explode when heated (Vandiver et al. 1989). Hayden (2003, pp 134) argues that they were probably used in a ritual associated with the celebration of animal spirits. Taken together, this evidence has compelled many investigators to argue that animal and other natural spirits played a prominent role in Upper Paleolithic religious practices (Bahn and Vertut 1988; Clottes and Lewis-Williams 1998; Leroi-Gourhan 1968).

The Spirits as Social Players

As with the ancestors, natural and animal spirits serve as an extension of the human social world. The spirits are social players whose interests and concerns must be considered in the activities of the living, especially activities that involve the utilization of natural resources. Individual exploitation of natural resources can be reduced by cultural prohibitions. These prohibitions can be made even more effective if buttressed by supernatural authority.

For example, in many hunting–gathering societies, hunting is not just a subsistence activity, but a sacred reciprocal exchange between intentional social actors (Atran 2002, pp 226–227; Bird-David 1999, pp 257; Brightman 1993, pp 2, 103, 187; Eder 1999, pp 296; Worl 1999, pp 63). The prey must be persuaded to give up its body to the hunter, and the hunter must perform proper rituals so the animal's spirit can be returned to the earth (Connors 2000; Hallowell 1975; de Waal Malefijt 1968). Related to this is the widespread concept of a "master of animals"—an ultimate animal spirit that guards nature against human exploitation and ensures the continual supply of animals through reincarnation (Brightman 1993, pp 91–93; Hultkrantz 1967, pp 59; Reichel-Dolmatoff 1978, pp 291–292). Hultkrantz (1967, pp 59) claims that this notion is "extensive" among native peoples in South America and "extremely common" in North America. Similar concepts are found among Efe Pygmies in central Africa, the Chenchu and Paliyan of southern India, and the Batak of the Phillipines (Bird-David 1999, pp 257; Eder 1999, pp 296; Gardner 1999, pp 264; Sawada 2001). Additionally, reference to a "master (or mistress) of animals" deity can be found in Minoan and Mycenaean mythologies (Nilsson 1950). Waste and sacrilege angers this master spirit, who may withhold resources from offending humans (as the earlier example involving the Iglulik sea goddess Takanakapsaluk highlighted).

Bringing nature into the human social sphere can exert a constraining effect on how humans utilize natural resources. For example, the Itza' Maya of the Guatemalan lowlands regard the forest and its resources not as objects to be managed or exploited, but as intentional players in a social game of reciprocity (Atran et al. 2002, 1999; see also Atran 2002, pp 219–227, 271–273). They believe that spirits actively protect the forest's animals and products and that improper behavior toward the forest angers these spirits, bringing retribution to the violator. In comparison with other groups utilizing the forest's resources, the Itza's practices prove to be less destructive and more sustainable. Brightman (1993, pp 76, 110, 186) documented a similar orientation among the Rock Cree of northern Manitoba and Saskatchewan.

Although the role of indigenous spiritualism as a specific mechanism for successful resource management has been subject to debate (e.g., Alvard 1994; Brightman 1993, pp 281–291; Connors 2000; Nelson 1993; Stearman 1994), there

are compelling examples showing that a shared religious orientation toward the land can be effective in getting competing communities to cooperate over collective resources. For example, religious ritual was central to the fishing practices of the Native Americans of the upper Klamath River of northwestern California. They addressed the *technical* problem of managing a critical resource (salmon) among competing groups *ritualistically.*

Sacred ritual marked the beginning and extent of the harvesting season so that no single group could dominate the resource at another's expense. No fishing was permitted until all the proper rituals were completed, and violations aroused the anger of both those conducting the rituals and the supervising spirits. Violators suffered the spirits' wrath, thought to be manifest in "bad luck" and a poor catch. So seriously were these beliefs taken that, as the rituals were conducted, people left the riverbank for the surrounding mountain slopes so as to avoid the sacrilege of even gazing on the fires built to cook the first salmon (Connors 2000; Swezey and Heizer 1993).

Recent analyses indicate that the Northwest Coast Indians had the skill, technical capacity, and appetite to decimate the Klamath Valley fish stocks but were culturally inhibited from doing so (Bunting 1997; Connors 2000, pp 146). Today, 30 species of salmon, including those of the Klamath, are on the endangered species list. Ironically, current laws governing fishing are similar to the proscriptions practiced by the Northwest Coast Indians, but the sacred orientation to the land is gone. (Conversely, where secular laws have been more successful, it is likely that visible enforcement has created the impression of a vigilant, ever-watchful government.)

