

PSYCHOLOGY AND BIOCHEMISTRY
IN THE SHAMANIC WORLD

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Perhaps one of the most baffling and thought provoking aspects of shamanic ideology is its anchorage in the belief in a spirit world paralleling our own earthly world. This spirit world is endowed with the awesome power to heal and to maim, to bring harmony and health, and to punish. Neither world is free from the influence of the other, and the interaction between these two worlds has been the source of myth throughout shamanic history.

Shamans may be seen as conduits between these two worlds, through which the people of the earth glimpse the power and beauty of the spirit world, and experience its awesome healing power. While shamans are often considered healers themselves, it is important to note that the shaman has no real power to cure. Rather, in the words of Black Elk, the power of curing comes

. . . from the outer world, and the visions and ceremonies had only made me like a hole through which the power could come to the two-leggeds. If I thought that I was doing it myself, the hole would close up and no power could come through (Neihardt 1932: 174).

Given just this rudimentary background, it is easy to see how shamanism can tax the aspect of the Western mind that is scientific, and surely skeptical. The idea that spirits affect us on a day-to-day basis and may be employed by us to uncover information, to heal the sick or

injured, and to punish or to maim others is something that boggles a Western mind. Perhaps even more perplexing is the fact that shamanism is the oldest known form of organized religion, and that there exists a large body of evidence that testifies to the power and reality of the spirit world, such as those accounts given in William K. Powers' Yuwipi, John G. Neihardt's Black Elk Speaks, and Mircea Eliade's Shamanism. Perhaps it is this dilemma, that so many people have practiced shamanism for so many years and have amassed definite proof of its inherent healing power, that leaves Western minds searching for a plausible explanation that satisfies their scientific curiosity.

It is not the goal of this paper, however, to support or to discredit the evidence suggesting the existence of the spirit plane. That task can only be left to individual experience. Rather, this paper will demonstrate that several aspects of the shamanic world may be explained in biochemical and psychological terms, while recognizing that there are many other aspects which cannot be, or at least not yet.

The Ecstatic Trance, Chemistry, and the Brain

During an ecstatic trance, the shaman journeys through a world in which he encounters many strange things, the most notable of which are spirits. These spirits tutor him, guide him, provide him with information and, if he is not careful, will try to tempt and even destroy him. This journey is, needless to say, as perilous as it is wondrous.

The shaman enters into an ecstatic trance, an altered state of consciousness, through elaborate and very ancient processes, often times characterized by the ingestion of hallucinogenic substances. According to Peter Furst, such plants and fungi as tobacco, cannabis, nutmeg, ololiuhqui (morning glory), mushrooms, fly-agaric, datura, and peyote, are just a few of the psychotropes used by shamans to achieve the ecstatic trance. Yet, as he states, there are other methods the shaman may employ to induce an ecstatic trance, such as:

. . . fasting, thirsting, self-mutilation, torture, exposure to the elements, sleeplessness, incessant dancing and other means of total exhaustion, bleeding, plunging into ice-cold pools, near-drownings, laceration with thorns and animal teeth, and other painful ordeals, as well as a variety of nonhurtful "triggers", such as different kinds of rhythmic activity, self-hypnosis, meditation, chanting, drumming, and music (Furst 1976: 10).

Given that we know there are certain physical and chemical methods the shaman uses to achieve an altered state of consciousness, we may ask what exactly is an "altered state of consciousness", how do these methods succeed in producing this condition, and how is an altered state related to the ecstatic experience.

To begin with, an altered state of consciousness refers to being "'above' the more usual levels of consciousness" (Brown 1976: 195). Furthermore, being in an "altered" state of consciousness does not refer to being "unconscious". This is an important distinction to make because, unlike an unconscious person, a person in an

altered state of consciousness is aware of his surroundings, and is still susceptible to external, as well as internal, stimuli.

Now that we have a general idea of what an "altered" state refers to, we may focus on how the methods employed in reaching an altered state actually succeed in producing such a state. As has been mentioned previously, drug-induced means are not the only methods for altering consciousness. However, they are the most direct and will be addressed.

