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## *The Epistemology and Technologies of Shamanic States of Consciousness*

*Shamanism can be described as a group of techniques by which its practitioners enter the 'spirit world', purportedly obtaining information that is used to help and to heal members of their social group. The shamans' epistemology, or ways of knowing, depended on deliberately altering their conscious state and/or heightening their perception to contact spiritual entities in 'upper worlds', 'lower worlds' and 'middle earth' (i.e., ordinary reality). For the shaman, the totality of inner and outer reality was fundamentally an immense signal system, and shamanic states of consciousness were the first steps toward deciphering this signal system. Homo sapiens sapiens was probably unique among early humans in the ability to symbolize, mythologize and, eventually, to shamanize. This species' eventual domination may have been due to its ability to take sensorimotor activity and use it as a bridge to produce narratives that facilitated human survival. Shamanic technologies, essential for the production and performance of myths and other narratives, interacted with shamanic epistemology, reinforcing its basic assumptions about reality.*

The brain is a machine assembled not to understand itself, but to survive.  
(E.O. Wilson, 1998)

Although the term 'shaman' is of uncertain derivation, it is often traced to the language of the Tungus reindeer herders of Siberia where the word *šaman* translates into 'one who is excited, moved, or raised' (Casanowicz, 1924; Lewis, 1990, pp. 10–12). An alternative translation for the Tungus word is 'inner heat', and an alternative etymology is the Sanskrit word *saman* or 'song' (Hoppal, 1987). Each of these terms applies to the activities of shamans, past and present, who enter what is often described as 'an ecstatic state' in order to engage in spiritual practices that benefit their community (pp. 91–2). The adaptive character of shamanism is confirmed by its ubiquitous appearance around the world, not only in hunter-gatherer and fishing societies, but in centralized societies as well.

Much of the behaviour of other animals is instinctive, and their experience modifies these complex, inborn patterns of behaviour. However, drives and biological propensities, not innate behaviour patterns, characterize humans. Non-human animals, especially gorillas and chimpanzees, probably compare environmental stimuli to the memory images from past interactions. Humans fall on this continuum as well, and the satisfaction of their vital needs was once highly dependent on their ability to use these images to produce the tools and procedures appropriate for drive satisfaction. Eventually, these procedures included a variety of social interactions including speech and ritual behaviour (Guryev, 1990, p. 124; V. Turner, 1968).

Ritual afforded an opportunity to express the community's conceptions of reality in a social setting. Ritual, a step-by-step social performance, is the key to the structure of a group's mythology, or worldview. In shamanic societies especially, ritual is a stylized technology, one whose symbols and metaphors may well trigger healing, relieve suffering, and provide a link between the ordinary world and those realms purportedly traversed by the shaman (Krippner, 1993; E. Turner, 1992, p. 14; V. Turner, 1968).

### **The *Veladas* of María Sabina**

Shamanic rituals were essential to the career of the Mazatec Indian María Sabina, who lived in the state of Oaxaca, Mexico. Born about 1894, María Sabina led a life of severe hardship. Her father died when she was quite young, and her first husband abused her terribly. After his death, she married again but her second husband died when she was in her 40s. Since childhood, María Sabina had been interested in herbs and worked for a period of time as a *curandera* or herbalist. Later, she felt that she had been called to become a *sabía* (i.e., 'one who knows') and ingested psilocybin mushrooms as a way of 'knowing' the condition and treatment of her clients. During my interviews with her in 1980, doña María told me that Jesus Christ and other spiritual entities came to her and her client during the *veladas* (evening mushroom ceremonies), bringing information about her client's problem and its resolution.

As a *sabía* or shamanic healer, María Sabina manifested considerable control during the *veladas*, chanting liturgies containing an overlay of Roman Catholic imagery which cloaked the odes used by the Indian priests who had been overthrown by the Spaniards in the 1520s. The Spanish Inquisition outlawed the *veladas*, but the Mazatecs took them underground for four centuries. One night, María Sabina dreamed that it was her mission to share this sacred knowledge with the world. Soon after this dream, on June 29, 1955, a group of U.S. investigators headed by R. Gordon Wasson arrived. Eventually, doña María and the psilocybin mushrooms were featured in *Life* magazine, and the field of ethnomycology was born (Estrada, 1981; Wasson, 1981). Doña María's reported dream is unique for several reasons: it ran counter to the attempt of male elders to keep their practices secret, and its egalitarian and universal motive violated the political power of her

society's male hierarchy. She paid dearly for this action; her grocery store was burned to the ground and her son was murdered.

María Sabina's worldview is expressed in her chants; in one, she apparently alludes to her shamanic journeys:

I am a woman who flies.  
 I am the sacred eagle woman, [the mushroom] says;  
 I am the Lord eagle woman;  
 I am the lady who swims;  
 Because I can swim in the immense,  
 Because I can swim in all forms.  
 I am the shooting star woman,  
 I am the shooting star woman beneath the water,  
 I am the lady doll,  
 I am the sacred clown,  
 Because I can swim,  
 Because I can fly (Estrada, 1981, abridged, pp. 93-4, 96).

Doña María's feelings of unity with nature and with the spirit world is revealed by another set of chants; the lyrics also portray her active role in attaining knowledge:

I have the heart of the Virgin,  
 I have the heart of Christ,  
 I have the heart of the Father,  
 I have the heart of the Old One,  
 It's that I have the same soul,  
 The same heart as the saint, as the saintess;  
 I am a spirit woman,  
 A woman of good words, good breath, good saliva,  
 I am the little woman of the great expanse of the waters,  
 I am the little woman of the expanse of the divine sea.  
 I am a woman who looks into the insides of things,  
 A woman who investigates, Holy Father,  
 I am a woman born, I am a child born,  
 I am a woman fallen into the world (pp. 107, 129-30).

In other words, María Sabina employed an investigatory way of knowing; she 'looks into the insides of things'. She, and other shamans, learn from 'the spirits', 'the waters', and 'the divine sea'. Tradition and holy writ might provide source material for the shaman, but it is his or her 'heart' and 'soul' that are the final arbiters of knowledge.

### **Shamanism as a Biologically Derived Specialization**

Winkelman (1997) proposes that María Sabina and other shamans represent a 'biologically derived' human specialization, and that these potentials are actualized through social adaptations. This proposition could be used to explain the worldwide appearance of shamans as well as the fundamental role of altered conscious states and/or heightened perception in shamanic healing and divination

practices. An example of divination has been given by Lerche (2000). In his quest for the lost tribes of the Peruvian Chachapoya (or 'cloud people'), he consulted a shaman who drew on the power of ritual objects. The shaman had a vision that some of the tombs remained unharmed and, soon after the consultation, Lerche detected a mummy bundle in a tomb high on a cliff (p. 68).

These potentials can be described as 'neurognostic' because they involve neural networks that provide the biological substrate for ways of knowing (Laughlin *et al.*, 1990), i.e., epistemology. I would add that these neurognostic potentials are not the exclusive domain of shamans; primordial humans performed healing and divinatory functions themselves before specialization established a hierarchy. Evidence for this position can be found in fairly egalitarian tribal societies such as the !Kung of southwestern Africa where about half the males and a sizable number of females shamanize, producing the 'boiling energy' (i.e., sweat) used in their healing rituals (Katz, 1982).

