

Paper Title: The Religious Mind and the Evolution of Religious Forms

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Abstract:

This paper attempts to unite recent work on both the evolution of religion and the human mental attributes that incline us toward religious belief and practice. Using both archeological and anthropological data, Hayden (2003) has recently proposed a three stage model for the evolution of religion. These stages include: (1) a generalized hunter-gatherer stage of “egalitarian” religion (roughly 1mya – 35,000 ya), (2) a complex hunter-gatherer stage that featured the emergence of “elite cults,” “secret societies,” and a more well-defined “priestly” class who assumed responsibility for religious ritual, practice, and conceptual analysis (35,000 ya – 8,000 ya), and (3) a Neolithic domestication stage, where a clearly defined “trinity” of religious forms were established including “elite” religion, elite sponsored “popular” religion, and familial cults (8,000 ya – 3,000 ya).

Advances in the evolution of religion have been complemented by an increasing understanding of the human mental attributes that incline us toward religion and the evolutionary origins of that inclination. Researchers such as Arglye (2000), Atran (2002), Batson, Schoenrade, and Ventis (1993), Boyer (2001), and Hinde (1999) have all written extensively on the origins and characteristics of the religious mind. Though they come from varied perspectives, this body of work has converged on four mental attributes that provide the cognitive foundation for religion: (1) causal attribution and agency detection, (2) social/emotional commitments, (3) narrative function and the emergence of existential anxieties, and (4) the ecstatic or mystical experience.

This paper explores the connections between these two areas of research arguing that the evolution of religion can be understood in terms of the emergence of different facets of the religious mind. Earliest evidence of religion reflects the emerging human sense of self, although it may not have represented a fully-evolved narrative function. The social/emotional elements of religion appear to have been paramount during the egalitarian stage of religion. Here, religion served primarily as a vehicle for establishing and maintaining community bonds. The complex hunter-gatherer stage is marked by the increasing importance of mystical experiences, their interpretation, and their connection to supernatural forms of agency. Understanding the supernatural and controlling access to it, formed an important component of “elite” social control over an expanding and more complicated social world. Finally, the Neolithic domestication stage established the foundation for separate religious forms which ultimately gave rise to classic paganism. These forms each appeal to different aspects of the religious mind. “Elite” religion focuses on the mystical experience and supernatural agency. “Popular” religion focuses on the social/emotion aspects of religion. “Familial cults” appeal primarily to narrative function and the relief of existential anxieties.

## Biography:

Matt Rossano earned his BA and MA degrees in Psychology from the University of Dayton in Dayton OH, in 1984 and 1986 respectively. He earned a Ph.D. in Cognitive Psychology in 1991 from the University of California at Riverside. He is currently Professor of Psychology at Southeastern Louisiana University in Hammond, Louisiana. Matt has broad scholarly interests having published articles on spatial cognition, artificial intelligence and ethics, the evolution of consciousness, and a textbook on Evolutionary Psychology. He lives with his wife and many daughters in the small town of Independence Louisiana and invites everyone down to the annual Italian Festival held there every year on last weekend in April.

## Paper Text:

### **The Religious Mind and the Evolution of Religious Forms**

In recent years a substantial evolutionary literature has emerged in two related areas: religion and the religious mind. The purpose of this paper is to draw connections between these two areas. The connections found suggest the following conclusions: (1) the earliest forms of religion would have been focused on using ecstatic mental states as a means of social bonding. (2) As societies evolved from egalitarian to more complex and stratified, ecstatic rituals and supernatural accesses were increasingly dominated by social elites. Elite sponsored public feasting replaced public ecstatic ritual as a social bonding mechanism, while domestic, home-based cults served as a buffer against existential stress for the common folk.

### **The Evolved Religious Mind: Mental Attributes Giving Rise to Religion**

Considerable research recently has focused on the mental attributes that incline humans toward religious belief and the evolutionary background of that inclination (Arglye, 2000; Atran, 2002; Batson, Schoenrade, & Ventis, 1993; Boyer, 2001; Hayden, 2003; Hinde, 1999). Though investigators vary in their perspectives, they converge on four mental attributes that appear to provide the cognitive foundations for the emergence of religion: (1) agency detection and causal attribution, (2) the social and emotional commitments of group living, (3) narrative formation and the emergence of existential anxieties, and (4) the ecstatic or mystical experience. Each of these attributes is an evolutionary extension, built upon precursors found in many other species, especially our nonhuman primate relatives. From this perspective, religion is not seen as a single adaptation, but a highly likely pattern of thought based on a number of related inferences humans' draw about how the world—especially the human social world – works.

### **Agency Detection and Causal Attribution**

Determining cause-effect relations is an adaptive mental function found in many creatures (e.g. Hunt, 1996; O'Connell & Dunbar, 2005; Premack, 1976; Premack & Premack, 1994). Agency detection is a form of causal attribution whereby an organism assigns another's actions to an internal state such as a belief, desire, or motive. A rudimentary form of this mental capacity was likely present in our earliest hominin ancestors and may be present in great apes today (Byrne & Whiten, 1990; Gallup, 1970; 1982; Hare, Call, & Tomasello, 2001, however see also Ponvinelli & Eddy, 1996; Ponvinelli & Prince, 1998 for a more cautious assessment).

Developmental studies have shown that by the age of four or five, humans have a sensitivity to another's mind in that they understand that another can have ideas that are incongruent with reality (Wimmer & Perner, 1983). Even prior to this, infants show evidence of understanding human actions as goal-directed (Baldwin, Baird, Saylor, & Clark, 2001; Meltzoff, 1995). These findings suggest that from a very early age humans treat other humans as intentional agents, whose actions are directed by mental constructs such as beliefs, desires, and goals. Tomasello and Call (1997) have, in fact, argued that this is the critical cognitive distinction separating humans from other primates.

For our hominin ancestors, the ability to attribute agency to another would have been highly adaptive. By the time of *Homo erectus/ergaster* (about 2 million years ago) hominins had reached a physical size and a level of technical and social sophistication where their primary competitors were most likely other hominins (Alexander, 1989; Lewin, 1998). This competition would have encouraged the formation of larger groups with increasing numbers of non-kin, as well as the formation of coalitions and alliances both within and between groups. In this vastly complicated social world the ability to "read" the goals and intentions of others would have been crucial. A distinct advantage would have gone to those of our ancestors who could quickly and accurately recognize the signals associated with others who intended to harm or help. Thus, we would expect predator/protector agency detection mechanisms to be "trip-wired" such that only partial or scant input is required to engage the mechanism. It makes considerable adaptive sense to over-assign agency given that the "false alarm" cost would be far outweighed by the benefit of the occasional "hit." For example, incorrectly assuming that a rustling leaf sound is the approach of a dangerous predator could cause embarrassment. Embarrassment, however, is not life-threatening. A single failure to correctly identify an approaching predator could be. Therefore, survival is always better served by over-assigning agency than under-assigning.