The origins of hallucinogenic chemical usage among shamanic peoples probably dates back many thousands of years, and involves many species of plants and fungi. Through a process that may only be assumed to be based on trial and error, these species were selected for ritual usage because of their effective mind-altering capabilities and because of the low health risk involved in using them.

The mind-altering effects of these plants and fungi are determined by the specific chemical compounds found in them. For example, the tobacco employed by South American Indians contains a high concentration of nicotine, "a pyridime alkaloid that occurs in aboriginal species in much higher concentrations (up to four times) than in modern cigarette tobacco" (Furst 1976: 25). Cannabis "contains more than 400 chemicals, of which the mind-altering component is tetrahydrocannabinol (THC)" (Papalia 1985: 124). The active agents in ololiuhqui, or morning glory, are found to be "closely related to d-lysergic acid diethylamide (LSD)" (Furst 1976: 65). In mushrooms, fly-agaric, and datura,

psilocybine and psilocine, ibotenic acid and muscimole, and three agents from the tropane series are the principal hallucinogenic agents respectively.

One example of a very powerful and very famous hallucinogen is peyote. What gives peyote its mind-altering strength is a chemical compound called mescaline "which is the most active of the more than thirty different alkaloids that have so far been isolated from this remarkable plant" (Furst 1976: 111).

Understanding why drugs have specific mind-altering capabilities requires a brief explanation of "neurotransmission", a fundamental, yet complicated, process whereby sensory information is relayed to various parts of the brain, thus enabling us to perceive and to respond to our environment. During this process, a neurotransmitter, such as serotonin, norepinephrine, or dopamine, is released by neurons (brain cells) across a "synaptic gap" (the gap between two neurons) where it is picked up by receptor sites on other neurons. Depending on how much or how little of a neurotransmitter is released or received determines how we perceive our environment.

When drugs are introduced into the brain, they may enhance or inhibit the neurotransmission process and, subsequently, our "perceptions, thoughts, and emotions, making them all different from the normal waking state" (Papalia 1985: 149). Hallucinogens, in particular, seem to affect the serotonin system, which plays an important role

in the process habituation, which is the brain's way of regulating sensory input (Mandell 1978: 78). Habituation enables us to quickly get used to some stimuli so that we may be ready to perceive any new or different stimuli. An increase or decrease of the serotonin levels in the brain influences the habituation process and, hence, our perceptions of our environment. For example, the mescaline found in peyote has "the unique property of retarding the onset and development of habituation by inhibiting the brain's serotonin system, allowing the brain to respond to old stimuli as if they were new. . ." (Mandell 1978: 80). The hallucinogenic effects of mescaline, as Furst notes:

include not only brilliantly colored images as well as shimmering auras that appear to surround objects in the natural world, but also auditory, gustatory, olfactory, and tactile sensations, together with feelings of weightlessness, macroscopia, and alteration of space and time perception (Furst 1976: 111).

The active hallucinogenic agents in mushrooms, psilocybine and psilocine, are, interestingly enough, "chemically-structurally related to serotonin" (Furst 1976: 88). It thus seems that, when mushrooms are ingested, an even greater concentration of serotonin is introduced into the brain, also triggering an altered state of consciousness. The reason for this may lie in what Arnold Mandell describes as the arresting of the serotonin system. When the serotonin system is repeatedly activated, a point is reached when serotonin is no longer produced (Mandell 1978: 80). This leads, subsequently, to a loss of habituation.

This arresting of the serotonin system is more closely associated with the nondrug methods for altering consciousness previously mentioned. These techniques, along with sexuality, sensory isolation, and depression, promote serotonin synthesis and, with continued repetition, may lead to serotonin synthesis arrest, a loss of habituation and an altered state of consciousness (loc cit).