Neurognostic potentials provide the basis for those forms of perception, cognition, and affect that are structured by the organism's neurological systems. They are probably reflected in what Jungians call 'archetypes', which can be conceptualized as the predispositions that provide organizing principles for the basic modes of consciousness and elementary behaviour patterns, including the intuitive capacity to initiate, control, and mediate everyday behaviour.

Stevens (1982) suggests that 'from the viewpoint of modern neurology, Jung's work stands as a brilliant vindication of . . . the value of intuitive knowledge' (pp. 273-4). When ritualized shamanic performance is described as 'archetypal', the activity reflects biologically based modes of consciousness, a replacement of the ordinary waking state through discharge patterns that produce interhemispheric synchronization and coherence, limbic-cortex integration, and integral discharges that synthesize cognition, affect, and behaviour (Winkelman, 1992). Shweder (1979) found that Zinacanteco shamans in Mexico possess cognitive capacities that distinguish them from non-shamans such as having available a number of constructive categories, imposing these forms onto ambiguous situations; these integrative capacities may have facilitated the development of shamanic epistemologies over the millennia.

A variety of procedures, agents, and other technologies are available to evoke limbic system slow wave discharges that synchronize the frontal cortex (Mandell, 1980). In addition, shamans can be characterized as 'fantasy-prone' (Wilson & Barber, 1983), endowed with capacities, genetic to some degree, that facilitate their use of imaginative processes. Fantasy-proneness exists on a continuum; most humans engage in fantasy, imagination, and play (especially 'pretending' and 'role-playing') periodically, but shamans draw upon this trait for their specialization.

Many of the early shamans may not have been dependent on transient consciousness alteration but manifested a heightened perceptual style that was part of their everyday state of consciousness. Berman (2000) suggests that 'heightened awareness' may be a more accurate description of shamanic consciousness than 'altered state' because their intense experience of the natural world is described

by them in such terms as 'things often seem to blaze' (p. 30). Paradoxically, shamans are characterized both by an acute perception of their environment and by imaginative fantasy. These traits (the ability to construct categories, the potential for pretending and role-playing, and the capacity to experience the natural world vividly) gave shamans an edge over peers who had simply embraced life as it presented itself, without the filters of myth or ritual (Berman, 2000, p. 81).

All of these traits may be related to the evolution of the human brain, namely the development of specialized subsystems that are activated during shifts in consciousness. The hallmark of cortical evolution is not the ever-increasing sophistication of specialized cortical circuitry but an increasing representational flexibility that allows environmental factors to shape the human brain's structure and function (Gazzaniga, 1994; Quartz & Sejnowski, 1997). Pinker (1997) suggests that the 'mind' is made up of many modules, each honed by aeons of evolution, and shamans may have learned to integrate these modules (Winkelman, 2000, p. 7). If so, shamanic technologies represent the initial institutionalized practices for this integration, both through shifts in consciousness and community bonding rituals (Winkelman, 1997). These practices became codified in the form of myth, ritual, and ceremony, providing for social solidarity and specialization.

McClenon (1997) hypothesizes that the benefits of shamanic states of consciousness elicited an evolutionary increase in genes that would expedite this condition. However, all cultural changes in the past 90,000 to 100,000 years of *homo sapiens sapiens* (i.e., modern humans) have been environmental, not genetic (DeMause, 1998). Therefore, this essay takes the position that once *homo sapiens sapiens* arrived on the scene, and once shamanism developed as a societal specialization, the contributions of shamanism to the evolution of human consciousness took on socio-cultural roots that built upon humanity's biological (i.e., neurognostic) groundings.

The initiation and direction of thought and behaviour owes as much to social construction as it does to biology (Rychlak, 1997, p. 143). Furthermore, all human societies contain inventive people but some of them provide more unusual materials and more favorable conditions for utilizing new technologies than do others in the same environment (Diamond, 1997, p. 408). It is likely that spiritual activities originally involved the entire clan, but changing social and economic conditions brought about shamanic specialization and, later, a priesthood (Anisimov, 1963) and social inequality (Berman, 2000, p. 82).

### Shamanic Technologies

The oral traditions that preserved the myths that structured a culture's identity and worldview may not have been originated by shamans, but eventually were passed down by them (Wiercinski, 1989). For example, Marfa Sabina and her fellow shamans preserved, in their chants and rituals, Mazatec mythologies for more than four centuries, preserving their cultural identity in the face of Spanish oppression. To facilitate this societal function, many shamans developed

techniques to assist the elicitation and movement of 'inner' heat, to enable their shamanic journeys, and to facilitate their contact with the 'upper' and 'lower' worlds. This technology allowed them to encounter spirits, ancestors, animal totems, and other resources that had found their way into mythological songs and stories.

Epistemology is concerned with the nature, characteristics and processes of knowledge, and in this essay I am suggesting that shamanic epistemology drew upon perceptual, cognitive, affective and somatic ways of knowing that assisted early humans to find their way through an often unpredictable, sometimes hostile, series of environmental challenges. Not only did early humans have to become aware of potentially dangerous environmental objects and activities, they needed to have explanatory stories (enacted as mythic rituals) at their disposal to navigate through the contingencies of daily encounters and challenges. The acute perceptual abilities of shamans, in combination with their intuition and imagination, met their societies' needs.

Eliade (1972/1951) writes of the 'technologies of the sacred', and, for me, shamanism is most accurately defined as a collection of these technologies. Shamanism comprises a group of techniques by which practitioners deliberately alter or heighten their conscious awareness to enter the so-called 'spirit world', accessing material that they use to help and to heal members of the social group that has acknowledged their shamanic status.<sup>1</sup> In psychological terms, shamans are socially designated practitioners who claim to self-regulate their psychological functions to obtain information unavailable to other members of their social group. Shamans were probably humanity's original specialists, combining the roles of healers, storytellers, weather forecasters, performing artists, ritualists, and magicians. A chief or chieftainess directed the tribe's political, civic, and military life, and the shamans were in charge of a tribe's spiritual life, but occasionally these two roles converged in a single, remarkable individual.

Mythological worldviews arise from epistemologies which, in turn, are fueled by the motives, needs, and traditions of a group in a specific time and place. Examples would be pre-classical worldviews that conceptualized people as an integral part of nature; knowledge was mediated through tribal shamans and their activities. For the ancient Greeks and other classical groups, knowledge was obtained through rationally constructed metaphysical systems; in Asia and other parts of the world, these systems were less individualistic and more communal. In medieval European societies, knowledge was scholastic and could be found in the correct interpretation of sacred scriptures. The modern approach to knowledge involves a proper application of the empirical scientific method, taking as axiomatic that there can only be one possible answer to any question — a position shared by the metaphysical and scholastic epistemologies that were based on very different assumptions (Krippner, 1995). Although I disagree with the anti-

[1] In this essay, the term 'consciousness' is used to describe an organism's pattern of perceiving, thinking, and feeling at a given point in time. 'Awareness' is used to denote 'conscious awareness', hence is a more limited and specific term than 'consciousness'. Some writers (e.g., Goldman, 2000, p. 2) use the terms 'conscious' and 'aware' interchangeably, but there are values in making a differentiation, especially when discussing epistemology and consciousness.

epistemological slant of many so-called 'postmodernists', I am pleased that postmodernism points to the need for honouring multiple narratives, and becoming aware of the process by which narratives are constructed (see Berman, 2000, p. 323).