Halfway around the globe, on the island of Bali, another example of a ritual solution to a resource management problem can be found. For centuries the native Balinese have grown rice on steep, terraced hilltops, sharing the water that flowed down the mountainside by diverting it from the main stream to the fields of different communities (or *subaks*). But how can one prevent those upstream from diverting all the water, leaving none for those downstream? This challenge is further complicated by the need to seasonally rotate fallow and active fields among the competing subaks. This organizational nightmare was managed effectively for centuries by the water temple system. The Balinese constructed temples honoring local deities at each branch in the downstream flow (Lansing 1991). The temples operated hierarchically, in that as one moved upstream the number of communities served by that temple increased, as did the generality of the deity (i.e., more people worship that deity). At the summit was the massive temple of Dewi Danu, the goddess of all the waters. Each temple was a meeting place and policy-setting center for the groups served by the diverted waters originating at that point. Disputes at one level could be taken up to the next level for resolution, with the high priest of Dewi Danu serving as the ultimate authority. Temple priests combined the technical knowledge of irrigation and rice cultivation with the metaphysical authority granted only to clerics.

In an attempt to increase productivity, the government recently sought to replace the water temple system with more modern practices and bureaucratic oversight. The results were disastrous (Lansing 1991, pp 124). Secular authority worked no better for the Roman aqueduct system. According to the ancient historian Frontinus, public water flows were often brought to a standstill because of landowners illegally diverting resources to "water their gardens" (Frontinus 1961, pp 405). Neither

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modern technology nor secular Roman law accomplished what the Bali water temple system did for centuries: ensure cooperation over a shared resource.

Religious ritual often targets utilitarian concerns (Walker 2001). Nearly 40 years ago, Roy Rappaport (1968) described how religious ritual constructively regulated inter-community conflict as well as other social, economic, and ecological factors among the Maring-speaking peoples of central New Guinea. The Klamath River and Bali examples amplify his original observations. Human cooperation often benefits when nature is viewed as an intentional social player.

Conclusion

To summarize: the first evidence for three of religion's most ancient traits (ancestor worship, shamanism, and animal and natural spirits) emerges in the Upper Paleolithic coincident with a dramatic advance in the human social world. These traits extend the human social world into the supernatural. Social scrutiny is an effective means of engendering prosocial behavior in humans. Supernaturalizing social life, by including ancestors, gods, and spirits as ever-vigilant and responsive social players, forced our ancestors to be more cooperative and socially responsible than they might otherwise have been.

The deepest roots of religion are entangled in the same social machinery that regulates all group living: concerns over cheating, reputation-building, reciprocity, fear of punishment, and the self-censoring effects of the social "eye." In our ancestral past, groups whose members used their religious imagination to construct a supernatural element to social life may have reaped a fitness advantage by expending less energy policing their members for insidious individualism. [Atran (2002, pp 278–279) has speculated along similar lines.]

Current Evidence and Future Tests

From this model a number of potential avenues for testing emerge. First, this paper has identified three ancient traits of religion and built a case for their role in the evolution of human cooperation through the mechanism of supernaturalizing social scrutiny. This model could be used to predict that other potential ancient traits, such as sacrificial rituals or totemism, would serve the same function. Totemism, for example, is complex but often carries with it the notion of a "guardian spirit" that guides and regulates individual behavior (Hultkrantz 1967, pp 66–83). Furthermore, the current paper has focused on the emergence of religion in the Upper Paleolithic in Europe. Archaeological evidence from Africa indicates a more incremental emergence of human culture and behavior (McBrearty and Brooks 2000). Consistent with the Upper Paleolithic in Europe, this model would predict that the earliest evidence of religion in the African archaeological record would be associated with increased social complexity and population densities.

This model also allows predictions about the evolution of religion. Specifically, even as religion evolves and changes, notions pertaining to the supernatural's interest in and monitoring of human behavior will be conserved. Although more in-depth

analyses are certainly required, a cursory look at the history of religion would seem to offer support for this hypothesis. For example, while monotheism (a relatively recent religious innovation) disposes with the idea of watchful animal or ancestral spirits, it strongly embraces the notion of an omniscient, omnipresent God (and seems not to discourage the idea of patron saints or guardian angels).