Since it is by evolutionary design prone to over-assignment, the human agency-detecting capacity was ripe for cultural manipulation and supernatural extension. In other words, individual minds are readily accepting of cultural teachings concerning the pervasiveness of agency. The notion of powerful animal spirits and animal/human spiritual chimeras is nearly universal in traditional and shamanistic religions (Hayden, 2003, p. 57-60). Evidence from Upper Paleolithic cave paintings suggests that these ideas may extend back tens of thousands of years (Clottes & Louis-Williams, 1998; Dickson, 1990; Leroi-Gourhan, 1968). Animal or ancestral spirits who monitor people's actions for moral integrity and punish those who offend (often through acts of nature) are equally common motifs (Atran, 2002, Boyer, 2001; Hayden, 2003).

### **Social/Emotional Commitments**

A second important aspect of the evolved religious mind is the capacity for social commitment—a capacity that in humans has reached the unprecedented level of subjective commitment to social norms (Dugatkin, 2001). A number of researchers have argued that certain emotions appear to be unique to humans and may have evolved to enhance social cohesion (Barrett, 1995; Parker, 1998; Trivers, 1985). Self-conscious emotions such as embarrassment, pride, envy, guilt and shame require cognitive evaluation of our behavior against an abstract (group-based) standard (Parker, 1998). These emotions inform us about the quality of our interpersonal relationships and often drive us to behave in ways that further the establishment, maintenance, and reparation of social bonds. Humans also

appear to possess an irrational tendency toward moralistic aggression, which also serves to strengthen social cooperation (Bingham, 1999). Ernst Fehr (Fehr & Gächter, 2002; Fehr & Tyran, 1996) has shown that humans are quite willing to engage in moralistic punishment of perceived “freeloaders” even when to do so goes against one’s self interest.

Empathizing with others, feeling guilty when letting others down or prideful when having fulfilled or exceeded other’s expectations, and raging with righteous indignation against perceived cheaters, all appear to be essential elements of the human social regulatory psyche. These emotions help to build and maintain strong social bonds while curbing the self-interested behavior that can erode community spirit.

In the past, religion very likely harnessed powerful social emotions to reinforce social unity and to isolate and ostracize deviants. The religious feasts and ceremonies of hunter-gatherers often involve rhythmic dancing and the ingestion of psychotropic substances producing ecstatic emotional states that promote social bonding (Hayden, 2003, p. 30-32). Furthermore, Irons (1996; 2001) argues that religious rituals often serve as “costly-to-fake” signs of social commitment. The nearly ubiquitous initiation rituals of hunter-gatherers frequently involve rigorous physical and emotional trials (Power, 1998, p.122-125; Hayden, 2003, p.143-145). These trials serve as a public demonstration of an individual’s commitment to the group, its values, and to the spiritual forces governing them. Failure to live up to the group’s standards brings both profound shame and potential divine retribution.

Individuals who unambiguously demonstrate a belief in ever-vigilant supernatural agents who monitor the moral integrity of their actions may be viewed as more reliable by other group members and therefore worthy of enhanced trust and cooperation. Even in modern societies, a person who regularly attends church and openly insists on a religious wedding ceremony may be viewed as committed to the principles of monogamy and fidelity and therefore more desirable as a mate. Irons (2001, p. 304) notes that Honduran men whose work requires prolonged separation from their wives, frequently express a preference for a religious wife whom they believe will be less likely to cheat. Additionally, empirical evidence exists confirming that religious communities, in general, tend to be more socially cohesive and enduring than comparable secular ones (Sosis, 2000).

### **Episodic Memory and Narrative Construction**

Endel Tulving (1983) has argued for a distinction between episodic and semantic memory. Semantic memory refers to one’s stored knowledge of facts, concepts, and general principles of how the world operates. It need not be linguistic and is therefore common to humans and many other animals. Episodic memory is an autobiographic store of life experiences. It is context and time sensitive and allows one to mentally travel back in time to past personal past events and to project into the future, a form consciousness known as auto-noetic consciousness. Evidence for episodic memory in animals is questionable, and falls well short of human capabilities, thus suggesting that it may be unique to humans (Roberts, 2002; Tulving & Lepage, 2001).

Closely related to episodic memory and auto-noetic consciousness is language, another cognitive capacity largely (if not entirely) restricted to humans. A number of researchers have drawn the connection between human consciousness and left hemisphere linguistic function (Gazzaniga, 1995; McPhail, 1998; Ramachandran & Blakeslee, 1998). Using language, humans are able to construct a personal narrative that

unifies our experience and provides a stable, coherent sense of self that penetrates across time. This uniquely human, narrative-based, auto-noetically-aware sense of self, however, brings with it a somber companion – existential anxiety – knowledge of inevitable self-suffering and death. To some, religion represents an adaptation to mollify this anxiety (e.g. Bloom, 1992; Feuerbach, 1843/1972; Geertz, 1966; Malinowski, 1922/1961). For others religion is simply a likely inference that helps to resolve the mental contradictions and ambiguities surrounding death and dead bodies (Atran, 2003; Boyer, 2001).

Recently Atran (2003, p.177-181) has shown that religious sentiments are heightened when subjects are primed using stories that evoke existential anxiety. It is doubtful, however, that this anxiety turns us directly to the gods. Long-standing social science research shows that psychological stress, including existential stress, increases affiliative behavior and group/cultural identification (Aronson & Mills, 1959; Gerard & Mathewson, 1966; Greenberg, Pyszczynski, Solomon, Rosenblatt, Veeder, Kirkland, & Lyon, 1990; Kulik & Mahler, 1989; Kulik, Mahler & Earnest, 1994; Mills & Mintz, 1972; Schachter, 1959). Existential stress more likely turns us to the community, whose definition of the gods we accept in order to gain the physical and psychological support needed to assuage these fears.

### **Ecstatic States and Mystical Experiences**

An ecstatic state is an altered state of consciousness typically brought on by some form of sensory deprivation or over-stimulation, physical or emotional stress, and/or ingestion of psychotropic substances. Altered states of consciousness may be present in animals other than humans and may help them to cope with deprivation and stress (Prince, 1982). However, it appears that only humans can voluntarily facilitate ecstatic states or mystical experiences using meditative practices or religious rituals. Achieving this state is a key feature of Shamanistic religions (see Hayden, 2003, chapter 3).

William James (1961/1902) argued that ecstatic states or mystical experiences constituted the fundamental basis for religion. He identified four qualities that characterized this experience: (1) ineffability – the fact that the mystical experience cannot be adequately described in words; (2) noetic quality or enlightenment– this refers to the fact that while mystical experiences are profoundly emotional, they also provide deep insights to the individual involved. The individual believes that authoritative truths have been revealed through the mystical experience. Often these insights involve an awakening to the unity and of all things and a deep sense of “oneness” with the divine. (3) Transience – refers to the fleeting and temporary nature of the experience, rarely do they last longer than a few moments. (4) Passivity – though mystical experiences can be facilitated through meditative practices, rituals, and other techniques, their actual occurrence is spontaneous and unpredictable. The person accepts the experience and cannot “will” it to occur. Since James’s work other qualities such as realness and unusual percepts have been proposed as additional qualities (Farthing, 1992, pp. 442-443). Mystical states may occur in purely secular settings as well as in sacred rituals and are open to a variety of culturally and personally influenced interpretations (See Hinde, 1999, p. 185-198 for review).