As an example of this, Mendell cites the Huichol peyote hunt:

The deprivations of the Huichol peyote hunt--reduced food, water, salt, sexual activity--and the grave, sadtearfulness as part of the ritual before reaching Wirikuta, as well as the sleep deprivation and fatigue of the entire ordeal, can be argued to potentiate the action of the peyote on physiological grounds by their "teasing" of the brain's serotonin system toward lowering the threshold for the expression of religious feelings? (loc cit).

Taken in sum, the retarding or arresting of the serotonin synthesis and the resultant effect on the process of habituation appears to sensitize the shaman to every nuance of sensory stimulation. As was noted earlier, a shaman in an altered state of consciousness is not unconscious. He is fully aware of the various stimuli present in his environment, and it would appear that it is from this stimuli, and the shaman's heightened awareness of it, that the ecstatic expression is born. As Arnold Mandell states, it is the "sudden reversal of the chemical changes of habituation and the re-emergence of fresh experience" (loc cit) that marks the genuine ecstatic experience.

Science may be able to explain the physiological aspects of achieving an ecstatic trance. However, it does "not fully explain why by these processes shamans are able to reach for and discover the deep level of knowledge they do" (Bean and Vane 1978: 126). The ecstatic experience provides, as Bean and Vane note, "a psychological metaphor of immense proportions--life, death, creation, rebirth, and transformation" (Bean and Vane 1978: 124). It can provide "the well-trained shaman with an intellectual dimension which can apparently multiply his or her capacity to understand the world and its problems . . ." (loc cit).

Mandell contends that the sudden mental and physical awareness that the ecstatic experience generates promotes "the metaphysical wondering that such miracles stimulate (Mandell 1978: 80). Given what Mandell says is true, however, why do people who use hallucinogens in other cultures have different experiences? Why isn't an American teenager on LSD as creative and awe-inspired as a Huichol on peyote? As Peter Furst suggests:

It is clearly society, not chemistry, that is the variable, since the same or chemically similar drugs can function so differently in different cultural situations, or be venerated over centuries as sacred, benign, and culturally integrative in some contexts but regarded in others as inherently so evil and dangerous that their very possession constitutes a serious crime (Furst 1976: 17).

It may be that one's culture can account for the different experiences among users of the same hallucinogen. Regardless of the variable, scientific data suggests that the

ecstatic trance is, indeed, a biochemically induced one, and that the fantastic visual and auditory experiences of this trance have their origins in the brain. How the shaman gains as much meaning from these experiences as he does, however, is still yet to be understood by modern science.

Shamanic Healing

One of the chief complaints about modern medicine is that it lacks compassion. The cold professionalism of many physicians, coupled with the even colder steel of their instruments and machines, does little to offset the anxiety felt by a sick or injured person:

The practitioners of scientific medicine work with principles and facts, not beliefs. That is their strength and also their limitation because this type of healing, though often effective, is not enough. Scientific fact can never "prove" human values. It may restore the specific organ (and we are grateful for that), but it does not satisfy the individual in his quest for harmony with his surroundings and for peace of mind within (Sander 1979: 17).

In the healing process in the shamanic world, attention is focused on the state of the patient's psyche, and the diagnosis of the treatment for the patient's condition follow from an evaluation of the patient's spiritual state. The actual healing ceremony is conducted in a familiar setting, usually the patient's home, and in the presence of family, friends, and at times, the entire community. At the center of the healing ceremony is the shaman, who derives his power from a supernatural source, and who is one of the most highly regarded members of the community.

If we take an overview of the shamanic system of healing, we will note several things, each of which reflects the importance of the mind/soul in determining health or sickness. In the actual healing process itself, for example, the participation of the community in the healing ceremony and the patient's firm belief in the power of the shaman insure the effectiveness of the healing process. Among the Navajo of North America, for example,

. . . social healing has an important place. Kaplan and Johnson (1964: 228) noted that there is a reaffirmation of community solidarity which surrounds the patient with concern and good will, and places him at the very center of the social group (Sander 1979: 24-25).

by being placed at the center of the community's attention, "concern and good will," the patient receives very positive encouragement. This undoubtedly helps him toward recovery.