If religion's deepest roots are planted in the soil of social cooperation, then we might expect that groups bound by religion are more stable and cohesive than comparable secular groups. Sosis (2000; Sosis and Bressler 2003) has already provided evidence of this in his comparisons of the longevity of religious versus secular communes. In each year of their existence, religious communes were about four times more likely to survive relative to their secular counterparts. Furthermore, Stolle (2001) found that church groups exhibited higher levels of intra-group trust and commitment relative to other social groups, such as parent groups and bowling leagues. The additional (and to my knowledge as yet untested) prediction under this model is that members of religious communities avoid divisive individualistic behaviors because of their belief in "supernatural monitoring."

This model would also predict a relationship between social adjustment and religious activity, especially among the young. Studies have documented that religiosity is correlated with decreasing social deviance among adolescents (Jang and Johnson 2001; Merrill et al. 2001). A further prediction from this model would be that what lies at the source of this relationship is not necessarily religious doctrines, but the social elements of religion—that is, being actively involved in a community where human and supernatural scrutiny are being brought to bear to reinforce behavioral demands.

Developmental psychology provides further supportive evidence for this model. While animistic and teleological thinking (thinking the wind is alive or the sun shines to keep us warm) is well-documented among children (Keil 1979; Laurendeau and Pinard 1962; Piaget 1933), recent studies have found that children extend teleological thinking to artifacts and natural inanimate objects (such as chairs and rocks). Children appear to be "intuitive theists," naturally predisposed to interpreting the world as the intentional result of a designing deity (Barrett et al. 2001; Bering 2004; Evans 2001; Kelemen 2003, 2004). That these findings hold among British children argues against the notion that they are merely the result of the ambient religiosity of American culture (Kelemen 2003, 2004). Even more intriguing is that a child's understanding of God's mental states actually precedes that of other social agents. God (as opposed to parents or other humans) is uniquely understood as omniscient and in possession of strategically important information about intentions and motivations (Barrett et al. 2001; Boyer 2001). Consistent with the expectations of the current model, this research suggests that children are naturally prepared to embrace a social world that includes attentive supernatural agents.

Another avenue of testing concerns the implicit constraints on people's mental representations of supernatural entities. Though people claim that God is omniscient and omnipresent, they often describe him as having limited attentional capacities, such as saying that God would handle two simultaneously unfolding crises sequentially based on need (first saving a man's life and then helping a woman find her purse; Barrett 1998; Barrett and Keil 1996). Furthermore, Bering (2002) provides evidence that our representations of supernatural agents are often implicitly

constrained by our experience. Since omniscience and unlimited attentional capacities are beyond our experience, we have difficulty successfully incorporating these notions into our God concept.

This model would predict that the constraints operating on our supernatural representations are not just experiential but, more specifically, relational. In other words, we represent supernatural agents with whom we can relate. As Lohmann (2003b) has vividly described in his account of religious conversion, adopting a new religion is primarily the establishment of a new relationship with imagined supernatural agents and only secondarily the adoption of a new set of doctrines. Thus, the reason why we envision God as doing one thing at a time is because that is how we expect a good relational partner to behave (when he's paying attention to me he's paying attention to only me). Furthermore, we envision spirits as knowing things, not just because we can't imagine otherwise, but because we need them to know things if we are to relate to them. They know things that are relationally relevant (that we envy Fred his new car, not that conventional physics breaks down in black holes).

This emphasis on the relational qualities of supernatural agents is in keeping with Horton's (1960) observation that the God–person relationship exists on a continuum of manipulation (where people seek benefits of health or wealth) to communion (where people seek emotional intimacy). In modern societies where material and health benefits are increasingly accessible from society itself, religion becomes more about communion than manipulation. Following Horton, the current model would predict that religion in modern societies emphasizes communion over manipulation. The relative success of charismatic movements (in comparison to established churches) in largely secular societies is generally consistent with this prediction (see Bruce 2001, pp 70–71, 167–185).

If these and other tests continue to provide support for this model, then one might think of humanity as embarked on a grand post-enlightenment experiment to see if a more naturalistic and narrower conception of the social world is, in fact, more adaptive.

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