Tribal people did not necessarily insist that their mythic worldview was applicable to their neighbours; even when locked in battle, there often was a regard and respect for their opponents' courage. In postmodern writing, there is also a respect for diversity, empathy for other human beings, and concern for other life forms; all are reminiscent of shamanic worldviews. Postmodernists hold that there can be many viable worldviews, depending on who is asking the question and the methodology used in answering it (Krippner, 1995). Therefore, the case can be made that postmodernists have returned full circle to certain premodern shamanic perspectives, regaining valuable aspects of an epistemology that was denigrated as a result of colonization and conquest.

Shamanic eclecticism and syncretization was apparent in my interviews with María Sabina, who put her epistemology into concrete terms. At the time of our interviews, doña María had retired from active shamanizing, but she told me, 'When someone came to me for help, we would eat the mushrooms together. Jesus Christ is in the mushrooms and he revealed to us the solution to the problem.' Wasson (1981) observed that the mythical origin of doña María's *veladas* dates back to the time when Piltzintecuhtli, the 'Noble Infant', received the sacred plants as a gift from Quetzalcoatl. Doña María's references to Jesus represent a synthesis of the Christian and the pre-Conquest religions (p. 17).

### Categories of Spiritual Practitioners

Winkelman (1992) studied the records of religious and magical practices in forty-seven different societies, past and present, finding documentary evidence from these societies identifying several categories of spiritual practitioners. These practitioners claimed to have access to spiritual entities (e.g., deities, ghosts, spirits). They directed a society's spiritual activities (e.g., prayer, sacred ceremonies), employing special powers (e.g., casting spells, bestowing blessings, exorcising demons) that allowed them to influence the course of human affairs in ways not possible by other members of their social group.

Winkelman found remarkable similarities among these clusters of practitioners, especially regarding the manner in which their roles changed as societies became more complex. For example, he found shamans in those groups with no formal social classes; their presence was typical of hunting and gathering tribes and fishing societies. The Creek, Crow, and Kiowa were among the Native American tribes that awarded considerable prestige to the shamans in their midst. Each society had a different word to describe what are now called 'shamans', and the specific duties expected of these practitioners differed from group to group.

Once a society became sedentary, centralized, and began to practice agriculture, social stratification took place; in addition to the division of labour, political and economic divisions occurred. Priests or priestesses emerged, taking control

of a society's religious rituals while the shaman's political power and social status were reduced. According to Winkelman, the term 'shaman/healer' (or 'shamanic healer') is a more accurate description of this practitioner because healing became his or her major function.

The role of the shamanic healer became specialized and formal; official initiation ceremonies and training procedures became more common. Political development beyond the level of the local community was observed in almost all the societies in which priests were present. The Jivaros in South America and the Ibo tribe in western Africa are among the few groups in which priests were assigned a healing function; priests also served healing purposes in Japanese Buddhist and Kurd Dervish groups. However, the shamanic healer typically engaged in more self-regulatory activities and the accessing of changed states of consciousness than did priests and priestesses.

Political integration became even more complex when separate judicial, military, and legislative institutions appeared. Along with this complexity, the malevolent practitioner (i.e., sorcerer or witch) appeared. Originally, shamans cast hexes and spells on tribal enemies; these functions were taken over by the sorcerer and, for a price, were often directed against members of one's own social group. Potions and charms became the province of witches and their associates. The shamanic healer's scope of action was now reduced not only by priests, but by sorcerers and/or witches as well. There were sorcerers among the Aztecs. There were witches among the Navahos. In my visit to Oaxaca to interview María Sabina, I found a society replete not only with *sabias* (shamanic healers) such as doña María, but sorcerers (*brujos*) as well as the local Roman Catholic priest.

Further political complexities and continued dependence on agriculture became associated with the development of another practitioner, the diviner or medium, such as those found among the Eurasian Kazakhs. At one time the shaman's repertoire had included divination and talking with spirits; later, mediums and diviners began to specialize in this feat, often 'incorporating' the spirits and allowing them to speak and act through their voices and bodies. At this point, the shaman's role was dispersed to the extent that the only remaining functions were specialized healing capacities as the performing of healing songs and dances, dispensing herbal medicines, and diagnosis, bone-setting, midwifery and surgery. Winkelman refers to these practitioners as 'healers' (or 'shamanistic healers'). Like shamanic healers, shamanistic healers held the healing of one's spirit in high regard, but became more involved in individual work than in community work. Furthermore, changing one's state of consciousness and journeying to the spirit world no longer was a core element of their work, as was the case with shamans and shamanic healers.

This classification system was found to be quite accurate when cross-societal comparisons were made (Winkelman, 1997). With only two exceptions, shamans never were found in tribal groups that displayed an administrative political organization beyond the local level. No shamans were found in sedentary societies where the nomadic way of life was absent. When Winkelman traced the development of these four categories (i.e., the 'shaman complex', priests, diviners,



malevolent practitioners), he did not assign the terms 'higher' and 'lower' to the states of consciousness utilized while engaging in their practices.

The shaman's ways of knowing depended on accessing information from spiritual entities in 'upper worlds', 'lower worlds' and in 'middle earth' (i.e., ordinary reality). In contrast, the priest's epistemology was dependent on a body of revealed knowledge, often preserved in the form of sacred scripture. Diviners used their own bodies as vehicles for information that was transmitted through them, while malevolent practitioners also depended upon traditional knowledge, either written or passed down verbally. It was not unusual for this material to resemble a 'cook-book' that spelled out the technology which was to be used to inflict various hexes and spells. In contrast, shamanic ways of knowing were dynamic and active. Shamanism demanded both flexibility and strength on the part of the practitioner who would bargain, negotiate, or plead with spiritual entities for the knowledge that would save his or her community from a plague or restore a lost soul to its owner.

### Shamanic States of Consciousness

The word 'consciousness' is used in various ways, but I define it as the pattern of an organism's perceptual, cognitive, and affective activities and/or experiences at any given moment in time. An alteration of consciousness is a significant shift or deviation in an organism's customary pattern as experienced by that organism and/or observed by others. Some of these shifts have been considered 'states' of consciousness because they are marked by behaviours and experiences that typically cluster together; each society has its own conception of what constitutes an 'ordinary' state of consciousness and what may be considered 'changed' or 'altered' states of consciousness. Winkelman (1992) notes that in each of the forty-seven societies he studied at least one type of practitioner demonstrated a shift in consciousness associated with his or her apprenticeship and role-training. Wade (1996) adds that 'Virtually all shamanic experiences occur in an altered state, which cannot be regarded as a naturally-occurring developmental stage' (p. 277).