The religious rituals that can bring about ecstatic states, such as those involving rhythmic dancing, chanting, stressful initiations, and the ingestion of intoxicants are also commonly used to establish ritual bonds among hunter-gatherers (Hayden, 1987). Furthermore, some research has suggested that the brain opioids released during ecstatic

states can promote social bonding (Hayden, 2003, p. 31). All of this opens up the possibility that ritually induced ecstatic states provide not only enlightenment to the individual involved, but may help to form strong social alliances within and among groups.

### **A Model of the Evolved Religious Mind**

What kind of mind does it take to be religious? The attributes just discussed give us an outline of just such a mind. The human mind is, first and foremost, a highly social mind with an elaborated set of emotions that promote inter-personal bonding. For good evolutionary reasons, the human mind promiscuously assigns agency to natural forces and objects producing supernatural agency. Supernatural agency combined with our powerful social emotions incline us to envision ever-vigilant spiritual agents who monitor us for trustworthiness and reliability. Exhibiting costly-to-fake signs of belief in these ever-vigilant supernatural agents and commitment to group moral standards provide individual benefits in the form enhanced opportunities for cooperative arrangements and access to important group resources. Our narrative capacity awakens in us the disturbing awareness of inevitable suffering and death. The individual's good standing within the group and the group's special status with the supernatural can offer both a buffer against the calamities of life and the hope for a redemptive afterlife. Finally, ecstatic experiences offer not only compelling validation of the supernatural realm our agency-detector envisions, but also, a social bonding mechanism among those who share its affects.

### **The Evolution of Religion: The Hayden Model**

In his recent book, *Shamans, Sorcerers, and Saints* archeologist Brian Hayden presents a comprehensive review of the archeological and anthropological evidence regarding the prehistory of religion (Hayden, 2003). He argues for a three stage model in the evolution of religion: (1) a generalized hunter-gatherer stage, (2) a complex hunter-gatherer stage and, (3) a Neolithic domestication stage that ultimately set the conditions for classic paganism. The following presents a brief review of Hayden's model, the evidence used to support it, and its connection to the religious mind.

#### **Stage One: Generalized Hunter-Gatherer Stage**

Three lines of evidence suggest the existence of ritualistic behaviors as far back as the Middle Paleolithic period (250,000 – 35,000 years ago [ya]) and perhaps even earlier: (1) cannibalism, (2) the symbolic use of red ochre and, (3) deep cave exploration. Each shall be discussed in turn.

##### **Cannibalism**

Evidence of cannibalism among our hominin ancestors provides some of the first possible hints of the emergence of religious sentiments. Among many hunter-gatherer societies eating the flesh, especially the brain, of another was tantamount to ingesting his spirit (Hogg, 1966; Sanday, 1986). This practice applied not just to enemies, but also (and more importantly) to relatives and fellow tribesmen. A loved one, kinsman, or fellow tribe member might be consumed so that his/her strength and skills would forever remain within the tribe. For example, among the Wari' of South America it is considered far more respectful and compassionate to consume a beloved friend or relative so that he or she is literally reincorporated into the tribe rather than allowing the remains to decay into the ground (Conklin, 2001). *Homo erectus* skulls unearthed from the Choukoutien site near Beijing suggest that cannibalism among hominins may date back as far as half a million years. Many of these skulls were apparently broken open from the bottom in a

manner similar to practices employed by more recent cannibals, suggesting that extraction and consumption of the brain might have been the goal (Hayden, 2003 p. 96-97; Weidenreich, 1943). Even more intriguing is an erectus skull found in Bodo, Ethiopia dated to around 600,000 ya. This skull contains 25 stone-tool cut marks presumably incurred when the skin was removed (White, 1986). Skin removal would seem to have no practical purpose and therefore hints at possible symbolic or ritual significance. Similar finds strongly indicative of cannibalism and possible ritual (i.e. multiple skulls with broken bases and/or cut marks) have been documented at Neanderthal sites in Kapina, Croatia and Abri Moula in southeastern France (DeFluer, Dutour, Valladas, & Vandermeersch, 1993; DeFluer, White, Valensi, Slimak & Cregut-Bonnoure, 1999). While certainly not conclusive, this evidence points to the possibility that half a million years ago or more, our hominin ancestors were venerating their ancestors by consuming their spirit.

### **Red Ochre**

Red ochre is a soft iron oxide that easily pigments other surfaces. The first indication that red ochre might have been used to deliberately color tools or other items comes from its presence at early Oldowan sites and South African caves dated to nearly 1 million years ago (Bednarik, 1994; Lorblancher, 1999). By 200,000 – 100,000 years ago, red ochre, along with other colors (yellow, brown, and also black manganese) had become more common at many hominin sites and was apparently being purposely mined and transported to habitation sites (Knight, Power, & Watts, 1995; McBrearty & Brooks, 2000). There is also some indication that red pigmentation may have been added to early symbolic artifacts to enhance their appearance and possibly their meaningfulness (Bednarik, 1995). The importance of all this lies in the fact that among present-day hunter-gatherers, red ochre carries significant symbolic meaning often associated with blood, life, or death, and is used extensively in rituals (Power & Watts, 1996). Its presence in the archeological record coupled with the effort that our ancestors were expending for its acquisition and its relatively low practical value suggests that its use was more symbolic than utilitarian.

### **Deep Cave Rituals**

Ritualized behavior is also suggested by the use of deep cave environments that appear to be devoid of any practical utility. For example, consider the Bruniquel Cave remains dated to around 50,000 years old. About a quarter of a kilometer deep in this cave found in southwestern France, Neanderthals apparently arranged broken stalagmites into a two circles, one of which surrounded the remains of a fire (Rouzaud, Soulier, & Lignereaux, 1996). Though the site requires further investigation, as of yet no evidence of tools, food, or other indications of regular habitation have been found. This pitch dark deep cave site may have been used for ritualistic purposes aimed at creating the altered states of consciousness necessary for a shaman's journey into the supernatural (Hayden, 2003, p. 101-102). Similar deep cave sites associated with Neanderthals have been reported at Galerie Schoepflin at Arcy-sur-Cure in France (Farizy, 1990; Baffier & Girard, 1998) and at Congnac and Grotta della Barura (Lorblancher, 1999).

### **Rituals, Religion, and Egalitarian Hunter-Gatherers**

None of the evidence just reviewed is conclusive of ritualized or religious behavior and alternative explanations are certainly possible. However, each is consistent

with known religious practices of extant hunter-gatherers and it is logical to assume that current practices have some evolutionary precursors. More importantly for Hayden's model is his contention that whatever form of religious activity this pre-Upper Paleolithic evidence indicates, it would have been associated with people who were egalitarian hunter-gatherers – that is, people who were nomadic foragers who largely spent resources as they were acquired and whose social/economic condition was egalitarian with little or no ownership of property or economic competition (Hayden, 2003, p. 123-126; Lee & Daly, 1999). This means that whatever religious beliefs were held or rituals were being conducted they would have primarily focused on enhancing group cooperation.