The patient's belief in the shaman and his power also ensures effective healing. Indeed, as David Sander notes in his book, Navaho Symbols of Healing:

The patient must share in most of the basic beliefs of the medicine man and his culture, or symbolic healing cannot work. One of the medicine men I interviewed said exactly that in his own way: 'If the patient really has confidence in me, then he gets cured. If he has no confidence in me, then that is his problem. If a person gets bitten by a snake, for example, certain prayers and songs can be used, but if the patient doesn't have enough confidence then the cure won't work.' The patient shares the responsibility for his cure." (Sander 1979: 17-18).

Looking at sickness in the shamanic world, we see that it involves mostly the psyche/spirit rather than the body. Illness, for the most part, is symbolized by the destruction of the "natural harmony between the individual and his

surroundings." (Sander 1979: 33). Not surprisingly, the cures for disease in the shamanic world are symbolic as well.

Among the Eskimos, for example, "Illness is presumably caused by violation of taboos, that is, disorder in the sacred, or by the theft of the patient's soul by one of the dead" (Eliade 1964: 298).

Among the North American tribes, Eliade notes, "Two principal kinds of diseases are distinguished; those due to the introduction of pathogenic object, and those resulting from 'soul loss'." (1964: 300). These, he states have several causes:

The flight of the patient's soul may be due to many causes: dreams that frighten it away; dead persons who are reluctant to set out for the land of shades and prowl about the camp, looking for another soul to take with them. Or, finally, the patient's soul strays far from his body of itself . . . Injurious objects are usually projected by sorcerers. They are pebbles, small animals, insects; the magician does not introduce them in concerto, but creates them by the power of his thoughts. They may also be sent by spirits, who sometimes themselves take up residence in the patient's body. Once he has discovered the cause of the illness, the shaman extracts the magical objects by suction." (Eliade 1964: 301).

The suction method is a common form of cure among the North American Indians and, like, the causes of illness among shamanic peoples, is more symbolic than concreto:

By suction, the shaman draws out with his teeth a small object "like a bit of black or white thread, sometimes like a nail paring." An Achomawi told De Angulo: "I don't believe those things come out of the sick man's body. The shaman always has them in his mouth before he starts the treatment. But he draws the sickness into them,

he uses them to catch the poison. Otherwise how could he catch it."(Eliade 1964: 307).

The shamanic world is clearly a symbolic one, one which focuses on the individual's soul/psyche rather than on his or her own body. The extent of the patient's belief in the symbols of the shamanic world appears to determine just how effective the healing process is for him or her.

May one's recovery, then, be attributed to an individual's frame of mind? May his firm belief in his culture's healing system actually aid his recovery from illness or contribute to it? Pioneering research in a new branch of medicine called behavioral immunology, and an even newer branch called psycho-neuroimmunology, may provide the answers to these questions.

The Mind and Health

Personal experience tells us that how we think often influences how we feel. As Steven F. Maier and Mark Laudenslager note in their article, "Stress and Health: Exploring the Links", "Disease and even death can follow in the wake of grief, unrequited love, financial losses, humiliation and other emotionally painful events." (Maier and Laudenslager 1985: 44).

Traditionally, the science field has regarded this as nothing but folklore. Now, however, more and more evidence is being uncovered which clearly suggests a link between the psychological state of an individual and his or her overall health. Research in the cancer field, for example, has

documented links between one's disposition and one's susceptibility to cancer: "Research at Johns Hopkins University in Baltimore found that subjects who were judged congenial were less likely to develop cancer." (Zevin 1987: 14).

As Clive Wood notes in Psychology Today, furthermore, "a research group at Stanford University has found that the degree of invasiveness of pre-cancerous changes in the cervix is influenced by the woman's mental attitude, both toward her doctors and to her own future" (Wood 1985: 10). He specifically notes that the women who took a more pessimistic view toward the world, or who were "anxious or those who saw life as threatening," were found to be more susceptible to the pre-cancerous changes than other women with less pessimistic or anxious attitudes (Wood 1985: 11).