Bourgignon (1976) studied 488 societies (57% of those represented in an ethnographic atlas), reporting that 437 of them (89%) had one or more institutionalized, culturally patterned changed state of consciousness, some of which were only experienced by the society's spiritual practitioners. What can we make of the other 11%? Berman (2000) proposes that 'such beliefs and practices, even if wired into the brain in terms of capacity, get triggered only in certain cultural contexts' (p. 29). This emphasis on context is apparent in Peters and Price-Williams' (1980) comparison of forty-two societies from four different cultural areas. They determined three commonalities among changed states of consciousness entered by shamans: voluntary control of entrance and duration of the altered state; ability to communicate with others during the altered state; memory of the experience at the conclusion of the altered state. Shamans in eighteen of the cultures studied by Peters and Price-Williams (1980) engaged in spirit 'incorporation', ten in

out-of-body experience or journeying, eleven in both, and three in some different altered state. However, there are shamanic groups, such as the Navaho *hataali*, who deny entering altered states. The *hataali* rely on knowledge, not trance phenomena or magical effects. Their chant work is 'a restrained and dignified procedure', and they represent, for the client, 'a stable dependable leader who is a helper and guide until the work is ended' (Sandner, 1979, p. 258). To me, this seems more like a case of heightened perception than an altered state.

Those shamans who enter altered states employ various technologies. These include ingesting mind-altering plants (e.g. María Sabina), chanting (again, doña María), concentrating, dancing, drumming, jumping, fasting, running, visualizing, participating in sexual activity, refraining from sexual activity, engaging in lucid dreaming, and going without sleep. Rarely is one procedure used in isolation. For example, mind-altering plants are often ingested in the evening; sleep deprivation, restricted night-time vision, and accompanying music often enhance the experience's profundity. Song and dance were important elements in ritual, and probably preceded it. Naturally occurring altered states, such as dreaming and daydreaming, may also be utilized (Harner, 1988; Rogers, 1982). Whitley (1998) suggests that one of the functions of rock and cave image-making may have been to record the images elicited in shamanic states of consciousness.

The Ojibway Indians shocked Jesuits priests on their arrival in North America with their behaviour during their traditional healing procedures. It was customary for Ojibway *wabeno* (shamans) to heal by means of drumming, rattling, chanting, dancing erotically (while naked), and handling live coals. The *wabeno* then rubbed their heated hands over the client while chanting the songs previously learned in their vision quests (Grim, 1983, pp. 144-5). Among the Dieguenos and Luisenos Indians of southern California, potential shamans were selected as early as nine years of age on the basis of their dreams. It was important that a prospective shaman in these tribes also have visionary experiences that result from ingesting such mind-altering plants as datura or jimson weed during their ceremonies. During these altered states, the novice received a guardian spirit in the form of an animal totem as well as healing songs and other knowledge about cures and dream interpretation (Rogers, 1982, p. 21).

Symbolic manipulation is apparent in shamanic rituals, and altered states often help to access these symbols. Symbols are more than ritual markers that denote the beginning, middle, or end of the process; they serve as keys that unlock the door to a full participation in the ritual, taking participants into another order of reality where spirits come to life and healing dramas unfold (V. Turner, 1968). The drum often symbolizes the 'World Tree' the shaman needs to climb so as to reach the 'upper world' (or descend to the 'lower world') during the altered state. What they find in these realms differs from society to society; in some, the 'upper world' is the home of ancestors, but for others, they reside in the 'lower world'.

The ritualistic blowing of smoke in four directions symbolizes an appeal to spirits in the 'four quarters' of the universe. Directionality is apparent in the elaborate Navaho sand paintings that the shamans destroy after they have served their purpose. Symbolism is also evident in the reports from those vision quests of the

Plains Indians that helped future warriors contact their guardian spirits. Dobkin de Rios (1984) describes these quests as attempts at 'personal ecstatic learning' in the service of eliciting biochemical changes in the body that would enhance the altered state. Hence, tribal shamans played an important role in preparing, instructing, and guiding their initiates, as well as interpreting their visions (p. 57).

### The Evolving Mind

As the study of the origin, nature, and limits of knowledge, epistemology is closely associated with Western concepts of consciousness (Winkelman, 2000, p. 177). For many years, Durkheim's (1912/1995) theories were especially influential. Taking Australian totemism as the prototype for all early spiritual experience, Durkheim focused on the feelings of security gained by life in a secure group. He conjectured that early tribes projected these feelings on to whatever object they were close to at the time they experienced them. In this way, plants, animals, rocks, and other objects were imbued with 'power', the capacity to instill strong feelings and to assist the person who befriended, ate, or wore them. According to Durkheim, ritual behaviour preceded language, which only became necessary when communication with imaginary beings was mandatory.<sup>2</sup>

More recently, neuropsychology has impacted explanations of these phenomena. A perspective that is especially useful in understanding shamanic epistemologies has been proposed by Newton (1996) who attempts to unravel certain entrenched philosophical puzzles concerning both consciousness and representational thought. Taking exception to purely linguistic theories of cognition, Newton takes a parsimonious 'postmodern' position on humanity's attempts to represent reality. For Newton, humanity's variegated experiences with reality demonstrate the vast range of specific sensorimotor images and sensations that constitute its direct, ongoing understanding of the environment. For Newton, thinking makes use of the same neurological (i.e., neurognostic) structures involved in sensorimotor activity, structures that take the form of analogue models of reality; the resulting images ground humankind's concepts, constructs, and intentions.

To support this thesis Newton cites behavioural data, findings from neuroscience, and evolutionary evidence, that language was a tool for communication before it became the primary determinant of cognition. Taking issue with both the 'reductionists' who explain sensory phenomena simply as brain properties and the 'new mysterians' who see consciousness as something beyond the reach of physical theory, Newton constructs a sturdy framework that unifies not only body and mind but linguistic and nonlinguistic human activities as well. Donald's (1991) model, compatible with that of Newton, gives mythmaking a key role in human evolution, and describes 'scenario-building' as the primary function of human mental complexity (also see Alexander, 1979). When mythic worldviews

[2] Durkheim's work has been unjustly ignored by many contemporary writers. His suggestion that language is associated with 'displaced reference' (i.e., to communicate what is imagined or imaginary) is worthy of consideration when discussing shamanic states of consciousness.

were performed ritually, participants were confronted with representations of objects and events in addition to those items themselves.

Corballis (1991) posits a hypothetical 'generative assembling device' in the human brain, and gives it credit for constructing these cognitive representations from 'small vocabularies of primitive units' (p. 219). Jerison (1990) describes language as a 'sensory-perceptual development' and states that its role in communication first evolved as a side effect to its role in reality construction; thus, 'we need language more to tell stories than to direct actions. In the telling we create mental images in our listeners that might normally be produced only by the memory of events as recorded and integrated by the sensory and perceptual systems of the brain' (pp. 15-16). This capacity required an enormous amount of neural tissue, and the convolutions of the human brain were associated with the development of language and related capacities for mental imagery (p. 16).

Some of these mental images are termed 'images of achievement' by Vandervert (1996) because they reflect a learned imaging process in the cerebral-motor cortex. This process extends into the extrapolated anticipatory future by means of fast time computations of the cerebellum, and these images continually predict the outcomes of the next steps of human action or achievement. These images are often symbolic in nature, allowing for a condensation of considerable information and meaning.