Strong cooperative instincts exist across many species, especially among kin (Hamilton, 1964). However, over the course of hominin evolution, groups very likely expanded to include large numbers of distantly related or non-related individuals (Dunbar, 1996). Cooperation based on reciprocity can allow non-related individuals to establish and maintain social bonds, however, reciprocal relationships are vulnerable to cheating (where one accepts benefits from another without payback). Since cheating would appear to be an evolutionarily advantageous strategy for anyone who could get away with it, those who wish to reap the benefits of reciprocity must choose partners carefully (Trivers, 1971). Religious rituals may have helped to establish stable reciprocity within hominin groups by acting as costly-to-fake signs of reciprocal commitment (Irons, 2001). For example, recall the hunter-gatherer initiation rituals discussed earlier. These trials serve as a public demonstration of an individual's commitment to the group, its values, and to the spiritual forces governing them. By enduring these trials, an individual signals to future potential cooperative partners that he/she puts the group's standards of sharing, bravery, and respect for elders and ancestors above self-interests and therefore is worthy of trust. In this way, divisive individualism can be suppressed in favor of intra-group cooperation and stability.

Equally important, if not more important according to Hayden (2003, p. 29-32), would have been cooperation across group lines. In conditions of resource stress (which he argues would not have been infrequent in our ancestral past) a group's survival would have depended on its ability to form alliances with neighboring groups who might be willing to (reciprocally) share resources. Highly emotional religious rituals that involve the attainment of ecstatic states can be a powerful social bonding event (Atran, 2003, pp. 163-164; Mills & Mintz, 1972). Hayden (2003, pp. 31-32) observes that among Australian Aborigines, rituals of this nature almost always involve members from more than one group. Among modern hunter-gatherers it is common for smaller family-based foraging bands to occasionally unite with other more distantly related bands for large scale feasts and ceremonies (Shostak, 1981). These ceremonies often include eating, drinking, ingestion of psychotropic substances, ritualized dances with masks and painted bodies, all which could induce the powerful altered states of consciousness that enhance social bonding.

### **Earliest Religion: Ecstatic States in Service to Social Unity**

The body of evidence reviewed above leads to the following proposition: Harnessing the ecstatic mental state in service to social cohesion formed the primordial foundation of religion. The most potent reason for suspecting this is the fact that it represents a simple extension from behavioral patterns already present in our primate ancestors, while other aspects of religion such as ancestor worship, relief of existential



anxiety and supernaturalism are more distance from that heritage. A precursor of the human ecstatic mental state may well exist in many animals in the form of the release of certain neurochemicals under conditions of stress or resources deprivation (Hayden, 2003, p. 33-34; Prince, 1982). The ensuing altered state of consciousness may help animals survive dire circumstances by concentrating metabolic resources and reducing unnecessary motor activity. A key difference that emerged among our ancestors is that ritual techniques were developed to voluntarily induced (and possibly intensify) what had otherwise been an involuntary reaction.

Social emotions and ritualized behaviors to enhance social bonding are also characteristics found in nonhuman species, especially our primate cousins. Behavioral indicators of empathy, attachment, anger, and other social regulatory emotions are present in great apes and other primates (de Waal, 1996). Furthermore, apes and other primates have a ritualized set of behaviors for expressing emotional states and establishing and maintaining social relationships. Much has been made of chimpanzee “rain dances” and other displays that suggest a religious expression directed at natural forces. However, rather than focusing on these interpretatively ambiguous actions as religious precursors, it seems more fruitful to direct attention to more mundane social behaviors such as the rituals that surround community reunions. Chimpanzees, bonobos, and spider monkeys live in fission-fusion societies where a larger community will often break into a series of smaller foraging parties. When these parties encounter each other after a period of separation, members will engage in “greeting” behaviors such as mutual embraces, kissing, group pant-hooting, and grooming (Goodall, 1986; van Roosmalen & Klein, 1988). Among bonobos, sexual stimulation will often be used to reduce tensions and allow food sharing even among members of distinct communities (de Waal, 1997). These ritualized greeting behaviors may induce a mental state conducive to social bonding which is similar to or approaching the ecstatic state. These behaviors may represent the nonhuman primate analogue to the reunion rituals and celebrations used when hunter-gatherer bands reunite. In sum then, all the elements for the harnessing of the ecstatic state via ritual in order to enhance intragroup and intergroup cooperation were likely present prior to the commencement of hominin evolution. The unique accomplishment of our ancestors was to consciously bring these elements together setting social life on path toward the supernatural.

### **Stage Two: The Complex Hunter-Gatherer Stage**

The Upper Paleolithic period (35,000 – 10, 000 ya) coincides with the emergence of complex hunter-gatherer societies. Complex hunter-gatherers are distinguished from generalized hunter-gatherers by their exploitation of seasonally abundant resources that promote a more sedentary lifestyle and larger population densities (Hayden, 2003, p. 124-126; Price & Brown, 1985). Technological advances that allow for the harvesting of seasonally abundant resources and the ability to store the surplus are key elements of the complex hunter-gatherer lifestyle. This ecological change brings with it other social changes as well including: increased private ownership especially of resource rich territories, increased social and economic inequalities, increased emphasis on human labor (and thus fertility) in order to expand resource harvests, and finally an increasing importance of family lineage (ancestors and descendants) as the proprietary basis for ownership and control of resource rich territories. In other words, a stretch of river (seasonally) teeming with salmon would be “owned” by a particular family within a tribe

and that ownership would be preserved through the ages as ancestors bequeathed it to their descendants. Thus, in complex hunter-gatherers one would expect an increasing emphasis on ancestor worship (as “providers” of wealth and critical resources) as well as fertility (as the assurance of continued wealth and resources). Archeological evidence from the Upper Paleolithic confirms this. It falls into three categories: (1) ritual burial indicative of ancestor worship, (2) artifacts indicating concerns over fertility and, (3) deep cave ecstatic rituals of initiation into secret societies.

### **Ritual Burial**

It is in the Upper Paleolithic that we find the clearest evidence of ritualized burial. Arguably the most impressive Stone Age burial site is that of Sungir about 100 km from Moscow in Ukraine. 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 (Klima, 1988). All told, about two thirds of Upper Paleolithic grave sites contain offerings such as jewelry and other grave goods (Hayden, 2003, p. 130). These copious offerings are what would be expected if the living were paying homage to loved ones now turned powerful ancestors.