Of one study linking pessimism with poor health, Bruce Bower writes in Science News, "The habitual ways in which people explain the bad events that befall them may put them at risk for poor physical health by middle age . . ." (1988: 54), and as Bower notes in another article, "Some of the same psychological factors associated with better survival among cancer patients are linked to stronger immune responses among homosexual men in the early stages of infection with the AIDS-causing virus (HIV) . . ." (1988: 116).

Attempts at accounting for psychologically induced illness have been made by Pirkko L. Graves of the Johns Hopkins School of Medicine, who says, "It's the lack of

balance between positive and negative emotions that's associated with illness Though the psychological side of cancer needs further probing, it seems mental and physical health may just go hand in hand." (Zevin 1987: 14). As Clive Wood notes:

Taken together, the evidence from studies of three different types of cancer strongly suggests that negative thinking can influence cancer progression. Goodkin and some other specialists think that negative emotions may have adverse effects on the body's immune surveillance, making the spread of cancer cells more likely (p.11).

The specific link between our thoughts and our health is being explored in a new branch of medicine called psychoneuroimmunology, "a term intended to call attention to the interaction of the central nervous system, the endocrine system, and immune system." (Cousins 1985: 39). This field seeks to answer the question, "How does the body convert thoughts and attitudes into biochemical relatives?" (loc cit).

Fueling the search for this answer has been the discovery that the brain secretes many different substances, such as:

endorphins and enkephalins, which contain morphine-like molecules and which are natural pain killers; interferons, anti-infectious substances that not only combat hostile bacterial agents, but are believed to have antitiral and anti-malignancy capabilities; and 'gamma globulin,' a substance that fortifies the immune system (loc cit).

Also of great interest has been the discovery that the brain has the ability to "combine these secretions in a way

that makes for a large variety of perscriptions. This function of the brain as a master apothecary is on the frontier of "medical science today." (loc cit).

Given that the mind is the complicated apothecary described in Cousin's article, how exactly can the mind translate thought into biochemical action? The answer to this is not yet known, and given the difficulty involved in studying the brain and the biochemical processes at work inside of it, this question will probably remain unanswered for many years.

Psychology and the Shamanic Patient

Shamanic healing is based on the principle of belief - belief in the shaman's power and in his ability to heal with it. This belief is reinforced by elaborate myths, ceremonies, initiations, and rituals, all of which serve to heighten a community's belief in the credibility of the shaman. Without this complete belief, however, the shaman could not heal, and the society would falter.

Because it is the patient's complete belief in the shaman that makes the healing process effective, it is easy to see why the "patient shares in the responsibility for his cure." How much responsibility the patient shares in effecting his recovery is not quite certain. However, given the evidence linking psychological factors to health, and the implications of the research being done in the fields of behavioral immunology and psychoneuroimmunology, it is very possible that the patient assumes a very large

responsibility for his cure.

Conclusion

While scientific research is useful for understanding some of the complexities of shamanism, there are limitations to the applicability of scientific principles and theories to the shamanic world. Science, as has been noted, tends to oversimplify the state of being human, breaking down existence into merely an ordered series of biological processes. Shamanism, on the other hand, maintains that existence is much more meaningful and mysterious, and considerably less empirical, than science allows. Perhaps if there is any lesson to be learned from a comparison between these views, then, it is that no world view, whether it be held by a shaman or a psychologist or a biochemist, is absolute.

The brain is much too complex an organ, and the spirit much too elusive a concept, to be entirely explained by any one particular viewpoint, regardless of whether this viewpoint is based on scientific research done in a laboratory, or the dramatic experiences of an ecstatic trance. What is needed, then, is a middleground, an integrated perspective of who and what man is, and where he fits in in this universe. Only through an integrated perspective can mankind successfully pursue the answer to the question, "Who am I?"

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