Since the time of Goethe, many scholars have proposed that the epistemology of primordial people began with their sensorimotor experiences (Flaherty, 1992, p. 168). According to these scholars, mythmaking, a basic propensity of humankind, has its referents in bodily functions as well as in observable nature. Sansonese (1994) notes, 'The more ancient the myth, the more often do parts of the human body play an explicit role in the myth' (p. 7), for example, Adam's Rib and the Egyptian myth of Set and Isis. It will be recalled that one of the possible derivations for the term 'shaman' is 'one who is excited, moved, or raised' while another is 'inner heat'; both refer to bodily processes and the appreciation of the sensory world. In addition, they both are examples of politicized talents (along with fire mastery, symbolic death, and entering 'trance') that privatize shamanism and restrict its membership.

In his account of the evolution of the human mind, Mithen (1996) describes the emergence of general intelligence as well as of four specialized 'cognitive domains', namely technical intelligence, social intelligence, natural history intelligence, and language. It is likely that these 'domains' share information in what Baars (1997) refers to as a 'global workspace'. Consistent with Newton's (1996) emphasis on language as a tool for communication (and contrary to Durkheim's position), Mithen (1996) holds that language was originally social. Once the capacity for language was present it was highly adaptive, eventually providing early humans with the ability to reflect on their own and other people's mental states (p. 140). In this way, it began to interact with social intelligence and, still later, early humans were able to talk about tool-making (technical intelligence) as well as hunting and plant gathering (natural history intelligence). Such capacities

were advantageous because they could construct more accurate, hence more adaptable, models and descriptions of external events (Povinelli, 1993, p. 507).

Once these intelligences became linked across their respective domains, the resulting 'linkage' enabled the production of symbolic artifacts and images as a means of communication. It also led to the essentially human tendency to attribute personality and social relationships to plants and animals, a result of the integration of social intelligence and natural history intelligence. Artifacts indicating human body decoration (e.g., pieces of ochre) date back 80,000 years or more (Gore, 1997, p. 98); other artifacts demonstrating the capacity for visual decoration (e.g., beads, pendants) date back 40,000 years (Mithen, 1996, p. 155) to the time after the Cro-Magnon people emerged. A human-shaped ivory statuette from Hohlenstein-Stadel in southern Germany is the earliest existing statuette and has been dated at 30,000 to 33,000 years (Mithen, 1996, pp. 162). The origins of shamanism are often traced back at least 30,000 years (Eliade, 1972/1951, pp. 503).

In western Europe, the Upper Paleolithic era began some 35,000 years ago, and is best known for its remarkable efflorescence of image-making (Clottes & Lewis-Williams, 1998/1996). For example, the paintings in the Lascaux caves of southern France date back 17,000 years. The prone figure depicted on one of the walls is often regarded as a shaman experiencing an altered state of consciousness (e.g., Eliade, 1972/1951, p. 504), but Berman (2000) asks, if shamanism was so important in Paleolithic times why do such figures occur so rarely? (p. 25). No matter what these images represent, it is possible that symbolic image-making had been accomplished earlier but was executed on materials that did not survive.

During my visit to Lascaux in 1997, our group was allowed only thirty-five minutes to tour the cave and appreciate its images; even so, it would take the cave's atmosphere several hours to recuperate from our intrusion. We were overwhelmed by the raw power of the colourful wild horses, antlered reindeer, and massive bison we encountered. Negative space, a technique not used again in Europe until the 16th century, was utilized to create perspective. The cave's surface brings a three-dimensionality to the paintings — a naturally-formed hole provides the eye for one animal, and a bulging rock becomes the shoulder of a bison.

There are a plethora of geometric forms thought by some to be signatures of the artists; if so, this convention was not revived until the Renaissance. Some animals have been cleverly painted so that they share body parts, while other figures are superimposed on each other and distinguished by colour shading (Societe Prehistorique Francaise, 1990; Vanaria, 1997). And, for some observers, the most exceptional feature of the drawings is their narrative form; they appear to tell a story (Delluc *et al.*, 1990, p. 57). I agree with Tattersall's (1998) comment that upon leaving Lascaux one is overawed by the magnificence of what these remote ancestors wrought many millennia ago. However, Hughes (2000) notes that the rock paintings in the sacred cave sites scattered across northwestern Australia, 'are as impressive as anything in the caves of Lascaux or Altamira, and tens of thousands of years older. As far as we know, The Australian Aborigines stood at the very dawn of human image-making' (pp. 110–11).

In the European caves, 'a small nodule becomes an animal's eye; sometimes a natural swell of the rock face was taken to delineate the chest or shoulder of an animal; sometimes the edge of a shelf became the back of an animal. To these natural features, the artists added lines, thereby transforming the given into the created. Frequently these images appear to be coming out of the rock wall. At Rouffignac, for instance, a horse's head is painted on the side of a protruding flint nodule. The rest of the horse is apparently behind the rock face' (Clottes & Lewis-Williams, 1998/1996, p. 16). To some, these features suggest a search for spirit animals that could become 'allies' if they could be drawn by shamans through a permeable 'membrane' that separated the ordinary and the non-ordinary worlds (*ibid.*). In the Niaux cave, for example, the shadows cast across the rock can represent, to the expectant eye, the outline of a bison; then only a few deft strokes were needed to add the rest of the body. If the light is moved, the animal disappears back through the 'membrane'. The person has thus mastered the spirit animal; he or she can make it come and go at will (p. 17). Once more, Berman (2000) cautions that there are other explanations for the profusion of animal images, one of them a simple desire to execute a naturalistic portrayal. Sometimes, grazing deer are simply grazing deer (p. 31).

Symbolic or not, Winkelman (2000) points out that neuropsychology provides a basis for these rock art motifs; hardwired neurologically structured perceptual constants are the structural basis of these motifs, reflecting perceptions obtained through shamanic states of consciousness. The animal images reflect 'the importance of neurognostic perspectives in understanding shamanism' (p. 6). Clottes and Lewis-Williams (1998/1996) take a somewhat extreme position, stating that 'all shamanic activity and experience necessarily take place within a particular kind of universe, or cosmos. [But] the ways in which this shamanic cosmos is conceived are generated by the human nervous system rather than by intellectual speculation or detached observation of the environment' (p. 19). For me, neurognostic potentials and social construction operate in tandem, and the ensuing dance produces a phenomena that needs to be examined from the vantage point of both perspectives.

Commenting on the paintings themselves, Mithen (1996) deduces, 'There is nothing gradual about the evolution of the capacity for art: the very first pieces that we find can be compared in quality with those produced by the great artists of the Renaissance. . . . All that was needed was a connection between these cognitive processes which had evolved for other tasks to create the wonderful paintings in Chauvet Cave' which date back some 30,000 years (pp. 162-3). Also predating Lascaux was the extraction of decorative red and black pigment from Bomvu Ridge in South Africa, some 40,000 years ago (Boshier & Costello, 1975).

The magnificent distinctiveness of these works is noteworthy in view of Ludwig's (1992) proposition that 'the visionary or magic function of these media . . . was more important than esthetics' (p. 459). 'The shaman artist . . . employed carved masks, music and art for the purposes of healing, negotiation with unseen spirits, exerting magical influences on creatures, and depicting his [or her] adventures in the spirit world' (*ibid.*). Again, neurognostic structures can be

hypothesized to have formed the basis for these creative products; Clottes (in Gore, 2000) asserts 'People can no longer say art evolved from crude beginnings' (p. 108).