### **Artifacts Expressing Fertility Concerns**

The ancestors provided wealth and descendants insured it. Thus, as predicted, the Upper Paleolithic also provides evidence of an increasing concern with fertility. Approximately 200 “Venus” figurines have been unearthed dated to Upper Paleolithic times (Hayden, 2003, p. 153). Venus figurines are small artifacts carved in ivory, bone, or stone that depict a naked, headless, female form with exaggerated breasts, buttocks, and abdomen. Sculptured, carved, and other graphic depictions of naked females and female body parts have also been found at such places as the rock shelter at La Madeleine and the caves at Les Combarelles (Hayden, p. 154; Hutton, 1991). Though less common, phallic carvings dated to the Upper Paleolithic have also been found (Soffer, 1985). Given the amount of effort and resources required to create these images, the likelihood that they simply represent “Stone Age pornography” seems remote. Instead, as numerous researchers have argued, they more likely reflect concerns over fertility and childbearing (Eliade, 1958; Wymer, 1982).

### **Deep Cave Ecstatic Initiation Rituals into Secret Societies**

Finally, the stunning deep cave sites of the Upper Paleolithic, replete with their elaborate artwork and other artifacts strongly indicate the presence of secret societies associated with powerful lineages within the complex hunter-gatherer world. Hayden (2003, p. 129) notes how areas richest with Upper Paleolithic cave sites, artifacts, and other remains such as parts of Ukraine, southwest France, and northern Italy and Spain, are all areas where migratory bottlenecks and other geographic features would have produced high biomass densities. This suggests that the people living there would have been complex, not generalized, hunter-gatherers. At many of the deep cave sites associated with these areas, 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 ecstatic rituals of initiation into elite societies associated with

powerful family lineages. Other evidence from these caves offers further support for this notion.

First, evidence of regular use such as torches, fires, tools or food remains are rare, suggesting that these sites were occupied only sporadically, presumably for ritual purposes (Clottes, 1992; Beaune, 1995). Second, 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). Third, the animals depicted in many of these sites are not ones critical for food, but instead appear to have more symbolic importance as representations of power (mammoth), ferocity (lion) or strength (bison, Bahn & Vertut, 1988; see also Hayden, 2003 p 143-145 for summary). Furthermore, some of the animals depicted are purely mythic such as the long-horned horselike creature of Lascaux. Dowson and Porr (1999) have argued that the specific animals shown and their positioning reflect shamanic themes. Finally, along with the strange animals, many caves sites also have bizarre symbols that Lewis-Williams and Dowson (1988) have shown bear a close association with the entopic visual experiences that occur during periods of stress, sensory deprivation, and/or trance experiences.

### **Later Religion: Elites Harness the Supernatural**

The critical turn that religion takes during the complex hunter-gatherer stage is that of envisioning more fully the supernatural realm and its relationship to earthly life. Religion moved from its earlier focus on social bonding to a supernatural validation of powerful resource-holding lineages. The archeological evidence indicating ancestor-worship, concerns over fertility, and deep cave ecstatic initiation rituals represents a clear break from the behavioral patterns of nonhuman primates. While notions of supernatural agency cannot be ruled out during the generalized hunter-gatherer stage, it is only at this stage that evidence for it becomes compelling. The transition from egalitarian generalized hunter-gatherers to more economically stratified complex hunter-gatherers brought with it a need to “justify” social inequalities. Elites sought justification for their status and power through the supernatural. Powerful ancestors guarded and bequeathed resource rich territories to extant family members. The resources of these territories benefited the entire tribe. It was therefore in the interests of the entire tribe that the stewardship, “generosity,” and continued fecundity of these powerful family lineages be preserved. An important aspect of that preservation involved closed rituals where new members of the elite lineage were initiated and where the secrets and power of the ancestors and supernatural were revealed to them. The ancestors were envisioned key causal agents within the supernatural realm who provided the resources necessary for the tribe to prosper.

If the primary motivating force behind earlier forms of religion were the social emotions and group-level commitments arising from our primate heritage, then in the complex hunter-gatherer stage, uniquely human motivations have achieved prominence. Supernatural agency, in the form of powerful ancestors and religious rituals designed to maintain their good favor and promote fertility, emerged as a critical aspect of religion. The grave goods and elaborate burials associated with Upper Paleolithic sites may also bespeak of a heightened awareness of death and the burgeoning hope of an afterlife. The social bonding function of religion certainly did not dissipate in the complex hunter-gatherer stage. It was instead, augmented by a clearer vision of the supernatural and a

more gripping appreciation of death. These additions have no nonhuman primate analogue. Humanity embarked down unprecedented religious path.

### **Stage 3: Neolithic Domestication Stage**

The critical change that ushered in the Neolithic era (9,000 – 3,000 BCE) involved technological advances that permitted the domestication of food production (Hayden, 2003, p. 168-169). Unlike the complex hunter-gatherers of the Upper Paleolithic, many societies of the Neolithic began to cultivate, raise, and harvest their own food products along with procuring it from naturally-occurring sources. Controlled food production allows for the accumulation of even greater surpluses than what were available to complex hunter-gatherers. This is so because increases in efficiency and effort produce continued gains in return, whereas when exploiting a naturally-occurring resource, exhaustion of the local population eventually thwarts rewards from increasing effort or efficiency in harvesting. The impact of domestication is an even more complex and stratified social structure.

Following Bender (1975; 1978; 1985), Hayden argues that the catalyst for this transition was competitive feasting – that is, the use of surplus resources for community and intercommunity feasts and celebrations in order to heighten prestige for oneself, one's family or clan, and to form alliances with neighboring tribes. Feasts were essentially show-off behaviors from which the host gained friends, strategic alliances, power, and reproductive success. Those who exerted greater control over food production could accumulate greater surpluses and could hold more elaborate and more frequent feasts. Socially and economically, the affects of domestication were to further solidify and exaggerate the social inequalities and complexities emergent in the complex hunter-gatherer stage. Likewise, religion did not dramatically change, but instead diverged further along three trajectories already in place: Elite religion, public religion, and domestic religion.

Among the elites who controlled food production, the ancestors emerged as even more important supernatural players. They were the ultimate owners of the land and guarantors of its fertility. Therefore it is not surprising that even more elaborate burial sites and evidence of ancestor worship can be found in Neolithic remains. For example, Lepinski Vir (dated at between 8800-7800 ya) 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 & Babovic, 1983; Srejovic & Letica, 1978; see also Hayden, 2003 p. 159-164). The small size of the structures and the scarcity of domestic refuse suggests that Lipinski Vir was not a permanent residence, but instead was used as an intermittent religious site where feasts, rituals, and veneration of the dead took place. Analogous sacred sites honoring the dead are found among Northwest Coast Native Americans, Maya Indians of Central American, and Melanesian Islanders (Hayden, 2003, p. 162). Similar ritually designed grave sites have been found at San'nai Maruyama, in Japan (Iizuka, 1995), in Skateholm and Bredasten in Scandinavia, (M. Larsson, 1985/86; L. Larsson, 1987/88), and most significantly at the Neolithic site of Catal Huyuk in ancient Anatolia (central Turkey, Mellaart, 1967).

At Catal Huyuk, not only is there substantial evidence of ancestral shrines, but also of dramatic social and economic inequalities and of large-scale feasting, very likely feasting associated with funerals (Dietler, 2001; Wason, 1994). Sites such as Lepinski Vir and Catal Huyuk indicate the emergence of a dual purpose for ancestor worship as both elite and popular religious forms. As elite religion, the ancestors of particular, powerful family lineages were offered special shrines, rites, and rituals (often secret rituals open only to elite members) performed to ensure the continued fertility of the land. As popular religion, feasts (often on the occasion of the death of a lineage member) and other celebrations would typically be open to and shared with all tribal members and even to those of adjacent communities. Hayden (2003, p. 230-236, 246-247) contends that the great megalithic structures such as Avebury and Stonehenge are best understood as monuments to the dead and elite feasting sites that operated in parallel with less elaborate “public” sites (e.g. Woodhenge).

By the Neolithic then, religion had two distinct aspects recognizable in the archeological record: (1) the worship of a restricted set of common, powerful ancestors who warranted special monuments and through whom earthly “elites” maintained their prestige and, (2) public feasts and ceremonies venerating those ancestors, sponsored by the elites, but for the common benefit. A third aspect of religion, household or domestic cults, was likely present as well, however; little of it would be expected to remain in the archeological record. Among traditional societies, worship of familial ancestors is universal (Lee & Daly, 1999; Parrinder, 1976). It seems reasonable to expect that in addition to worshipping common tribal ancestors, our Neolithic forbearers paid homage to more personal, family ancestors via simple hearth shrines.

The divisions established in the Neolithic set the framework for classic paganism. The Olympian pantheon represented deities of the “elite” warrior class (Bryant, 1996; Nilsson, 1940). These deities warranted specific shrines with exclusive cultic practices (e.g. the oracle at Delphi). However, festivals in their honor were typically sponsored by local aristocrats, were open to all, and served as an important community-building activity. The common folk had their own set of ancestors and other household deities to whom they offer sacrifice and petitioned for protection, good fortune, and fertility.

It is also interesting to note how the Neolithic religious trinity connects to the various aspects of the religious mind. As political and social authority became increasingly centralized in an elite class and then even more so in chiefs and kings, increasingly the elite gods became a symbol of unity for the tribe or nation (Hayden, 2003, p. 242). To serve this unifying function and to further bolster elite social control, supernatural agency needed to be even more clearly articulated and codified (e.g. specific rules for reading divine signs). The role of the gods and their behavioral and sacrificial demands increasingly became the domain of a priestly class of religious specialists who helped to provide a supernatural validation for elite authority. Ritual access to the supernatural and the ecstatic experience of the divine became evermore restricted to specialists who served as intermediaries between the people and the gods. As ritual and ecstatic states lost their social binding function, this function was replaced by elite sponsored religious festivals and feasting. In effect a trade-off was made. The masses accepted the authority of religious specialists and their “private” rituals as the proper channel to the divine, and in turn were granted elite sponsored religious feasts and festivals as social unifying activities. Furthermore, though subordinate to the elite gods,

common folks continued to worship their familial and household deities who helped to assuage their existential concerns over the uncertainties of life. The Neolithic religious divisions, which in many ways continue to this day, reflect the psychological foundations from which religion emerged in the human mind.

### **Conclusion: The Evolution of Religion and the Religious Mind**

The architecture of the religious mind suggests that psychologically religion must do certain things: (1) it must serve as a social binding mechanism, (2) it must provide causal explanations (including supernatural explanations) and, (3) it must address existential concerns. Overlaying these functions is the ecstatic state which appears to aid in all of them by providing validation for the supernatural and promoting social bonding. Connecting these religious mental attributes with the archeological and anthropological evidence pertaining to the evolution of religion suggests the following: (1) the earliest forms of religion were likely focused on the promotion of social cohesion. The ecstatic state, voluntarily achieved using intra- and intercommunity rituals, heightened social emotions which in turn helped to solidify social bonds. The fact that ecstatic states, social emotions, and the ritual behaviors used to establish and re-establish social bonds are all present (in some manner or form) in our primate cousins adds further credence to the primacy of this religious form among our ancestors.

(2) As human societies became more complex and stratified, social elites sought to more clearly define the supernatural in ways that served their interests. Their ancestors were seen as “causal agents” whose demands (including the maintenance of the social order) must be met for the continued fertility and prosperity of the entire tribe. Ecstatic states and ritual access to the supernatural became more restricted to an elite class of religious specialists whose overarching social view was conservative. The social bonding function of religion was shifted away from egalitarian rituals to elite sponsored public feasts and ceremonies. The existential concerns of commoners were also shifted onto more localized and subordinate domestic and household cuts. The interplay of religious evolution and mind reveals that even as religion and society evolve, the basic psychological functions of religion remain intact only expressed in different modes.

### **References**

- Alexander, R. (1989). Evolution of the human psyche. In P. Mellars & C. Stringer (Ed.), *The human revolution* (pp. 455-513). Edinburgh: University of Edinburgh Press.
- Argyle, M. (2000). *Psychology and religion: An introduction*. London: Routledge.
- Aronson, E. & Mills, J. (1959). The effect of severity of initiation on liking for a group. *Journal of Abnormal and Social Psychology*, 59, 177-181.
- Atran, S. (2002). *In gods we trust*. Oxford: Oxford University Press.
- Baffier, D., & Girard, M. (1998). *Les cavernes D’Arcy-sur-Cure*. Paris: La Maison des Roches
- Bahn, P. & Vertut, J. (1988). *Images of the Ice Age*. Leicester: Windward.
- Baldwin, D. A., Baird, J. A., Saylor, M. M., & Clark, M. A. (2001). Infants parse dynamic action. *Child Development*, 72, 708-717.
- Barrett, K. C. (1995). A functionalist approach to shame and guilt. In J. P. Tangney & K. W. Fischer (Eds.), *Self-conscious emotions: The psychology of shame, guilt, embarrassment and pride* (pp. 25-63). New York: The Guilford Press.
- Batson, C. D., Schoenrade, P. & Ventis, W. L. (1993). *Religion and the individual*. New