The sepia, black, and red ochre Chauvet, Altamira, and Lascaux paintings might be symbolic. However, Berman (2000) offers an alternative: the experience of these early humans was direct and immediate (p. 81). This epistemology runs through many postmodern writings; for example, Globus (1995) remarks, 'We do not know reality, according to postmodernism, by means of any representations of reality. We know reality directly and immediately; there is nothing that gets between us and the reality we always and already find ourselves in' (p. 127).

Modernity, in contrast, relies on representations of reality — mental and neural representations that mediate between humanity and the world. In other words, modern epistemologies assume that an investigator can provide a near-identical match between words and the phenomena they attempt to describe. Postmodern epistemologies assume that this type of representation is impossible, and that symbolism, metaphor, and allegory provide better descriptions of one's immediate outer and inner experience and that several descriptions, some of them paradoxical, frequently are used to 'deconstruct' a phenomenon in an attempt to creatively fathom it.

### Shamanic Epistemology

For the shaman, everything provided knowledge about everything else, and the whole of being was 'fundamentally an immense signal system' (Kalweit, 1992, p. 77). Shamanic states of consciousness were the first steps toward deciphering (or deconstructing) the signal system, and this was made possible once humanity's symbolic capacity matured. At that point 'language shifted from a social to a general-purpose function, consciousness from a means to predict other individuals' behaviour to managing a mental database of information relating to all domains of behaviour. A cognitive fluidity arose within the mind, reflecting new connections rather than new processing power' (Mithen, 1996, p. 209). To this discussion of signal systems, I would add that role-playing, as well as language, be considered a likely contender as the mechanism for cognitive fluidity. Pretending and role-playing enable people to represent the internal state of others, a skill that enables cognitive cross-referencing to take place.

Clottes and Lewis-Williams (1998) have proposed three stages of shamanic consciousness. In Stage One, people move from alert consciousness to a 'light' alteration, beginning to experience geometric forms, meandering lines, and other 'phosphenes' or 'form constants', so named because they are wired into the nervous system. For example, the Tukano of South America use undulating lines of dots to represent the Milky Way, the goal of shamanic journeying.

In Stage Two, people begin to attribute complex meanings to these 'constants', and in Stage Three, these constants are combined with images of people, animals, and mythical beings. Experiences began to interact with these images, often feeling themselves to be transformed into animals, either completely or partially (e.g.,

the celebrated Les Trois Freres animal/human); shamanic journeys are generally felt to be more feasible in this form (p. 19). Various chambers of Upper Paleolithic caves seem to have been restricted to advanced practitioners; some caves have spacious chambers embellished with large, imposing images while elsewhere there are often small, sparsely decorated diverticules into which only a few people could congregate (p. 20).

From an epistemological perspective, the shaman could gain knowledge from his or her journeys into other realms of existence, and communicate the results to members of the community (Flaherty, 1992, p. 185). Shamans provided information from a database consisting of their dreams, visions, intuitions, as well as their keen observations of the natural and social world. Sansonese (1994) suggests that there was 'a degree of genetic predisposition for falling into trance' and that this ability made a significant contribution to social evolution (p. 30). For example, there was a succession of Indo-European shamans whose traditions included parent-to-child transmissions of shamanic lore that, in turn, institutionalized extended-family shamanic groups (*ibid.*).

The ability to manipulate symbols was essential in the interpretation of dreams and visions as well as in the creation of myths. For Sansonese (1994), 'a myth is an esoteric description of a heightened proprioception' (p. 36). 'Myth describes a systematic exploration of the human body by privileged members of archaic cultures. Myth springs from an age of universal narcissism, rooted, one must suppose, in the elemental struggle for survival' (p. 37). Explanations were needed for birth, death, illness, procreation, and other bodily phenomena, as well as for cyclones, forest fires, floods, sunsets, eclipses, and the changes of seasons.

There were many contenders for survival millennia ago. However, Mithen (1996) proposes that *homo sapiens*, who date from about 250,000 years ago (Jerison, 1990, p. 10), had an evolutionary advantage over other early humans. *Homo sapiens sapiens* were able to use symbolism in image-making and storytelling, both of which were adaptive because they helped to make sense of one's body, one's peers, and one's environment.

Neanderthals were powerfully built, large-brained people who seemed to display an equivalent sophistication to modern humans in their manufacture of stone tools, and had the vocal mechanisms needed for rudimentary speech. But Neanderthals lived in inclement climates (Mithen, 1996, p. 125), were prone to degenerate diseases (p. 126), and lacked the technology to sew garments and — most curiously — the ability to produce elegant pictorial images. There are a few pieces of pierced bone attributed to Neanderthals, but even these artifacts are in doubt (p. 135). There is no conclusive evidence that ritual was a part of Neanderthal burials, or that human-made objects were placed within the graves (p. 136). In any event, the Neanderthals disappeared less than 30,000 years ago (Tattersall, 1998). In the meantime, with specialized intelligences that could effectively communicate with each other, *homo sapiens sapiens* were probably unique among early humans in their ability to symbolize, mythologize, and, eventually, to shamanize.



Taussig (1987) describes the 'inscription of a mythology in the Indian body' where 'power is invested' (p. 27), while Sansonese (1994) remarks, 'Something is being described in myth, something about the human body, something essential to its workings but also truly technical and beyond mere fetish' (p. 38). He also notes that 'the development of myth parallels the esoteric impulse in storytelling' (p. 38). The domination of *homo sapiens sapiens* may have been due to their ability to take sensory and motor activity, using it as a bridge to produce stories that assured their survival (Boaz, 1997; Cavalli-Sforza & Cavalli-Sforza, 1995; Fagan, 1990; Kingdon, 1993; Ruhlen, 1994; Stringer & McKie, 1996).

The way people come to report the feeling states that arise within their own bodies is incompletely understood (Lubinski & Thompson, 1993). Nevertheless, these private events have been a prime source for the creation of myths by the shaman and the community (Devereux, 1997). Lubinski and Thompson (1993) have underscored the role of pharmacological agents in bringing internal feeling states into awareness, citing animal research to buttress their argument. Merkur's (1998) description of 'psychedelic ecstasies' includes categories in which internal dialogues reflect feeling states invoked by LSD-type drugs, while Nesse and Berridge (1997) have identified the associated neural mechanisms, noting their evolutionary origins.

To the impact of external pharmacological agents, one might add the contribution of the body's own biochemistry, especially during rapid eye movement (REM) sleep, often characterized by dreaming. Ullman (1987) claims that REM sleep reflects a genetic imperative that often orients the dreamer's 'felt connections to others' in the interest of species survival; research with other organisms suggests that REM sleep or a precursor is the earliest form of mammalian sleep (Siegel, 1997).

Hobson (1988), operating from a different paradigm, adds that dreaming is a 'behavioural state' that reflects an evolutionary specialization (pp. 112-13). He continues, 'in dreams, problems are not only posed but sometimes even solved' (p. 16) and somatic stimuli are one source of the images that the brain converts into dream narratives (p. 46). I would suggest that shamans were especially adroit in using dream and psychedelic imagery to address and find solutions to the conundrums periodically faced by members of their community and the group as a whole.

### Shamanism and 'Higher' States

Wilber (1981) notes that shamans were the first practitioners to systematically access 'higher' states of consciousness. He categorizes these 'higher' states as the 'subtle' (those leading to enhanced mental imagery both with form, e.g., angels, spirits; and without form, e.g., 'white light', 'music of the spheres'); the 'causal' (those states in which there are no longer any forms in one's awareness, e.g., 'pure awareness', 'the void'); and the 'absolute' (the state in which consciousness has experienced its 'true nature' and in which a 'ground of being' is experienced). According to Wilber the shamans' focus has been on 'subtle' states because their

technology was directed toward assisting other people with the images obtained in their shamanic journeys.

Wilber (1981) has taken the position that consciousness not only unfolds during the life-span of an individual, but during the evolution of humanity in general, with some individuals representing the 'farthest reaches' of that development (p. 142). In his hierarchy of 'higher' states of consciousness, shamans are placed at the 'subtle' level because their technology, described as 'crude' (p. 142), was directed toward assisting others with the images and knowledge that was produced in shamanic journeys. Wilber grants that an occasional shaman broke into the 'causal' realm, but insists that it was not until the emergence of the meditative and contemplative traditions that 'causal' and 'absolute' states could be systematically attained. This evolution of consciousness, according to Wilber, was not part of a biological process but due to the development of such elements of spiritual practice as 'rigorous systems of ethics', 'emotional transformation', the 'training of attention and concentration', and the 'cultivation of wisdom'.

However, Eliade (1972/1951) found comparative examples of the oldest types of Christian and Hindu mystical experience in Alaskan Eskimo shamanism. Walsh (1990) found 'rigorous systems of ethics' in those North American shamanic traditions emphasizing compassion. He discovered 'emotional transformation' among Australian aboriginal shamanic initiation programs, and 'training of attention and concentration' among Eskimo initiates who were subjected to a 30-day period of isolation where they were directed to 'think only of the Great Spirit'. Furthermore, Walsh found 'cultivation of wisdom' in Ainu, Cuna, and Zuni shamanic traditions where entire mythologies, pharmacopoeia, and song cycles had to be memorized and understood. After surveying the cross-cultural research, Coan (1987) warns, 'It would be a mistake to assume that shamanism represents just one stage either in the evolution of human society or in the evolution of human consciousness' (p. 62).

Brown and Engler (1986) administered the Rorschach Inkblot Test to practitioners of 'mindfulness meditation', discovering that their responses illustrated their stages of meditative development, reflecting 'the perceptual changes that occur with intense meditation' (p. 193). One Rorschach was unique in that the 'advanced master' integrated all 10 inkblots into a single associative theme (p. 191). However, Klopfer and Boyer (1961) had obtained a similar protocol from an Apache shaman. This shaman used the inkblots to teach the examiner about his lived worldview and his ecstatic flights through the universe. Brown and Engler (1986) suggested that this may be a response that, regardless of the spiritual tradition, points 'a way for others to "see" reality more clearly in such a way that it alleviates their suffering' (p. 214).

Moreover, a careful reading of Wilber (1981) suggests a limited familiarity with the literature on shamanism. He refers to Eliade's (1972/1951) *Shamanism: Archaic Techniques of Ecstasy* as 'the definitive study of the subject' (p. 70). Yet, it takes nothing away from the importance of this pioneering work to suggest that Eliade 'did not address the subject matter in the appropriate cultural context' (Ripinsky-Naxon, 1993, p. 11). For example, Eliade displayed 'personal bias' in

using the term 'degenerate' to describe the use of mind-altering substances by shamans, failing to 'recognize the critical role of hallucinogens' in many forms of shamanism (p. 103).

In addition, Wilber (1981) makes such sweeping generalizations that it is hard to believe that he recognizes the varieties of shamanic experience. He calls the bird 'the classic symbolism of shamanism' (p. 70), although in some shamanic societies, the deer or the bear is the central totem (e.g., Ripinsky-Naxon, 1993). Wilber claims that the 'true' shamanic experience involves 'a severe crisis' (pp. 73-4) although there are accounts of shamanic callings that do not involve physical, emotional, or spiritual catastrophes (e.g., Krippner & Welch, 1992). Indeed, the shamanic 'crisis' could well be a political strategy that limits the number of contenders for the shamanic role in those societies that demand it.

Wilber describes shamanism as a 'religion', albeit one that is 'extremely crude, very unrefined, and not highly evolved' (p. 75), placing it at the fifth level of an eight-level spectrum (p. 253). But most writers on shamanism focus on its technologies, its worldviews, and its ways of knowing rather than on its resemblance to institutionalized religions (Harner, 1980; Krippner & Welch, 1992). Indeed, there are Buddhist shamans, Islamic shamans, Christian shamans, and neo-pagan shamans. At most, shamanic practices have led to religious syncreticism (Ripinsky-Naxon, 1993, p. 207), e.g., Tibetan Buddhism and Taoism reflect earlier shamanic practices. By writing about 'the true shaman' (p. 76) rather than of shamans and shamanic experiences (Heinze, 1991; Walsh, 1990), Wilber focuses on a hypothetical figure that has been socially constructed over the ages. He could have served his purposes better by spreading his net more widely, catching and evaluating an assortment of practitioners and social groups who have manifested so-called 'subtle' states over the millennia.

Wilber probably would consider María Sabina's *veladas* typical 'subtle' state imagery, but what could María Sabina have chanted that would have been more meaningful to her clients and more descriptive of her work?

These are my children,  
 These are my babies,  
 These are my offshoots,  
 My buds,  
 I am only asking, examining,  
 About His business as well,  
 I begin in the depth of the water,  
 I begin where the primordial sounds forth,  
 Where the sacred sounds forth.  
 I am a little woman who goes through the water,  
 I am a little woman who goes through the stream,  
 I bring my light,  
 Ah, Jesus Christ,  
 Medicinal herbs and sacred herbs of Christ,  
 I'm going to thunder,  
 I'm going to play music,  
 I'm going to shout,  
 I'm going to whistle,

It's a matter of tenderness, a matter of clarity,  
There is no resentment,  
There is no rancor,  
There is no argument,  
There is no anger,  
It is life and well-being.

(Estrada, 1981, abridged, pp. 136, 150-151, 165, 175)

In these brief excerpts from María Sabina's *veladas*, we find a woman who goes into the primordial waters of oceanic consciousness. However, she does not stay there because her orientation is toward service, toward healing, toward her community, and toward the children and babies to whom she strives to bring life and well-being.

Obviously, there is no way of knowing if María Sabina had reached the 'causal' or 'absolute' realm of Wilber's hierarchy. If so, what knowledge would she have obtained that would have been more useful to her in her mission than the symbolic images and metaphors that emanated in her *veladas*? Nor is Coan (1987) impressed by Wilber's 'sharp dichotomy' (p. 143); the shaman can use many dimensions of consciousness at different times for different purposes. No shamanic performance is ever exactly the same!

These *veladas* demonstrate María Sabina's shamanic ways of knowing by means of the 'sacred herbs' that facilitate her journey through the 'heart' and through the 'water', bringing her 'light' and 'tenderness' in the service of 'life and well-being'. Here we have an example of the shamanic images 'that are directed at reestablishing and maintaining a balanced relationship between nature and the community and at caring for the spiritual and physical welfare of its members' (Ripinsky-Naxon, 1993, p. 207). The *veladas* also provide examples of ritual as social performance (V. Turner, 1968) and of symbols that seem to 'trigger' healing (E. Turner, 1992). From a postmodern perspective, it is merely an intellectual exercise to arrange such manifestations of consciousness on a scale of 'lower' to 'higher' without considering the demands of a local situation at a particular moment in time.