- York: Oxford University Press.
- Beaune, S. (1995). *Les Hommes au temps de Lascaux*. Paris: Hachette.
- Bednarik, R. (1995). Concept-mediated marking in the Lower Paleolithic. *Current Anthropology*, 36, 605-634.
- Bednarik, R. (1994). Art origins. *Anthropos*, 89, 169-180.
- Bender, B. (1975). *Farming in prehistory*. London: John Baker.
- Bender, B. (1978). Gatherer-hunter to farmer: A social perspective. *World Archeology*, 10, 204-222.
- Bender, B. (1985). Emergent tribal formations in the American mid-continent. *American Antiquity*, 50, 52-62.
- Bingham, P. M. (1999). Human uniqueness: A general theory. *The Quarterly Review of Biology*, 74, 133-169.
- Bloom, H. (1992). *The American religion*. New York: Simon and Schuster.
- Boyer, P. (2001). *Religion explained*. New York: Basic Books.
- Bryant, J.M. (1996). *Moral codes and social structure in ancient Greece*. Albany, NY: SUNY Press.
- Byrne, R.W., & Whiten, A. (1991). Tactical deception in primates: The 1990 database. *Primate Report*, 27, 1-101.
- Campbell, J. (1983). *The way of animal powers* (vol. 1): *Historical atlas of world mythology*. San Francisco: Harper & Row.
- Clottes, J. (1992). L'archeologie des grottes ornees. *La Recherche*, 239, 23, 52-61.
- Clottes, J. & Lewis-Williams, D. (1998). *The shamans of prehistory: Trance and magic in painted caves*. New York: Abrams Press.
- Conklin, B. A. (2001). *Consuming Grief: Compassionate Cannibalism in an Amazonian Society*. Austin, TX: University of Texas Press.
- Defleur, A., Dutour, O., Valladas, H., & Vandermeersch, V. (1993). Cannibals among the Neanderthals. *Nature*, 362, 214.
- Defleur, A., White, T., Valensi, P., Slimak, L., & Cregut-Bonnouere, E. (1999). Neanderthal cannibalism at Moula-Guercy, Ardeche, France. *Science*, 286, 128-131.
- de Waal, F. B. M. (1996). *Good natured*. Cambridge, MA: Harvard University Press.
- de Waal, F. B. M., & Lanting, F. (1997). *Bonobo: The forgotten ape*. Berkeley: University of California Press.
- Dickson, B. (1990). *The dawn of belief*. Tucson: University of Arizona Press.
- Dietler, M. (2001). Theorizing the feast: Rituals of consumption, commensural politics, and power in African contexts. In M. Dietler & B. Hayden (Eds.), *Feasts* (pp. 65-114). Washington, D.C.: Smithsonian Institution Press.
- Dowson, T. & Porr, M. (1999). Special objects – special creatures.: Shamanic imagery and Aurignacian art. In N. Price (Ed.), *The archaeology of shamanism* (pp. 165-177). London: Routledge.
- Dugatkin, L. A. (2001). Subjective commitment in nonhumans: What should we be looking for, and where should we be looking? In R. Nesse (Ed.), *Evolution and the capacity for commitment* (pp. 120-137). New York: Russell Sage Foundation.
- Dunbar, R. (1996). *Grooming, gossip, and the evolution of language*. Cambridge, MA: Harvard University Press.
- Eliade, M. (1958). *Patterns in comparative religion*. London: Sheed and Ward.

- Farizy, C. (1990). Du Mousterien au Chatelperronien a Arcy-sur-Cure. *Memoires du Musee de Prehistoire, Ile-de-France*, 3, 281-289.
- Farthing, G. W. (1992). *The psychology of consciousness*. New York: Prentice-Hall.
- Fehr, E. & Gächter, S. (2002). Altruistic punishment in humans. *Nature*, 415, 137 – 140.
- Fehr, E. & Tyran, J.-R. (1996). Institutions and reciprocal fairness. *Nordic Journal of Political Economy*, 67, 133-44.
- Feuerbach, L. 1972(1843). *The fiery book: Selected writings of Ludwig Feuerbach*. Garden City, NY: Anchor Books.
- Gallup, G. (1970). Chimpanzee self-recognition. *Science*, 167, 86-87.
- Gallup, G. (1982). Self-awareness and the emergence of mind in primates. *American Journal of Primatology*, 2, 237-248.
- Geertz, C. (1966). Religion as a cultural system. In M. Banton (Ed.), *Anthropological approaches to the study of religion* (pp. 1-46). London: Tavistock.
- Gazzaniga, M. S. (1995). Consciousness and the cerebral hemispheres. In M. S. Gazzaniga, (Ed.), *The cognitive neurosciences* (pp. 1391-1399). Cambridge, MA: MIT Press.
- Gerard, H. & Mathewson, G. (1966). The effect of severity of initiation on liking for a group: A replication. *Journal of Experimental Social Psychology*, 2, 278-287.
- Goodall, J. (1986). *The chimpanzees of Gombe*. Cambridge: Harvard University Press.
- Greenberg, J., Pyszczynski, T., Solomon, S., Rosenblatt, A., Veeder, M., Kirkland, S., & Lyon, D. (1990). Evidence for terror management theory II: The effects of mortality salience on reactions to those who threaten or bolster cultural worldviews. *Journal of Personality and Social Psychology*, 58, 308-318.
- Hamilton, W. D. (1964). The genetical evolution of social behavior. I and II. *Journal of Theoretical Biology*, 7, 1–52.
- Hare, B., Call, J., Tomasello, M. (2001). Do chimpanzees know what conspecifics know? *Animal Behaviour*, 61, 139-151.
- Hayden, B. (2003). *Shamans, sorcerers, and saints*. Washington, D.C.: Smithsonian Institution Books.
- Hinde, R. A. (1999). *Why gods persist*. London: Routledge Press.
- Hogg, G. (1966). *Cannibalism and human sacrifice*. New York: Citadel Press.
- Hunt, G. R. (1996). Manufacture of hook-tools by New Caledonian crows. *Nature*, 379, 249-251.
- Hutton, R. (1991). *The pagan religions of the ancient British Isles*. Oxford: Blackwell Press.
- Iizuka, T. (1995). *The kingdom of earth and wood: The San'nai Maruyama site*. Jomon Film Production Company, Japan.
- Irons, W. (1996). Morality, religion and human evolution. In W. Mark Richardson, & W. J. Wildman (Eds.), *Religion and science: History, method and dialogue* (pp. 375-399). New York: Routledge.
- Irons, W. (2001). Religion as a hard-to-fake sign of commitment. In R. Nesse (Ed.), *Evolution and the capacity for commitment* (pp. 292-309). New York: Russell Sage Foundation.
- James, W. (1902/1961). *Varieties of religious experience*. New York: MacMillan.
- Klima, B. (1988). A triple burial from the Upper Paleolithic of Dolni Vestonice, Czechoslovakia. *Journal of Human Evolution*, 16, 831-835.