### Discussion

Western science is characterized by a search for satisfactory explanations of 'reality'. This search is achieved by statements of general principles; these can be tested experimentally or through repeated observations (Goldstein & Goldstein, 1978). Shamanic epistemology also attempts to explain 'reality', employs repeated observations, and makes statements about general principles. However, credence is given to revelation and inspiration from the 'spirit world', from plant and animal 'allies', and from 'journeys' associated with changed states of consciousness. A provocative example is the complex brew *ayahuasca*, which goes by many other names, depending on the part of the Amazon where it is used. Shamans have imbibed *ayahuasca* for hundreds of years, but its origin remains a mystery to Western investigators. Some tribes attribute this knowledge to

spiritual beings from subaquatic realms, others to the intervention of giant serpents (Luna & White, 2000).

Narby (1998) comments, 'Here are people without electron microscopes who choose, among 80,000 Amazonian plant species, the leaves of a bush containing a . . . brain hormone, which they combine with a vine containing substances that inactivate an enzyme of the digestive tract, which would otherwise block the effect. And they do this to modify their consciousness. It is as if they knew about the molecular properties of plants and the art of combining them, and when one asks them how they knew these things, they say their knowledge comes directly from [the] plants' (p. 11). For three decades, I worked with an intertribal medicine man and shamanic healer, Rolling Thunder. When I asked him how he was able to identify the curative power of plants he had never used previously, he told me, 'I ask the plant what it is good for. Some plants are only meant to be beautiful. Other plants are meant for food. Still others are to be used as medicine. Once a healing plant has spoken to me, I ask its permission to take it with me and add it to my medicine pouch.' Rolling Thunder's epistemology was remarkably similar to that of the Amazonian shamans who work with *ayahuasca*.

In a world beset by quandaries and crises, survival no longer depends upon the process of natural selection or chance mutations, but rather on intentional deliberations and conscientious decision-making. Western modernity has failed to build a universal human culture upon a foundation of abstract rational thought. Humanity can not repeat the past, but postmodernity would do well to reconsider the personal, metaphorical language that the Royal Society of London deliberately scuttled in its attempt to produce a universal language of objective and unequivocal symbols (Mahoney & Albert, 1997, p. 23). The failure of this project ignored one of the points permeating this essay: language makes use of the same structures as those involved in sensorimotor activity; these structures take the form of analogue models of reality, and the resulting images ground humankind's concepts, constructs, and intentions.

Vandervert's model (1996) provides a 'neuro-epistemological' framework for this proposition; he writes that 'the neuro-algorithmic organization of the phylogenetic brain is that which evolved originally as the algorithms for perception, learning-memory, cognition, and emotion-motivation involved in the struggle for survival' (p. 82). These representations are reflected in shamanic technologies which, first and foremost, were devoted to finding game animals, locating and using medicinal plants, determining the best time to plant and harvest crops, and other matters of daily survival. Shamanic technologies also had spiritual uses, but contemporary Westerners often emphasize the transcendental side of shamanism to the neglect of its practical aspects.

Vandervert (1997) proposes that 'image-schemas' (see Mandler, 1988) are not tantamount to the organism's storehouse of images, but the space-time representations that co-exist with perceptual processes, both of which precede mental imagery. These space-time simulation structures are genetic in origin and are responsible for the state-estimating functions that are connected to the

cerebrum's mapping systems. The resulting image-schemas are whetted by experience as well as by developmental processes.

Vandervert's proposal that image-schemas represent 'foundational meanings' (p. 111) is reminiscent of Jung's description of 'archetypes', the structural predispositions that allegedly provide the organizing principles for consciousness and behaviour. These image-schemas collectively represent what Vandervert considers to be a 'calculus' of archetypal processing. Such image-schematic processing, although a process of natural selection, had the immanent potential to lead to emergent future state estimates (i.e., nonlinear simulations) that extended beyond purely naturally selected states. This combination of image-schematic elements extended beyond the selective mechanism that evoked them. In this way, image-schematic simulations imparted a freedom beyond natural selection that provided a world of potentially new paths for human intention.

The nervous system evolved in ways that enabled it to foresee many future events, and rapid simulation was the basic approach to survival-conducive prediction (Fox, 1988, pp. 160-1). The nervous system's ability to produce such simulation structures as image-schemas permitted anticipatory, feedforward processing (see Pribram, 1991, chap. 6). For Vandervert, image-schemas represent the foundational structures needed 'for modeling/mapping functions conducive for survival'. Without this ability to make estimates of future conditions, vertebrate organisms could not have survived to reproduce (pp. 114-55). According to Vandervert, these processes originated in the cerebellum but eventually involved 'the entire mapping machinery of the brain' (p. 118); the auditory-vocal sharing of image-schematics eventually led to language (p. 120).

I would propose that the image-schemas of those men and women who a community held to be shamanic practitioners were especially adept when prediction was demanded. Game needed to be located, weather patterns needed to be forecast, enemy movements needed to be anticipated, and flight paths needed to be discovered. These tasks required feedforward processing, and the shamanic fine-tuning of image-schemas through heightened perception and/or changed states of consciousness may have assisted this assignment. Such neurognostic frameworks are needed to coalesce human neurophysiology with human epistemology, and to explore what Chalmers (1996) refers to as 'the hard problem': how consciousness arises from physical systems. 'While evolution can be very useful in explaining why particular physical systems have evolved, it is irrelevant to the explanation of the bridging principles in virtue of which some of these systems are conscious' (p. 121).

One final example from the life of María Sabina demonstrates these image-schemas. When she was called to shamanize, doña María received the image of an open book that grew until it reached the size of a person. She was told that 'This is the Book of Wisdom. It is the Book of Language. Everything that is written in it is for you. The Book is yours, take it so that you can work'. In accepting this call, doña María became a "woman of language" and what Rothenberg (1981) calls a 'great oral poet' (p. 10).

Now may be the time to reconsider the ways of knowing exemplified by doña María, and their sources in imagination, intuition, visions, dreams, the senses, and the body.<sup>3</sup> Perhaps these ways of knowing can enter into tandem with intellect and reason to construct cooperative and collaborative lifestyles for the pluralistic world in which we live, a world which shamanic epistemology would appreciate and enjoy.<sup>4</sup>

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[3] Reports reminiscent of shamanic epistemology and technologies appear from time to time in first-person reports regarding technical and creative accomplishments. Robert Louis Stevenson wrote that ideas for some of his short stories came from the 'little people' who influenced his dreams; Giuseppe Tartini dreamed that a devil composed a piece of violin music for him which he later transcribed; Srinivasa Ramanujan noted that the Hindu goddess Namakkal provided him with original mathematical insights while he dreamed; Herman Hilprecht attributed an archeological discovery to a Babylonian priest who visited him in a dream; Francisco Candido Xavier's prodigious literary output was supposedly made possible by discarnate 'spirits' who dictated his poetry, plays, and best-selling novels; Johannes Brahms confided that his best symphonic work was divinely inspired (e.g., Krippner & Dillard, 1998).

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