- Knight, C. D., Power, C., & Watts, I. (1995). The human symbolic revolution: A Darwinian account. *Cambridge Archeological Journal*, 5, 75-114.
- Kulik, J. A. & Mahler, H. I. M. (1989). Stress and affiliation in a hospital setting: Preoperative roommate preference. *Personality and Social Psychology Bulletin*, 15, 183-193.
- Kulik, J. A., Mahler, H. I. M., & Earnest, A. (1994). Social comparison and affiliation under threat: Going beyond the affiliate-choice paradigm. *Journal of Personality and Social Psychology*, 66, 301-309.
- Larsson, L. (1987/88). A construction for ceremonial activities from the late Mesolithic. *Archeological Institute Papers*, 7, University of Lund. Lund, Sweden.
- Larsson, M. (1985/86). Bredasten: An early Ertelolle site with a dwelling structure in south Scania. *Archeological Institute Papers*, 6, University of Lund. Lund, Sweden.
- Lee, R. B., & Daly, R. (1999). Introduction: Foragers and others. In R. B. Lee and R. Daly (Eds.), *The Cambridge encyclopedia of hunters and gatherers* (pp. 1-22). Cambridge: Cambridge University Press.
- Leroi-Gourhan, A. (1968). The evolution of Paleolithic art. *Scientific American*, 218, 58-70.
- Lewin, R. (1998). *Principles of human evolution*. London: Blackwell Science.
- Lewis-Williams, J. D. & Dowson, T. (1988). The signs of the times: Entopic phenomena in Upper Paleolithic art. *Current Anthropology*, 29, 201-245.
- Lorblancher, M. (1999). *La Naissance de L'Art*. Paris: Editions Errance.
- Macphail, E. M. (1998). *The evolution of consciousness*. Oxford: Oxford University Press.
- Malinowski, B. 1961 (1922). *Argonauts of the western Pacific*. New York: Dutton.
- Mcbrearty, S. & Brooks, A. (2000). The revolution that wasn't: A new interpretation of the origin of human behavior. *Journal of Human Evolution*, 39, 453-463.
- Mellaart, J. (1967). *Catal Huyuk: A Neolithic town in Anatolia*. London: Thames & Hudson.
- Meltzoff, A. (1995). Understanding the intentions of others: Re-enactment of intended acts by 18-month-old children. *Developmental Psychology*, 24, 838-850.
- Mills, J. & Mintz, P. (1972). Effect of unexplained arousal on affiliation. *Journal of Personality and Social Psychology*, 24, 11-13.
- Nilsson, M. (1940). *Greek folk religion*. Philadelphia: University of Philadelphia Press.
- O'Connell, S. O. & Dunbar, R. I. M. (2005). The perception of causality in chimpanzees (*Pan spp.*). *Animal Cognition*, 8, 60-66.
- Owens, D. & Hayden, B. (1997). Prehistoric rites of passage: A comparative study of Transegalitarian hunter-gatherers. *Journal of Anthropological Archaeology*, 16, 121-161.
- Parker, S. T. (1998). A social selection model for the evolution and adaptive significance of self-conscious emotions. In M. Ferrari, & R. J. Sternberg, (Eds.), *Self-awareness: Its nature and development* (pp. 108-134). New York: Guilford Press.
- Parrinder, G. (1976). *African traditional religions*. Westport, CT: Greenwood Press.
- Povinelli, D. J. & Eddy, T. J. (1996). What young chimpanzees know about seeing.

- Monographs of the Society for Research in Child Development*, 61, (2, serial No. 247).
- Povinelli, D. J., & Prince, C. G. (1998). When self met other. In M. Ferrari, & R. J. Sternberg, (Eds.), *Self-awareness: Its nature and development* (pp. 37-107). New York: Guilford Press.
- Power, C. (1998). Old wives' tales: The gossip hypothesis and the reliability of cheap signals. In J. R. Hurford, M. Studdert-Kennedy, & C. Knight (Eds.), *Approaches to the evolution of language: Social and cognitive bases* (pp. 111-129). Cambridge: Cambridge University Press.
- Power, C., & Watts, I. (1996). Female strategies and collective behavior. The archeology of earliest *Homo sapiens sapiens*. In J. Steele and S. Shennan (Eds.), *The archeology of human ancestry. Power, sex and tradition* (pp. 306-330). London: Routledge.
- Premack, D. (1976). *Intelligence in ape and man*. Hillsdale, NJ: Erlbaum
- Premack, D., & Premack, A.J. (1994). Levels of causal understanding in chimpanzees and children. *Cognition*, 50, 347-362.
- Price, T. D. & Brown, J. A. (1985). *Prehistoric hunter-gatherers: The emergence of cultural complexity*. Orlando, FL: Academic Press.
- Prince, R. (1982). The amino acid alphabet in the brain. *Ethnos*, 104, 303-16.
- Ramachandran, V. S. & Blakeslee, S. (1998). *Phantoms in the brain*. New York: Morrow.
- Roberts, W. A. (2002). Are animals stuck in time? *Psychological Bulletin*, 128, 473-489.
- Rouzaud, F, Soulier, M., & Lignereux, Y. (1996). La Grotte de Bruniquel. *Spelunca*, 60, 28-34.
- Sanday, P. R. (1986). *Divine hunger*. Cambridge: Cambridge University Press.
- Schachter, S. (1959). *The psychology of affiliation*. Palo Alto, CA: Stanford University Press.
- Shostak, M. (1981). *Nisa: The life and words of a !Kung woman*. Cambridge, MA: Harvard University Press.
- Soffer, O. (1985). *The Upper Paleolithic of the central Russian plain*. Orlando, FL: Academic Press.
- Sosis, R. (2000). Religion and intragroup cooperation: Preliminary results of a comparative analysis of Utopian communities. *Cross-Cultural Research*, 34, 71-88.
- Srejovic, D. & Babovic, L. (1983). *Umetnost Lepenskog Vira*. Belgrade: Izdavachi Zavod.
- Srejovic, D. & Letica, Z. (1978). Vlasac: A Mesolithic settlement in the Iron Gates. *Monographs of the Serbian Academy of Sciences and Arts*, 62, *Department of Historical Sciences*, 5, Belgrade.
- Tomasello, M. & Call, J. (1997). *Primate cognition*. New York: Oxford University Press.
- Trivers, R. L. (1985). *Social evolution*. Merlo Park, CA: Benjamin/Cummings.
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, 46, 35-57.
- Tulving, E. (1983). *Elements of episodic memory*. Oxford: Oxford University Press.
- Tulving, E. & Lepage, M. (2001). Where in the brain is the awareness of one's past? In

- D. L. Schacter & E. Scarry (Eds.), *Memory, brain, and belief* (pps. 208-228). Cambridge, MA: Harvard University Press.
- van Roosmalen, M.G.M., & Klein, L.L. (1988). The spider monkeys, genus *Ateles*. In R. A. Mittermeier, A. B. Rylands, A. F. Coimbra-Filho, & G. A. B. da Fonesca, (Eds.), *Ecology and Behavior of Neotropic Primates*, (pps. 445-537), Washington, D.C.: World Wildlife Fund.
- Wason, P. (1994). *The archeology of rank*. Cambridge: Cambridge University Press.
- Weidenreich, F. (1943). *The skull of Sinanthropus Pekinensis*. Pehpei, Chungking: Geological Survey of China.
- White, R. (1993). Technological and social dimensions of “Aurignacian Age” body ornaments across Europe. In H. Knecht, A. Pike-Tay, and R. White (Eds.), *Before Lascaux* (pp. 277-99). Boca Raton, FL: CRC Press.
- White, T. D. (1986). Cut marks on the Bodo Cranium: A case of prehistoric defleshing. *American Journal of Physical Anthropology*, 69, 503-509.
- Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representational and constraining function of wrong beliefs in young children’s understanding of deception. *Cognition*, 13, 103-128.
- Wymer, J. (1982). *The Paleolithic Age*. London: Croom Helm.